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Introduction
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The latest routine international evaluation for conformation traits took place
as scheduled at the Interbull Centre. Data from twenty five (26) countries were
included in this evaluation.

International genetic evaluations for calving traits of bulls from
Australia, Belgium, Canada, Switzerland, Czech Republic, Germany, Denmark-Finland-Sweden,
Spain, France, United Kingdom, Hungary, Ireland, Italy, Japan, Korea, The Netherlands, Norway,
New Zealand, Poland, South Africa, Estonia, Slovenia, Portugal, and United States of America were computed.
Brown Swiss, Guernsey, Holstein, Jersey  and Red Dairy Cattle breed
data were included in this evaluation.


The WHFF trait definitions are available on this link http://www.interbull.org/ib/conf_trait_hol_jer

The following is a list of substitute traits as applied by countries:


COU BRD TRT_Code    TRT_NAME      Subs_Trt
--------------------------------------
USA |BSW |ofr    |  overall frame  | sta
USA |BSW |oru    |  overall rump   | rwi
USA |BSW |rle    |  rump length    | rwi
USA |BSW |thp    |  thurl position | rwi
Changes in national procedures
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Changes in the national genetic evaluation of conformation traits are as
follows:

AUS (ALL)       Dreps in of information due to data clean up such as pedigree changes, status change of a bull which leads to a
                good number of bulls no longer qualifying. Base change for RDC.
DFS (JER)       Overall udder score is a linear combination of udder traits, and the weights have been changed. No changes in
                linear udder tratits.
EST (HOL)       Base change from cows born in years 2012-2016 to cows born in years 2014-2018.
SVN (HOL,BSW)   Reduced the performance data to 2010-2022, estimated variance components for all traits
DEA (BSW)       Base change. Bug correction causing changes in the ToP declaration for young bulls being previously wrongly assigned ToP 12
                and now corrected to 11
NOR (RDC)       Testing all conformation traits without genetic groups in the model. Also applies to ofl and ous
JPN (HOL)       Some decrease in information due to pedigree correction
ESP (HOL)       Base change for RAN and FUA. OFL:correction of a small bug affecting mainly scale of Snell transformation for this trait
NZL (ALL)       Continuous DNA parentage testing affecting daughters', herds' and EDC counts. REDC count also affected by changes in phenotype         records. Change in the conformation extraction where inspections done within 2 weeks from calving are now excluded (ICAR rule)
                causing drops in information
CHE (ALL)       Drops in information due to manual edits in database. The change of herd-year-season assignment of certain data records might
                also explain small changes in EDC and reliabilities for some bulls.
ITA (JER)       Changed the minimum number of contemporaries per group to 6 and estimated new genetic parameters and ebvs.
GBR (ALL)       Minor changes in data due re-extraction at each run and changes introduced by data providers
PRT (HOL)       Migration of system and database into a new set of programs
BEL (HOL)       Inclusion of inbreeding effect in the model
USA (BSW,GUE,JER)   Change in the weights used for the composite traits ous and ofl




INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN
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Post-processing Windows:
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According to the decision taken by ITC in Orlando (2015) to review the
post-processing windows every 5 years, during the 2020 the relative working group
has been re-activated and new windows have been identified.

As before, the upper bounds have been set to 0.99 as these were judged to have
very little effect on evaluations while the lower values have been reduced
to the 10th percentile. This reduction would provide post-processed correlations to be closer to the
real estimated ones. Over the past five years, in fact, the previous adopted lower value (25th percentile) had been found too high
causing estimated and post-processed correlations to differ significantly from each other.
The new lower values have been applied to all breeds and traits.
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The weight assigned to the magnitude of the changes tested by each country has also been revised. The new weight will allow post-processed correlations
to take more in consideration the value of the new estimated ones even when no changes are applied by the countries.
The new weights are as follows:
No changes   :: 2
Small changes:: 1
Big changes :: 0

More information can be read on https://interbull.org/ib/rg_procedure

DATA AND METHOD OF ANALYSIS

Data were national genetic evaluations of AI sampled bulls with at least
10 daughters or 10 EDC (for clinical mastitis and maternal calving traits at least
50 daughters or 50 EDC, and for direct calving traits at least 50 calvings or 50 EDC) in at
least 10 herds. Table 1 presents the amount of data included
in this Interbull evaluation for all breeds.

National proofs were first de-regressed within country and then analysed
jointly with a linear model including the effects of evaluation country,
genetic group of bull and bull merit. Heritability estimates used in both
the de-regression and international evaluation were as in each country's
national evaluation.

Table 2 presents the date of evaluation as supplied by each country

Estimated genetic parameters and sire standard deviations are shown in APPENDIX I
and the corresponding number of common bulls are listed in APPENDIX II.

SCIENTIFIC LITERATURE

The international genetic evaluation procedure is based on international work
described in the following scientific publications:

International genetic evaluation computation:
    Schaeffer. 1994. J. Dairy Sci. 77:2671-2678
    Klei, 1998. Interbull Bulletin 17:3-7

Verification and Genetic trend validation:
    Klei et al., 2002. Interbull Bulletin 29:178-182.
    Boichard et al., 1995. J. Dairy Sci. 78:431-437

Weighting factors:
    Fikse and Banos, 2001. J. Dairy Sci. 84:1759-1767

De-regression:
    Sigurdsson and G. Banos. 1995. Acta Agric. Scand. 45:207-219
    Jairath et al. 1998. J. Dairy Sci. Vol. 81:550-562

Genetic parameter estimation:
    Klei and Weigel, 1998, Interbull Bulletin 17:8-14
    Sullivan, 1999. Interbull Bulletin 22:146-148

Post-processing of estimated genetic correlations:
    Mark et al., 2003, Interbull Bulletin 30:126-135
    Jorjani et al., 2003. J. Dairy Sci. 86:677-679
    https://wiki.interbull.org/public/rG%20procedure?action=print

Time edits
    Weigel and Banos. 1997. J. Dairy Sci. 80:3425-3430

International reliability estimation
    Harris and Johnson. 1998. Interbull Bulletin 17:31-36

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NEXT ROUTINE INTERNATIONAL EVALUATION
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Dates for the next routine evaluation can be found on
http://www.interbull.org/ib/servicecalendar.

NEXT TEST INTERNATIONAL EVALUATION
-------------------------------------------------------------------------------
Dates for the next test run can be found on
http://www.interbull.org/ib/servicecalendar.


PUBLICATION OF INTERBULL ROUTINE RUN
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Results were distributed by the Interbull Centre to designated
representatives in each country. The international evaluation file comprised
international proofs expressed on the base and unit of each country included
in the analysis. Such records readily provide more information on bull
performance in various countries, thereby minimizing the need to resort to
conversions.

At the same time, all recipients of Interbull results are expected to honor
the agreed code of practice, decided by the Interbull Steering Committee,
and only publish international evaluations on their own country scale.
Evaluations expressed on another country scale are confidential and may only
be used internally for research and review purposes.


PUBLICATION OF INTERBULL TEST RUN
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Test evaluation results are meant for review purposes only and should not be
published.


^LTable 1. National evaluation data considered in the Interbull
evaluation for conformation traits (December Routine Evaluation 2022).
Number of records for stature by breed
-------------------------------------------------------------------------------------
Country      BSW        GUE        HOL        JER        RDC        SIM
-------------------------------------------------------------------------------------
AUS                      45        3888        753        246
BEL                                1668
CAN          241        102       12440        812        892
CHE         2878                   3036         49
CZE                                4342
DEA         3707
DEU                               21165                   266
DFS                               12253       2081       6417
ESP                                4302
EST                                 842
FRA          431                  17892
FRM
GBR           23        226        6358        457        333
HUN                                2818
IRL                                1865
ISR
ITA         2207                   8745         74
JPN                                6140
KOR                                1528
LTU
LVA                                1299                   608
NLD          132                  15296         47         56
NOR                                                      2489
NZL                                6852       4158        585
POL                                9116
PRT                                2140
SVK
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```
SVN          238                   549
URY
USA          919        718        33772       4453        270
ZAF                                852         554
HRV
CAM                                                        38
================================================================================
No.Records   10776      1091       179158      13438       12200
Pub. Proofs  8605       929        138808      11699       12840       0
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^LAPPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal
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------------------------------------------------------------------------------------
BSW    sta
------------------------------------------------------------------------------------

         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.34
CHE      0.95   12.44
FRA      0.98    0.96    0.92
ITA      0.96    0.95    0.95   13.97
NLD      0.95    0.95    0.96    0.92    4.11
USA      0.98    0.95    0.97    0.95    0.94    1.63
DEA      0.96    0.98    0.97    0.96    0.95    0.96   11.29
SVN      0.92    0.91    0.89    0.93    0.91    0.90    0.91   17.49
GBR      0.96    0.92    0.95    0.93    0.93    0.95    0.89    0.90    0.86


------------------------------------------------------------------------------------
BSW    cwi
------------------------------------------------------------------------------------

         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.00
CHE      0.90   10.23
FRA      0.88    0.91    0.90
ITA      0.81    0.85    0.87   21.39
NLD      0.91    0.83    0.87    0.71    4.57
USA      0.89    0.90    0.92    0.86    0.82    0.89
DEA      0.87    0.82    0.85    0.75    0.80    0.81   11.43
SVN      0.88    0.91    0.91    0.81    0.83    0.85    0.91   25.13
GBR      0.91    0.84    0.82    0.71    0.90    0.80    0.82    0.80    1.45


------------------------------------------------------------------------------------
BSW    bde
------------------------------------------------------------------------------------

         CAN     CHE     FRA     ITA     NLD     DEA     SVN     GBR     USA
CAN      6.66
CHE      0.84   10.34
FRA      0.72    0.87    0.92
ITA      0.79    0.91    0.91   17.90
NLD      0.82    0.84    0.85    0.85    4.32
DEA      0.80    0.90    0.92    0.89    0.81   11.17
SVN      0.78    0.73    0.80    0.82    0.79    0.72   25.32
GBR      0.87    0.88    0.81    0.84    0.90    0.87    0.84    1.66
USA      0.72    0.75    0.86    0.78    0.86    0.80    0.77    0.86    0.83


------------------------------------------------------------------------------------
BSW    ang
------------------------------------------------------------------------------------

         CAN     CHE     FRA     NLD     USA     GBR
CAN      8.12
CHE      0.69   11.01
FRA      0.86    0.67    0.86
NLD      0.79    0.68    0.69    3.79
USA      0.86    0.67    0.77    0.77    1.09
GBR      0.89    0.77    0.80    0.82    0.90    0.75


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BSW    ran
------------------------------------------------------------------------------------
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--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN     6.90
CHE     0.93   10.68
FRA     0.97    0.96    0.95
ITA     0.94    0.93    0.94   23.04
NLD     0.95    0.92    0.96    0.92    4.56
USA     0.97    0.94    0.97    0.91    0.95    1.35
DEA     0.96    0.94    0.95    0.94    0.92    0.97   11.84
SVN     0.91    0.88    0.89    0.89    0.90    0.90    0.88   23.25
GBR     0.96    0.94    0.97    0.94    0.96    0.96    0.91    0.92    2.01

--------------------------------------------------------------------------------
BSW    rwi
--------------------------------------------------------------------------------
        CAN     CHE     FRA     NLD     USA     DEA     GBR     SVN     ITA
CAN     6.92
CHE     0.89   10.27
FRA     0.96    0.86    0.98
NLD     0.93    0.85    0.93    4.03
USA     0.91    0.85    0.87    0.80    0.97
DEA     0.91    0.89    0.93    0.78    0.89   13.33
GBR     0.93    0.85    0.92    0.88    0.93    0.82    1.36
SVN     0.89    0.80    0.94    0.86    0.82    0.90    0.86   25.80
ITA     0.88    0.79    0.90    0.79    0.86    0.87    0.88    0.89   19.34

--------------------------------------------------------------------------------
BSW    rls
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN     7.68
CHE     0.92   13.07
FRA     0.91    0.92    1.02
ITA     0.91    0.86    0.93   23.67
NLD     0.88    0.84    0.88    0.84    5.09
USA     0.95    0.93    0.90    0.87    0.86    0.81
DEA     0.91    0.91    0.92    0.89    0.81    0.90   12.23
SVN     0.85    0.79    0.88    0.81    0.80    0.83    0.87   22.49
GBR     0.85    0.86    0.90    0.83    0.86    0.83    0.87    0.80    1.43

--------------------------------------------------------------------------------
BSW    fan
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN     9.03
CHE     0.68   14.03
FRA     0.79    0.72    1.11
ITA     0.69    0.84    0.80   21.54
NLD     0.74    0.68    0.83    0.70    5.02
USA     0.82    0.72    0.84    0.85    0.81    0.85
DEA     0.62    0.90    0.66    0.89    0.63    0.65   11.59
SVN     0.71    0.76    0.71    0.79    0.67    0.71    0.83   25.50
GBR     0.81    0.73    0.90    0.74    0.88    0.83    0.67    0.77    1.30

--------------------------------------------------------------------------------
BSW    hde
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     DEA     SVN     USA
CAN     8.21
CHE     0.87   12.69
FRA     0.84    0.81    1.18
ITA     0.80    0.84    0.85   21.40
NLD     0.77    0.74    0.83    0.74    5.02
DEA     0.79    0.88    0.86    0.93    0.76   12.15
SVN     0.80    0.81    0.86    0.89    0.74    0.90   32.40
USA     0.85    0.73    0.85    0.89    0.81    0.78    0.82    0.85

--------------------------------------------------------------------------------
BSW    fua
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----------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.78
CHE      0.87   12.13
FRA      0.89    0.86    0.88
ITA      0.88    0.84    0.85   19.97
NLD      0.90    0.85    0.90    0.84    4.64
USA      0.94    0.86    0.86    0.93    0.87    1.28
DEA      0.83    0.85    0.93    0.83    0.80    0.83   11.12
SVN      0.73    0.75    0.82    0.82    0.77    0.73    0.90   23.08
GBR      0.91    0.84    0.88    0.87    0.91    0.91    0.74    0.62    1.31

----------------------------------------------------------------------------
BSW    ruh
----------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      7.54
CHE      0.92   12.01
FRA      0.85    0.83    0.92
ITA      0.74    0.84    0.86   12.96
NLD      0.77    0.83    0.87    0.85    4.31
USA      0.83    0.81    0.87    0.86    0.88    1.07
DEA      0.82    0.85    0.90    0.92    0.88    0.83   11.74
SVN      0.80    0.82    0.80    0.86    0.88    0.84    0.87   21.85
GBR      0.73    0.80    0.86    0.82    0.87    0.91    0.76    0.79    1.73

----------------------------------------------------------------------------
BSW    ruw
----------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN
CAN      8.07
CHE      0.91   12.01
FRA      0.85    0.86    0.86
ITA      0.78    0.89    0.79   13.31
NLD      0.69    0.66    0.80    0.69    4.31
USA      0.86    0.90    0.85    0.89    0.79    1.01
DEA      0.85    0.91    0.76    0.95    0.55    0.90   12.20
SVN      0.84    0.86    0.80    0.80    0.69    0.83    0.80   21.17

----------------------------------------------------------------------------
BSW    usu
----------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.40
CHE      0.90   12.02
FRA      0.82    0.91    0.90
ITA      0.88    0.90    0.87   19.09
NLD      0.83    0.83    0.89    0.81    4.14
USA      0.83    0.89    0.87    0.87    0.90    0.99
DEA      0.92    0.92    0.88    0.93    0.78    0.84   11.49
SVN      0.81    0.77    0.62    0.74    0.65    0.70    0.78   21.07
GBR      0.80    0.80    0.86    0.86    0.91    0.92    0.73    0.63    2.83

----------------------------------------------------------------------------
BSW    ude
----------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.63
CHE      0.96   12.16
FRA      0.96    0.95    0.98
ITA      0.94    0.96    0.96   20.18
NLD      0.95    0.94    0.95    0.93    4.03
USA      0.96    0.95    0.96    0.95    0.95    1.23
DEA      0.92    0.97    0.93    0.97    0.93    0.93   12.08
SVN      0.92    0.95    0.92    0.96    0.94    0.92    0.96   23.79
GBR      0.96    0.94    0.96    0.94    0.96    0.96    0.90    0.93    2.06

----------------------------------------------------------------------------
BSW    ftp
```

	CAN	CHE	FRA	NLD	USA	DEA	SVN	GBR	ITA
CAN	7.33								
CHE	0.97	13.97							
FRA	0.97	0.95	0.92						
NLD	0.96	0.95	0.95	5.17					
USA	0.92	0.91	0.88	0.91	1.31				
DEA	0.95	0.98	0.95	0.96	0.90	11.07			
SVN	0.93	0.93	0.92	0.93	0.91	0.94	19.18		
GBR	0.95	0.93	0.89	0.94	0.94	0.92	0.93	1.40	
ITA	0.87	0.86	0.86	0.86	0.88	0.86	0.87	0.87	21.41

BSW   ftl

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	6.43								
CHE	0.90	14.71							
FRA	0.95	0.95	0.96						
ITA	0.93	0.94	0.95	18.30					
NLD	0.92	0.96	0.92	0.92	5.01				
USA	0.93	0.96	0.95	0.93	0.96	1.75			
DEA	0.90	0.98	0.97	0.96	0.94	0.96	11.11		
SVN	0.90	0.93	0.90	0.92	0.94	0.90	0.93	18.98	
GBR	0.95	0.94	0.93	0.94	0.97	0.96	0.92	0.93	1.45

BSW   rtp

	CAN	CHE	FRA	ITA	NLD	DEA	SVN	USA
CAN	6.60							
CHE	0.98	14.53						
FRA	0.97	0.97	0.92					
ITA	0.92	0.95	0.93	20.32				
NLD	0.97	0.96	0.97	0.92	4.65			
DEA	0.97	0.99	0.97	0.96	0.94	12.00		
SVN	0.94	0.93	0.93	0.94	0.94	0.93	18.68	
USA	0.91	0.88	0.91	0.89	0.94	0.87	0.89	1.31

BSW   ocs

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.54								
CHE	0.81	9.28							
FRA	0.74	0.84	0.93						
ITA	0.78	0.81	0.89	9.09					
NLD	0.72	0.71	0.77	0.71	3.59				
USA	0.81	0.75	0.83	0.81	0.81	0.51			
DEA	0.81	0.90	0.89	0.89	0.62	0.74	10.61		
SVN	0.59	0.61	0.68	0.63	0.64	0.61	0.73	20.45	
GBR	0.75	0.83	0.84	0.79	0.86	0.86	0.71	0.68	1.73

BSW   ous

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.96								
CHE	0.87	13.82							
FRA	0.88	0.90	0.93						
ITA	0.81	0.88	0.91	10.29					
NLD	0.88	0.86	0.91	0.79	4.58				
USA	0.89	0.81	0.83	0.79	0.85	0.79			
DEA	0.86	0.95	0.90	0.91	0.83	0.78	12.39		
SVN	0.75	0.85	0.78	0.82	0.75	0.72	0.92	20.73	
GBR	0.77	0.84	0.75	0.80	0.77	0.86	0.75	0.73	1.57

BSW   ofl

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----------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN      8.35
CHE      0.83    11.66
FRA      0.64     0.66     1.25
ITA      0.62     0.70     0.85    17.35
NLD      0.65     0.64     0.73     0.63     4.26
USA      0.59     0.62     0.66     0.67     0.65     0.83
DEA      0.69     0.85     0.70     0.81     0.59     0.57    11.26
SVN      0.72     0.85     0.66     0.70     0.65     0.66     0.89    27.27
GBR      0.66     0.75     0.81     0.66     0.73     0.71     0.65     0.62     1.51

----------------------------------------------------------------------------------
BSW    ofr
----------------------------------------------------------------------------------
          CAN      CHE      DEA      ITA      SVN      USA      FRA
CAN      6.92
CHE      0.80    12.06
DEA      0.81     0.90    11.51
ITA      0.78     0.91     0.94    17.13
SVN      0.73     0.78     0.79     0.79    23.52
USA      0.77     0.83     0.91     0.86     0.74     1.63
FRA      0.75     0.87     0.93     0.91     0.79     0.89     0.89

----------------------------------------------------------------------------------
BSW    tpl
----------------------------------------------------------------------------------
          CAN      CHE      DEA      ITA      SVN      FRA
CAN      6.73
CHE      0.88    12.17
DEA      0.90     0.90    11.72
ITA      0.91     0.91     0.93    23.79
SVN      0.88     0.86     0.84     0.85    24.89
FRA      0.96     0.93     0.90     0.90     0.86     1.28

----------------------------------------------------------------------------------
BSW    oru
----------------------------------------------------------------------------------
          CAN      CHE      DEA      ITA      SVN      USA      FRA
CAN      7.05
CHE      0.75    16.37
DEA      0.70     0.87    12.59
ITA      0.92     0.76     0.76    17.34
SVN      0.82     0.59     0.70     0.75    27.43
USA      0.89     0.58     0.49     0.83     0.68     0.97
FRA      0.90     0.88     0.86     0.89     0.74     0.85     1.11

----------------------------------------------------------------------------------
BSW    rle
----------------------------------------------------------------------------------
          CHE      DEA      ITA      SVN      USA      FRA
CHE     11.77
DEA      0.95    12.31
ITA      0.83     0.86    19.58
SVN      0.80     0.81     0.83    24.83
USA      0.55     0.51     0.77     0.70     0.97
FRA      0.92     0.94     0.88     0.80     0.74     1.02

----------------------------------------------------------------------------------
BSW    thp
----------------------------------------------------------------------------------
          CAN      CHE      DEA      ITA      SVN      USA      FRA
CAN      7.37
CHE      0.82    11.34
DEA      0.77     0.84    12.14
ITA      0.87     0.90     0.85    30.06
SVN      0.79     0.85     0.85     0.89    36.17
USA      0.87     0.87     0.71     0.83     0.71     1.35
FRA      0.89     0.83     0.86     0.85     0.82     0.79     1.05
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------------------------------------------------------------------------------------
BSW    hoq
------------------------------------------------------------------------------------
          CAN     CHE     DEA     ITA     SVN     FRA
CAN      7.08
CHE      0.92   12.09
DEA      0.91    0.89   12.52
ITA      0.91    0.83    0.85   19.61
SVN      0.95    0.88    0.90    0.91   21.96
FRA      0.91    0.85    0.88    0.88    0.88    1.03


------------------------------------------------------------------------------------
BSW    ful
------------------------------------------------------------------------------------
          CHE     DEA     ITA     SVN     FRA
CHE     11.78
DEA      0.91   12.30
ITA      0.92    0.95   12.85
SVN      0.83    0.90    0.86   21.71
FRA      0.74    0.82    0.75    0.74    0.93


------------------------------------------------------------------------------------
BSW    udb
------------------------------------------------------------------------------------
          CHE     DEA     ITA     SVN     FRA
CHE     12.21
DEA      0.97   13.29
ITA      0.93    0.96   26.56
SVN      0.84    0.86    0.85   25.25
FRA      0.91    0.87    0.85    0.80    0.96

------------------------------------------------------------------------------------
BSW    tdi
------------------------------------------------------------------------------------
          CHE     DEA     ITA     SVN     FRA
CHE     15.78
DEA      0.96   11.36
ITA      0.94    0.95   20.59
SVN      0.90    0.94    0.92   18.96
FRA      0.96    0.97    0.91    0.91    0.90


------------------------------------------------------------------------------------
BSW    tth
------------------------------------------------------------------------------------
          CHE     DEA     ITA     SVN     FRA
CHE     14.49
DEA      0.98   13.03
ITA      0.94    0.95   23.28
SVN      0.88    0.88    0.88   21.22
FRA      0.93    0.93    0.94    0.88    0.89

------------------------------------------------------------------------------------
GUE    sta
------------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN      6.48
GBR      0.97    1.20
USA      0.98    0.96    2.76
AUS      0.90    0.93    0.91    0.84


------------------------------------------------------------------------------------
GUE    cwi
------------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN      6.84
GBR      0.92    1.74
USA      0.85    0.85    1.52
AUS      0.72    0.80    0.66    0.34
```

```
--------------------------------------------------------------------------------
GUE     bde
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       6.31
GBR       0.87    1.52
USA       0.75    0.89    1.75
AUS       0.80    0.77    0.70    0.45

--------------------------------------------------------------------------------
GUE     ang
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       7.90
GBR       0.89    1.70
USA       0.88    0.91    1.86
AUS       0.65    0.76    0.68    0.39

--------------------------------------------------------------------------------
GUE     ran
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       6.33
GBR       0.97    1.66
USA       0.97    0.97    1.99
AUS       0.90    0.93    0.90    0.76

--------------------------------------------------------------------------------
GUE     rwi
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       6.88
GBR       0.93    1.52
USA       0.92    0.92    1.71
AUS       0.85    0.84    0.78    0.64

--------------------------------------------------------------------------------
GUE     rls
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       8.51
GBR       0.82    1.82
USA       0.93    0.81    0.89
AUS       0.71    0.79    0.70    0.32

--------------------------------------------------------------------------------
GUE     rlr
--------------------------------------------------------------------------------
          CAN     USA     AUS
CAN       7.02
USA       0.85    0.91
AUS       0.61    0.54    0.19

--------------------------------------------------------------------------------
GUE     fan
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       8.53
GBR       0.80    1.69
USA       0.84    0.76    0.86
AUS       0.62    0.76    0.65    0.26

--------------------------------------------------------------------------------
GUE     fua
--------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN       7.38
GBR       0.94    1.55
```

```
USA        0.92    0.91    1.82
AUS        0.79    0.78    0.77    0.38

-------------------------------------------------------------------------------
GUE    ruh
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        6.92
GBR        0.73    2.05
USA        0.80    0.90    1.45
AUS        0.76    0.77    0.76    0.36

-------------------------------------------------------------------------------
GUE    usu
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        6.76
GBR        0.79    1.68
USA        0.80    0.87    1.35
AUS        0.76    0.78    0.75    0.29

-------------------------------------------------------------------------------
GUE    ude
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        6.09
GBR        0.97    1.48
USA        0.95    0.95    1.84
AUS        0.89    0.89    0.88    0.53

-------------------------------------------------------------------------------
GUE    ftp
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        5.97
GBR        0.96    1.29
USA        0.92    0.92    1.60
AUS        0.92    0.91    0.87    0.40

-------------------------------------------------------------------------------
GUE    ftl
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        4.70
GBR        0.95    1.87
USA        0.94    0.97    2.01
AUS        0.93    0.94    0.93    0.95

-------------------------------------------------------------------------------
GUE    rtp
-------------------------------------------------------------------------------
           CAN     AUS     USA
CAN        5.45
AUS        0.89    0.35
USA        0.93    0.88    1.60

-------------------------------------------------------------------------------
GUE    ocs
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        8.16
GBR        0.78    2.11
USA        0.74    0.86    0.87
AUS        0.58    0.63    0.57    0.83

-------------------------------------------------------------------------------
GUE    ous
-------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
```

```
CAN      8.06
GBR      0.78    1.53
USA      0.87    0.82    0.82
AUS      0.69    0.82    0.73    1.07
```

GUE   ofl

	CAN	GBR	USA	AUS
CAN	7.48			
GBR	0.68	1.49		
USA	0.64	0.67	0.83	
AUS	0.41	0.53	0.50	0.59

HOL   sta

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.64																							
BEL	0.89	1.07																						
CAN	0.89	0.94	5.30																					
CHE	0.89	0.91	0.96	10.70																				
DEU	0.89	0.92	0.98	0.97	12.89																			
DFS	0.87	0.95	0.97	0.96	0.97	10.72																		
ESP	0.89	0.94	0.98	0.97	0.98	0.97	0.83																	
FRA	0.90	0.96	0.98	0.97	0.97	0.97	0.98	1.06																
GBR	0.93	0.92	0.97	0.95	0.96	0.94	0.96	0.97	1.09															
ITA	0.88	0.88	0.95	0.93	0.94	0.94	0.95	0.95	0.95	1.08														
NLD	0.87	0.93	0.96	0.97	0.98	0.97	0.97	0.97	0.94	0.92	4.14													
USA	0.90	0.92	0.98	0.94	0.96	0.94	0.96	0.96	0.97	0.94	0.93	1.20												
HUN	0.89	0.92	0.96	0.93	0.95	0.92	0.96	0.96	0.95	0.93	0.93	0.94	0.91											
POL	0.84	0.87	0.92	0.90	0.93	0.90	0.93	0.92	0.90	0.90	0.91	0.89	0.91	9.89										
NZL	0.88	0.85	0.83	0.84	0.83	0.83	0.83	0.87	0.89	0.83	0.83	0.86	0.84	0.83	0.43									
ZAF	0.90	0.91	0.91	0.88	0.89	0.87	0.89	0.91	0.93	0.85	0.86	0.91	0.88	0.86	0.88	0.73								
JPN	0.89	0.95	0.98	0.97	0.97	0.97	0.98	0.98	0.96	0.95	0.96	0.97	0.95	0.92	0.86	0.90	1.20							
CZE	0.89	0.94	0.97	0.94	0.97	0.95	0.96	0.96	0.95	0.92	0.95	0.95	0.96	0.92	0.84	0.92	0.96	13.01						
EST	0.87	0.92	0.94	0.93	0.95	0.95	0.94	0.95	0.93	0.94	0.96	0.91	0.94	0.92	0.85	0.88	0.95	0.96	14.86					
IRL	0.89	0.88	0.92	0.91	0.91	0.88	0.92	0.93	0.97	0.91	0.89	0.93	0.91	0.86	0.87	0.90	0.91	0.93	0.88	0.71				
KOR	0.84	0.84	0.86	0.84	0.84	0.84	0.84	0.86	0.86	0.83	0.84	0.84	0.85	0.84	0.83	0.84	0.85	0.86	0.85	0.84	4.46			
SVN	0.89	0.91	0.95	0.95	0.96	0.96	0.96	0.94	0.93	0.92	0.96	0.93	0.90	0.94	0.84	0.85	0.95	0.94	0.93	0.88	0.84	15.89		
PRT	0.87	0.90	0.94	0.91	0.95	0.93	0.94	0.94	0.94	0.91	0.91	0.92	0.93	0.89	0.83	0.86	0.94	0.94	0.91	0.90	0.83	0.91	1.18	
LVA	0.84	0.83	0.83	0.84	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.83	0.83	0.84	0.84	0.83	0.84	0.83	0.42

HOL   cwi

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.41																							
BEL	0.67	1.69																						
CAN	0.73	0.85	6.35																					
CHE	0.65	0.85	0.90	11.08																				
DEU	0.69	0.88	0.90	0.84	12.43																			
DFS	0.71	0.87	0.92	0.84	0.94	12.66																		
ESP	0.67	0.88	0.91	0.87	0.82	0.85	1.07																	
FRA	0.64	0.91	0.84	0.92	0.86	0.83	0.85	1.14																
GBR	0.82	0.85	0.92	0.85	0.90	0.89	0.85	0.82	1.45															
ITA	0.64	0.79	0.75	0.81	0.69	0.66	0.81	0.88	0.69	1.24														
NLD	0.72	0.87	0.92	0.87	0.94	0.91	0.85	0.86	0.91	0.71	5.02													
USA	0.64	0.83	0.85	0.87	0.81	0.80	0.85	0.92	0.79	0.91	0.81	1.25												
HUN	0.64	0.83	0.86	0.84	0.84	0.84	0.83	0.89	0.78	0.81	0.81	0.88	1.14											
POL	0.64	0.89	0.87	0.83	0.86	0.86	0.87	0.86	0.83	0.78	0.84	0.82	0.83	12.41										
NZL	0.78	0.64	0.71	0.66	0.69	0.70	0.71	0.65	0.79	0.63	0.68	0.68	0.63	0.64	0.38									
ZAF	0.67	0.89	0.83	0.86	0.85	0.85	0.86	0.87	0.89	0.74	0.85	0.87	0.83	0.83	0.70	0.83								
JPN	0.63	0.83	0.76	0.83	0.72	0.72	0.81	0.91	0.67	0.92	0.72	0.91	0.84	0.75	0.63	0.77	1.53							
CZE	0.71	0.91	0.92	0.85	0.92	0.91	0.90	0.85	0.88	0.77	0.89	0.85	0.87	0.89	0.70	0.87	0.78	14.19						
EST	0.74	0.76	0.84	0.75	0.77	0.82	0.80	0.69	0.80	0.63	0.82	0.65	0.65	0.72	0.66	0.70	0.64	0.77	23.24					
IRL	0.79	0.76	0.83	0.78	0.85	0.81	0.73	0.76	0.93	0.64	0.83	0.73	0.73	0.74	0.82	0.82	0.63	0.82	0.73	1.33				
KOR	0.64	0.73	0.63	0.64	0.72	0.71	0.70	0.73	0.65	0.66	0.64	0.71	0.72	0.64	0.66	0.67	0.71	0.75	0.64	0.64	2.53			
SVN	0.66	0.83	0.84	0.80	0.88	0.91	0.82	0.81	0.79	0.66	0.87	0.76	0.85	0.79	0.63	0.78	0.70	0.85	0.73	0.70	0.69	23.77		

```
PRT      0.65    0.82    0.81    0.79    0.86    0.83    0.81    0.83    0.80    0.75    0.84    0.83    0.86    0.84    0.63    0.78    0.76    0.85    0.64    0.74    0.69    0.77    2.04
LVA      0.63    0.72    0.67    0.75    0.68    0.71    0.63    0.70    0.64    0.63    0.70    0.65    0.64    0.67    0.63    0.63    0.64    0.68    0.70    0.63    0.64    0.70    0.66    0.36
```

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HOL    bde
----------------------------------------------------------------------------------
         AUS     BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD     USA     HUN     POL     NZL     ZAF     JPN     CZE     EST     IRL     KOR     PRT     SVN     LVA
AUS      0.53
BEL      0.68    1.40
CAN      0.82    0.77    5.41
CHE      0.71    0.91    0.87   11.30
DEU      0.74    0.92    0.88    0.91   11.68
DFS      0.80    0.85    0.92    0.88    0.94   11.75
ESP      0.74    0.90    0.89    0.92    0.91    0.90    0.97
FRA      0.68    0.92    0.68    0.87    0.83    0.74    0.83    1.07
GBR      0.77    0.90    0.88    0.91    0.92    0.91    0.92    0.81    1.34
ITA      0.68    0.88    0.71    0.85    0.86    0.78    0.86    0.90    0.86    1.20
NLD      0.69    0.88    0.83    0.92    0.91    0.85    0.91    0.86    0.91    0.88    4.76
USA      0.68    0.92    0.74    0.89    0.89    0.81    0.89    0.92    0.87    0.92    0.91    1.15
HUN      0.69    0.89    0.81    0.88    0.90    0.86    0.91    0.83    0.89    0.84    0.85    0.89    1.05
POL      0.75    0.82    0.85    0.83    0.92    0.90    0.87    0.71    0.88    0.80    0.83    0.81    0.87   12.45
NZL      0.77    0.68    0.68    0.68    0.68    0.69    0.68    0.68    0.68    0.68    0.68    0.68    0.68    0.71    0.38
ZAF      0.73    0.87    0.83    0.83    0.87    0.86    0.88    0.75    0.91    0.75    0.82    0.84    0.84    0.86    0.68    0.87
JPN      0.68    0.94    0.74    0.90    0.91    0.82    0.89    0.95    0.86    0.90    0.91    0.95    0.88    0.79    0.68    0.80    1.37
CZE      0.79    0.82    0.93    0.84    0.93    0.92    0.88    0.69    0.90    0.77    0.83    0.80    0.88    0.92    0.69    0.86    0.79   15.37
EST      0.76    0.80    0.91    0.86    0.88    0.90    0.88    0.73    0.87    0.75    0.84    0.80    0.84    0.85    0.64    0.77    0.81    0.88   17.97
IRL      0.79    0.84    0.84    0.88    0.88    0.89    0.87    0.75    0.94    0.81    0.86    0.82    0.82    0.85    0.73    0.87    0.80    0.86    0.79    1.16
KOR      0.68    0.81    0.70    0.79    0.84    0.83    0.79    0.77    0.75    0.69    0.72    0.75    0.79    0.73    0.67    0.74    0.81    0.78    0.72    0.73    3.26
PRT      0.76    0.80    0.80    0.79    0.89    0.86    0.83    0.69    0.86    0.77    0.78    0.79    0.85    0.87    0.71    0.82    0.80    0.87    0.77    0.85    0.71    1.96
SVN      0.73    0.88    0.84    0.88    0.90    0.88    0.92    0.84    0.88    0.84    0.92    0.86    0.85    0.85    0.66    0.78    0.87    0.84    0.84    0.84    0.76    0.75   19.45
LVA      0.72    0.70    0.78    0.76    0.79    0.81    0.72    0.67    0.77    0.68    0.70    0.68    0.78    0.78    0.67    0.69    0.68    0.83    0.72    0.76    0.76    0.78    0.68    0.33
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HOL    ang
----------------------------------------------------------------------------------
         AUS     BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD     USA     HUN     POL     ZAF     JPN     CZE     EST     IRL     KOR     PRT     SVN     LVA
AUS      0.43
BEL      0.60    1.14
CAN      0.65    0.75    6.60
CHE      0.60    0.77    0.87   11.42
DEU      0.62    0.66    0.71    0.68   12.76
DFS      0.68    0.85    0.89    0.81    0.71   10.42
ESP      0.64    0.76    0.86    0.78    0.66    0.84    0.73
FRA      0.62    0.83    0.88    0.85    0.68    0.86    0.81    0.93
GBR      0.77    0.75    0.91    0.79    0.69    0.87    0.81    0.80    1.52
ITA      0.66    0.73    0.89    0.80    0.68    0.84    0.87    0.81    0.84    1.26
NLD      0.71    0.61    0.82    0.75    0.60    0.72    0.78    0.68    0.82    0.78    4.47
USA      0.67    0.76    0.92    0.80    0.73    0.90    0.83    0.83    0.90    0.84    0.74    1.37
HUN      0.60    0.71    0.76    0.71    0.71    0.78    0.70    0.80    0.72    0.73    0.60    0.79    1.02
POL      0.60    0.67    0.69    0.67    0.61    0.73    0.77    0.70    0.66    0.80    0.65    0.68    0.60   10.05
ZAF      0.63    0.81    0.71    0.68    0.69    0.79    0.69    0.74    0.85    0.73    0.61    0.76    0.78    0.63    0.72
JPN      0.66    0.80    0.90    0.81    0.71    0.90    0.87    0.84    0.87    0.90    0.78    0.88    0.77    0.77    0.77    1.43
CZE      0.66    0.78    0.81    0.75    0.68    0.85    0.74    0.76    0.76    0.77    0.64    0.77    0.81    0.63    0.68    0.80   14.17
EST      0.63    0.80    0.62    0.63    0.65    0.78    0.62    0.67    0.64    0.62    0.61    0.61    0.76    0.62    0.76    0.70    0.70   24.37
IRL      0.72    0.72    0.86    0.74    0.70    0.82    0.79    0.80    0.92    0.81    0.73    0.87    0.72    0.64    0.80    0.85    0.76    0.62    0.72
KOR      0.68    0.77    0.79    0.73    0.67    0.74    0.76    0.75    0.80    0.75    0.66    0.78    0.77    0.65    0.77    0.84    0.71    0.70    0.76    2.23
PRT      0.60    0.69    0.77    0.65    0.69    0.79    0.74    0.73    0.78    0.77    0.60    0.80    0.71    0.65    0.70    0.81    0.72    0.62    0.75    0.77    1.17
SVN      0.62    0.64    0.65    0.64    0.61    0.64    0.67    0.61    0.62    0.70    0.66    0.61    0.62    0.81    0.62    0.64    0.61    0.65    0.62    0.72    0.61   20.34
LVA      0.61    0.61    0.61    0.61    0.61    0.61    0.60    0.61    0.61    0.60    0.61    0.60    0.61    0.60    0.62    0.61    0.61    0.62    0.61    0.61    0.61    0.62    0.33
```

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HOL    ran
----------------------------------------------------------------------------------
         AUS     BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD     USA     HUN     POL     NZL     ZAF     JPN     CZE     EST     IRL     KOR     SVN     PRT     LVA
AUS      0.63
BEL      0.94    1.45
CAN      0.90    0.97    6.04
CHE      0.92    0.96    0.96   11.34
DEU      0.92    0.97    0.98    0.95   12.21
```

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
DFS	0.91	0.98	0.98	0.96	0.98	11.58																		
ESP	0.91	0.97	0.98	0.97	0.97	0.96	1.14																	
FRA	0.95	0.98	0.97	0.97	0.97	0.96	0.97	1.07																
GBR	0.93	0.96	0.97	0.95	0.97	0.95	0.96	0.98	1.41															
ITA	0.88	0.95	0.95	0.93	0.96	0.94	0.95	0.95	0.95	1.43														
NLD	0.91	0.96	0.97	0.95	0.98	0.96	0.97	0.94	0.97	0.94	5.05													
USA	0.90	0.95	0.97	0.95	0.97	0.96	0.96	0.96	0.97	0.93	0.96	1.45												
HUN	0.91	0.97	0.95	0.95	0.97	0.96	0.97	0.97	0.95	0.95	0.95	0.94	1.05											
POL	0.89	0.96	0.96	0.94	0.96	0.96	0.96	0.95	0.94	0.95	0.95	0.92	0.95	11.23										
NZL	0.94	0.89	0.88	0.89	0.88	0.87	0.87	0.93	0.93	0.87	0.88	0.89	0.88	0.87	0.34									
ZAF	0.95	0.95	0.92	0.91	0.92	0.92	0.93	0.94	0.93	0.88	0.93	0.92	0.94	0.88	0.89	0.88								
JPN	0.88	0.95	0.97	0.96	0.96	0.96	0.96	0.94	0.92	0.93	0.94	0.94	0.95	0.95	0.86	0.88	1.44							
CZE	0.88	0.95	0.96	0.92	0.97	0.95	0.95	0.94	0.96	0.94	0.96	0.97	0.95	0.94	0.87	0.90	0.93	14.54						
EST	0.87	0.92	0.93	0.89	0.95	0.93	0.92	0.91	0.92	0.91	0.95	0.92	0.90	0.94	0.84	0.87	0.92	0.93	18.64					
IRL	0.93	0.92	0.92	0.93	0.94	0.90	0.91	0.95	0.98	0.92	0.94	0.94	0.90	0.89	0.94	0.90	0.88	0.91	0.88	1.78				
KOR	0.87	0.89	0.88	0.88	0.88	0.88	0.90	0.88	0.87	0.88	0.88	0.88	0.88	0.88	0.87	0.87	0.89	0.87	0.86	0.87	4.75			
SVN	0.89	0.96	0.95	0.93	0.95	0.96	0.94	0.95	0.93	0.93	0.94	0.92	0.92	0.94	0.87	0.88	0.95	0.92	0.89	0.89	0.88	18.31		
PRT	0.87	0.92	0.92	0.90	0.94	0.92	0.94	0.93	0.93	0.92	0.93	0.93	0.93	0.91	0.87	0.87	0.90	0.93	0.89	0.90	0.87	0.92	1.77	
LVA	0.87	0.93	0.94	0.92	0.94	0.94	0.93	0.92	0.91	0.91	0.92	0.91	0.93	0.93	0.86	0.87	0.95	0.91	0.90	0.89	0.88	0.90	0.89	0.46

HOL   rwi

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	PRT	SVN	LVA
AUS	0.52																							
BEL	0.84	1.44																						
CAN	0.87	0.95	5.69																					
CHE	0.86	0.95	0.93	11.11																				
DEU	0.81	0.93	0.95	0.90	11.41																			
DFS	0.81	0.92	0.95	0.89	0.97	12.40																		
ESP	0.89	0.93	0.97	0.91	0.95	0.94	1.00																	
FRA	0.86	0.97	0.97	0.93	0.95	0.95	0.95	1.11																
GBR	0.85	0.91	0.94	0.87	0.90	0.91	0.92	0.93	1.32															
ITA	0.77	0.84	0.88	0.81	0.85	0.84	0.88	0.89	0.89	1.30														
NLD	0.85	0.95	0.95	0.93	0.96	0.93	0.94	0.95	0.89	0.80	4.81													
USA	0.77	0.85	0.92	0.80	0.85	0.87	0.88	0.89	0.94	0.89	0.81	1.28												
HUN	0.78	0.92	0.92	0.85	0.93	0.91	0.90	0.93	0.90	0.89	0.90	0.88	1.02											
POL	0.81	0.91	0.92	0.89	0.90	0.90	0.90	0.91	0.87	0.86	0.88	0.82	0.91	11.26										
NZL	0.84	0.84	0.87	0.79	0.81	0.80	0.86	0.85	0.87	0.80	0.83	0.82	0.81	0.76	0.31									
ZAF	0.77	0.82	0.85	0.77	0.85	0.84	0.81	0.83	0.91	0.80	0.79	0.87	0.85	0.79	0.79	0.89								
JPN	0.82	0.95	0.96	0.94	0.94	0.94	0.94	0.97	0.93	0.90	0.93	0.90	0.94	0.92	0.84	0.85	1.33							
CZE	0.81	0.92	0.95	0.88	0.96	0.93	0.94	0.93	0.90	0.87	0.93	0.87	0.92	0.90	0.84	0.82	0.93	14.83						
EST	0.79	0.91	0.90	0.91	0.92	0.86	0.90	0.89	0.84	0.82	0.92	0.77	0.88	0.91	0.79	0.77	0.89	0.90	16.27					
IRL	0.77	0.77	0.80	0.77	0.79	0.78	0.77	0.78	0.88	0.77	0.77	0.85	0.78	0.77	0.79	0.78	0.79	0.79	0.77	1.57				
KOR	0.77	0.84	0.81	0.80	0.80	0.79	0.78	0.83	0.77	0.77	0.79	0.77	0.83	0.77	0.77	0.77	0.82	0.78	0.78	0.77	3.22			
PRT	0.78	0.86	0.88	0.80	0.89	0.90	0.87	0.87	0.85	0.84	0.82	0.85	0.88	0.85	0.76	0.83	0.87	0.87	0.77	0.77	0.77	1.66		
SVN	0.81	0.91	0.94	0.91	0.93	0.94	0.93	0.92	0.89	0.82	0.93	0.85	0.90	0.92	0.77	0.82	0.93	0.93	0.89	0.78	0.79	0.84	20.64	
LVA	0.77	0.81	0.79	0.77	0.82	0.85	0.79	0.80	0.76	0.76	0.79	0.76	0.80	0.79	0.77	0.77	0.79	0.82	0.80	0.76	0.77	0.76	0.81	0.42

HOL   rls

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.30																							
BEL	0.77	1.79																						
CAN	0.71	0.95	6.09																					
CHE	0.78	0.92	0.93	11.78																				
DEU	0.72	0.94	0.95	0.92	11.95																			
DFS	0.68	0.94	0.97	0.92	0.96	13.45																		
ESP	0.73	0.95	0.95	0.92	0.96	0.95	1.19																	
FRA	0.78	0.91	0.89	0.90	0.89	0.89	0.91	1.06																
GBR	0.80	0.87	0.84	0.86	0.86	0.82	0.83	0.90	1.43															
ITA	0.67	0.89	0.89	0.86	0.90	0.90	0.89	0.89	0.82	1.49														
NLD	0.72	0.90	0.93	0.92	0.94	0.92	0.92	0.89	0.86	0.86	5.26													
USA	0.69	0.96	0.96	0.90	0.93	0.96	0.95	0.88	0.82	0.88	0.90	1.63												
HUN	0.74	0.92	0.91	0.87	0.93	0.91	0.94	0.89	0.82	0.89	0.86	0.91	1.01											
POL	0.70	0.92	0.92	0.87	0.95	0.91	0.93	0.90	0.81	0.88	0.86	0.90	0.94	12.08										
NZL	0.68	0.65	0.65	0.66	0.65	0.65	0.65	0.68	0.71	0.65	0.65	0.65	0.66	0.66	0.14									
ZAF	0.82	0.81	0.78	0.78	0.74	0.70	0.78	0.84	0.87	0.69	0.75	0.77	0.75	0.79	0.66	0.83								

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JPN   0.67   0.91   0.97   0.90   0.94   0.97   0.94   0.87   0.80   0.89   0.89   0.94   0.89   0.93   0.65   0.71   1.75
CZE   0.69   0.91   0.92   0.84   0.93   0.92   0.91   0.87   0.85   0.87   0.88   0.91   0.93   0.94   0.65   0.77   0.92  15.28
EST   0.72   0.85   0.85   0.85   0.90   0.88   0.88   0.84   0.72   0.84   0.89   0.85   0.84   0.87   0.67   0.67   0.86   0.82  20.39
IRL   0.79   0.77   0.71   0.78   0.73   0.70   0.71   0.81   0.91   0.73   0.76   0.70   0.71   0.72   0.69   0.79   0.69   0.72   0.68   1.56
KOR   0.67   0.81   0.84   0.80   0.83   0.86   0.86   0.81   0.74   0.79   0.82   0.84   0.84   0.81   0.66   0.67   0.85   0.79   0.76   0.67   2.25
SVN   0.68   0.90   0.94   0.90   0.92   0.94   0.89   0.89   0.80   0.89   0.91   0.91   0.89   0.86   0.67   0.67   0.91   0.87   0.85   0.69   0.83  23.05
PRT   0.67   0.87   0.84   0.79   0.84   0.86   0.86   0.83   0.76   0.83   0.81   0.85   0.85   0.82   0.65   0.66   0.82   0.81   0.72   0.66   0.80   0.81   2.33
LVA   0.66   0.75   0.80   0.84   0.83   0.80   0.79   0.80   0.74   0.75   0.83   0.77   0.80   0.80   0.66   0.66   0.79   0.81   0.75   0.66   0.78   0.80   0.74   0.30
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HOL    rlr
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        AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    ZAF    JPN    CZE    EST    IRL    KOR    SVN    PRT    LVA
AUS    0.24
BEL    0.64   1.79
CAN    0.59   0.85   6.74
CHE    0.70   0.85   0.75  12.34
DEU    0.61   0.92   0.88   0.75  11.36
DFS    0.57   0.89   0.90   0.74   0.93  13.23
ESP    0.60   0.87   0.88   0.72   0.87   0.89   1.11
FRA    0.70   0.92   0.85   0.86   0.86   0.83   0.87   1.08
GBR    0.49   0.64   0.68   0.55   0.64   0.61   0.69   0.63   1.51
ITA    0.58   0.78   0.81   0.66   0.77   0.74   0.81   0.82   0.66   1.81
NLD    0.57   0.89   0.87   0.71   0.91   0.91   0.84   0.83   0.64   0.75   4.10
USA    0.53   0.78   0.87   0.62   0.77   0.83   0.79   0.78   0.66   0.87   0.80   1.77
HUN    0.63   0.84   0.77   0.75   0.80   0.78   0.75   0.81   0.53   0.76   0.75   0.78   1.12
POL    0.52   0.82   0.84   0.67   0.78   0.83   0.77   0.80   0.52   0.79   0.74   0.76   0.72  14.98
ZAF    0.57   0.71   0.56   0.60   0.55   0.55   0.50   0.63   0.49   0.62   0.52   0.70   0.65   0.61   0.73
JPN    0.59   0.83   0.88   0.77   0.84   0.92   0.80   0.82   0.49   0.70   0.83   0.77   0.75   0.76   0.56   2.00
CZE    0.57   0.83   0.81   0.70   0.84   0.81   0.77   0.79   0.56   0.80   0.78   0.79   0.78   0.82   0.68   0.74  16.90
EST    0.52   0.69   0.59   0.57   0.74   0.77   0.61   0.60   0.50   0.50   0.73   0.51   0.57   0.59   0.48   0.76   0.57  18.94
IRL    0.50   0.52   0.55   0.50   0.50   0.50   0.59   0.55   0.71   0.65   0.54   0.53   0.50   0.50   0.50   0.50   0.50   0.52   1.64
KOR    0.56   0.72   0.74   0.62   0.72   0.76   0.78   0.77   0.50   0.70   0.69   0.71   0.65   0.69   0.51   0.73   0.71   0.59   0.50   2.00
SVN    0.53   0.86   0.80   0.75   0.83   0.84   0.75   0.85   0.50   0.73   0.84   0.76   0.84   0.80   0.54   0.83   0.70   0.66   0.49   0.66  25.66
PRT    0.54   0.84   0.73   0.68   0.85   0.76   0.77   0.81   0.59   0.72   0.76   0.69   0.72   0.76   0.52   0.67   0.78   0.64   0.49   0.69   0.83   2.39
LVA    0.56   0.74   0.73   0.70   0.75   0.80   0.73   0.70   0.53   0.73   0.72   0.71   0.69   0.80   0.50   0.73   0.74   0.61   0.49   0.69   0.73   0.74   0.29
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HOL    fan
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        AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    ZAF    JPN    CZE    EST    IRL    KOR    SVN    PRT    LVA
AUS    0.32
BEL    0.68   2.04
CAN    0.61   0.83   7.32
CHE    0.65   0.85   0.81  12.02
DEU    0.69   0.88   0.83   0.78  12.69
DFS    0.62   0.92   0.88   0.81   0.87  13.19
ESP    0.66   0.76   0.85   0.69   0.85   0.81   1.03
FRA    0.77   0.79   0.79   0.73   0.90   0.74   0.85   1.03
GBR    0.75   0.80   0.82   0.74   0.92   0.78   0.85   0.92   1.44
ITA    0.61   0.69   0.77   0.70   0.77   0.73   0.76   0.74   0.75   1.55
NLD    0.68   0.78   0.75   0.72   0.91   0.79   0.79   0.85   0.88   0.72   5.05
USA    0.65   0.75   0.88   0.72   0.84   0.81   0.85   0.82   0.84   0.85   0.80   1.58
HUN    0.76   0.77   0.78   0.78   0.88   0.74   0.84   0.91   0.87   0.69   0.80   0.80   1.17
POL    0.61   0.73   0.76   0.73   0.71   0.72   0.72   0.69   0.69   0.74   0.63   0.76   0.74  13.11
ZAF    0.83   0.78   0.77   0.74   0.83   0.73   0.78   0.85   0.87   0.70   0.74   0.80   0.87   0.64   0.89
JPN    0.74   0.76   0.74   0.84   0.83   0.75   0.76   0.80   0.76   0.69   0.79   0.77   0.86   0.68   0.76   2.10
CZE    0.71   0.85   0.84   0.79   0.92   0.84   0.84   0.88   0.85   0.76   0.81   0.83   0.92   0.75   0.81   0.86  15.62
EST    0.75   0.77   0.75   0.76   0.85   0.79   0.85   0.86   0.83   0.62   0.85   0.76   0.85   0.62   0.75   0.89   0.87  23.59
IRL    0.69   0.70   0.73   0.64   0.81   0.69   0.74   0.77   0.91   0.69   0.76   0.72   0.71   0.66   0.75   0.61   0.72   0.70   1.59
KOR    0.62   0.62   0.70   0.62   0.69   0.64   0.76   0.69   0.69   0.62   0.64   0.71   0.72   0.62   0.63   0.61   0.70   0.64   0.62   1.52
SVN    0.62   0.78   0.83   0.68   0.88   0.84   0.81   0.77   0.78   0.71   0.74   0.82   0.79   0.79   0.72   0.76   0.87   0.78   0.78   0.62  24.69
PRT    0.61   0.61   0.61   0.61   0.74   0.61   0.72   0.74   0.66   0.64   0.68   0.72   0.63   0.61   0.65   0.65   0.70   0.71   0.61   0.70   0.71   2.06
LVA    0.61   0.65   0.62   0.63   0.66   0.68   0.64   0.72   0.68   0.61   0.65   0.68   0.69   0.60   0.61   0.61   0.72   0.74   0.61   0.61   0.67   0.60   0.28
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HOL    fua
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        AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    ZAF    JPN    CZE    EST    IRL    KOR    SVN    PRT    LVA
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AUS   0.37
BEL   0.74   1.46
CAN   0.77   0.78   5.16
CHE   0.83   0.81   0.92  11.99
DEU   0.75   0.84   0.93   0.87  12.28
DFS   0.76   0.85   0.91   0.89   0.88  11.87
ESP   0.78   0.79   0.88   0.86   0.84   0.83   0.86
FRA   0.79   0.90   0.90   0.89   0.90   0.92   0.84   1.06
GBR   0.78   0.79   0.94   0.88   0.96   0.87   0.87   0.90   1.31
ITA   0.70   0.65   0.88   0.83   0.86   0.76   0.85   0.81   0.90   1.28
NLD   0.75   0.86   0.92   0.91   0.95   0.89   0.86   0.92   0.93   0.83   4.95
USA   0.75   0.71   0.94   0.87   0.90   0.84   0.89   0.85   0.94   0.93   0.88   1.41
HUN   0.77   0.74   0.89   0.87   0.86   0.87   0.82   0.85   0.87   0.79   0.85   0.82   1.03
POL   0.72   0.81   0.85   0.85   0.91   0.87   0.81   0.88   0.88   0.78   0.86   0.81   0.85  11.73
NZL   0.77   0.77   0.84   0.80   0.84   0.81   0.80   0.86   0.87   0.76   0.84   0.84   0.73   0.75   0.41
ZAF   0.75   0.77   0.86   0.82   0.87   0.86   0.81   0.84   0.89   0.71   0.85   0.82   0.82   0.77   0.80   0.85
JPN   0.75   0.76   0.95   0.91   0.90   0.91   0.85   0.88   0.91   0.86   0.89   0.91   0.88   0.89   0.81   0.81   1.44
CZE   0.74   0.86   0.87   0.85   0.93   0.90   0.79   0.89   0.90   0.75   0.89   0.79   0.91   0.89   0.76   0.89   0.86  14.24
EST   0.62   0.74   0.78   0.75   0.79   0.83   0.65   0.81   0.76   0.60   0.80   0.69   0.79   0.76   0.67   0.72   0.70   0.79  18.48
IRL   0.77   0.74   0.83   0.81   0.83   0.74   0.86   0.81   0.92   0.86   0.82   0.88   0.70   0.78   0.83   0.78   0.78   0.74   0.64   1.17
KOR   0.68   0.75   0.68   0.74   0.69   0.77   0.74   0.75   0.69   0.58   0.70   0.64   0.77   0.73   0.67   0.80   0.72   0.80   0.63   0.68   3.23
SVN   0.50   0.78   0.51   0.58   0.69   0.58   0.64   0.65   0.55   0.53   0.67   0.52   0.53   0.65   0.54   0.52   0.59   0.67   0.46   0.53   0.65  19.44
PRT   0.58   0.71   0.65   0.63   0.62   0.67   0.70   0.65   0.62   0.55   0.65   0.63   0.56   0.61   0.70   0.65   0.67   0.61   0.56   0.65   0.66   0.59   1.39
LVA   0.65   0.84   0.77   0.73   0.78   0.79   0.68   0.80   0.73   0.60   0.79   0.69   0.79   0.76   0.74   0.69   0.74   0.83   0.70   0.62   0.73   0.62   0.60   0.34

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HOL   ruh
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      AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    ZAF    JPN    CZE    EST    IRL    KOR    SVN    PRT    LVA
AUS   0.40
BEL   0.83   1.24
CAN   0.77   0.91   5.40
CHE   0.81   0.91   0.93  11.20
DEU   0.81   0.89   0.88   0.88  13.08
DFS   0.77   0.91   0.86   0.91   0.95  11.60
ESP   0.81   0.87   0.84   0.86   0.91   0.91   0.81
FRA   0.77   0.89   0.85   0.88   0.90   0.93   0.89   1.07
GBR   0.77   0.83   0.73   0.81   0.85   0.90   0.87   0.88   1.36
ITA   0.70   0.75   0.70   0.72   0.82   0.85   0.87   0.83   0.84   1.25
NLD   0.74   0.83   0.75   0.83   0.92   0.92   0.90   0.88   0.88   0.83   4.36
USA   0.76   0.84   0.81   0.85   0.90   0.92   0.89   0.88   0.92   0.88   0.86   1.49
HUN   0.80   0.78   0.79   0.79   0.86   0.82   0.87   0.82   0.80   0.81   0.81   0.81   0.98
POL   0.70   0.81   0.70   0.76   0.82   0.85   0.86   0.84   0.81   0.83   0.84   0.79   0.79  10.28
NZL   0.79   0.81   0.74   0.83   0.83   0.87   0.84   0.85   0.91   0.80   0.83   0.90   0.82   0.77   0.39
ZAF   0.70   0.75   0.70   0.78   0.75   0.83   0.79   0.75   0.86   0.77   0.77   0.81   0.73   0.70   0.81   0.79
JPN   0.81   0.92   0.92   0.92   0.91   0.92   0.93   0.90   0.82   0.82   0.86   0.87   0.86   0.85   0.82   0.78   1.46
CZE   0.79   0.88   0.88   0.85   0.89   0.85   0.80   0.83   0.73   0.72   0.76   0.78   0.85   0.72   0.76   0.77   0.86  14.54
EST   0.73   0.77   0.78   0.78   0.83   0.83   0.85   0.83   0.77   0.79   0.78   0.84   0.83   0.80   0.80   0.72   0.85   0.80  17.14
IRL   0.71   0.75   0.70   0.73   0.78   0.82   0.83   0.79   0.91   0.85   0.82   0.89   0.77   0.76   0.83   0.78   0.76   0.70   0.78   1.03
KOR   0.73   0.82   0.84   0.77   0.72   0.71   0.76   0.71   0.70   0.70   0.70   0.70   0.71   0.70   0.70   0.71   0.83   0.79   0.73   0.71   3.40
SVN   0.73   0.91   0.86   0.82   0.88   0.89   0.85   0.86   0.75   0.80   0.82   0.80   0.75   0.78   0.72   0.71   0.87   0.86   0.81   0.73   0.78  16.60
PRT   0.72   0.78   0.70   0.70   0.79   0.83   0.83   0.80   0.86   0.83   0.81   0.81   0.76   0.80   0.76   0.75   0.78   0.70   0.71   0.80   0.70   0.78   1.24
LVA   0.70   0.74   0.71   0.71   0.78   0.74   0.73   0.70   0.71   0.69   0.74   0.72   0.69   0.69   0.70   0.70   0.74   0.71   0.70   0.70   0.70   0.76   0.69   0.43

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HOL   usu
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      AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    ZAF    JPN    CZE    EST    IRL    KOR    SVN    PRT    LVA
AUS   0.35
BEL   0.64   1.47
CAN   0.77   0.77   5.63
CHE   0.76   0.87   0.91  11.87
DEU   0.73   0.79   0.92   0.94  11.59
DFS   0.70   0.86   0.80   0.90   0.83  11.59
ESP   0.78   0.68   0.83   0.81   0.79   0.79   0.78
FRA   0.74   0.86   0.78   0.86   0.75   0.91   0.82   1.07
GBR   0.81   0.65   0.80   0.80   0.75   0.82   0.91   0.88   1.35
ITA   0.70   0.68   0.78   0.79   0.79   0.78   0.89   0.81   0.86   1.37
NLD   0.79   0.79   0.83   0.87   0.81   0.90   0.89   0.92   0.92   0.81   4.41
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USA   0.79 0.69 0.81 0.79 0.75 0.86 0.91 0.88 0.95 0.87 0.91 1.47
HUN   0.71 0.90 0.81 0.91 0.84 0.90 0.76 0.90 0.77 0.78 0.84 0.79 1.01
POL   0.67 0.76 0.83 0.85 0.90 0.78 0.75 0.70 0.68 0.74 0.75 0.71 0.82 11.31
NZL   0.60 0.58 0.57 0.58 0.58 0.57 0.68 0.57 0.60 0.64 0.57 0.67 0.58 0.58 0.38
ZAF   0.77 0.62 0.66 0.66 0.59 0.75 0.77 0.75 0.81 0.65 0.77 0.82 0.75 0.65 0.62 0.83
JPN   0.60 0.95 0.72 0.84 0.74 0.84 0.62 0.88 0.65 0.66 0.77 0.68 0.88 0.71 0.57 0.60 1.63
CZE   0.59 0.88 0.80 0.86 0.87 0.77 0.65 0.72 0.61 0.69 0.69 0.63 0.89 0.85 0.57 0.59 0.83 14.03
EST   0.71 0.89 0.82 0.87 0.86 0.85 0.70 0.82 0.71 0.67 0.82 0.70 0.86 0.81 0.58 0.62 0.87 0.87 18.36
IRL   0.79 0.69 0.83 0.80 0.78 0.75 0.87 0.80 0.91 0.87 0.84 0.87 0.75 0.75 0.70 0.74 0.64 0.67 0.70 1.06
KOR   0.63 0.70 0.84 0.75 0.81 0.68 0.72 0.62 0.61 0.74 0.66 0.68 0.73 0.81 0.58 0.65 0.65 0.76 0.64 0.68 2.58
SVN   0.61 0.77 0.86 0.83 0.88 0.72 0.64 0.63 0.59 0.61 0.65 0.60 0.73 0.86 0.59 0.55 0.71 0.85 0.82 0.69 0.74 21.00
PRT   0.69 0.65 0.77 0.77 0.81 0.69 0.79 0.64 0.73 0.77 0.72 0.69 0.71 0.75 0.57 0.58 0.58 0.71 0.66 0.76 0.71 0.71 1.51
LVA   0.58 0.58 0.63 0.64 0.61 0.65 0.73 0.69 0.75 0.67 0.67 0.69 0.64 0.64 0.65 0.59 0.58 0.58 0.59 0.71 0.57 0.59 0.64 0.30

HOL   ude

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.58																						
BEL	0.90	1.35																					
CAN	0.88	0.96	5.14																				
CHE	0.92	0.95	0.96	11.81																			
DEU	0.90	0.96	0.97	0.96	13.18																		
DFS	0.88	0.95	0.96	0.96	0.97	11.88																	
ESP	0.89	0.97	0.98	0.97	0.96	0.97	1.08																
FRA	0.91	0.97	0.97	0.98	0.98	0.96	0.97	1.11															
GBR	0.89	0.97	0.97	0.95	0.96	0.94	0.97	0.97	1.26														
ITA	0.88	0.95	0.96	0.96	0.96	0.95	0.97	0.97	0.95	1.31													
NLD	0.90	0.96	0.97	0.97	0.98	0.97	0.97	0.97	0.97	0.95	4.85												
USA	0.88	0.95	0.96	0.96	0.96	0.96	0.97	0.97	0.97	0.96	0.96	1.47											
HUN	0.88	0.95	0.97	0.95	0.95	0.95	0.96	0.95	0.95	0.95	0.95	0.95	1.01										
POL	0.89	0.95	0.94	0.94	0.95	0.93	0.94	0.94	0.93	0.93	0.94	0.93	0.94	11.04									
ZAF	0.88	0.93	0.94	0.91	0.92	0.90	0.92	0.92	0.95	0.89	0.92	0.94	0.92	0.91	0.92								
JPN	0.89	0.95	0.97	0.96	0.96	0.97	0.97	0.97	0.94	0.97	0.95	0.97	0.95	0.94	0.90	1.22							
CZE	0.89	0.96	0.97	0.94	0.96	0.93	0.95	0.94	0.95	0.94	0.95	0.93	0.96	0.93	0.93	0.92	13.50						
EST	0.87	0.93	0.94	0.92	0.93	0.93	0.94	0.91	0.92	0.93	0.93	0.94	0.93	0.93	0.91	0.93	0.94	15.40					
IRL	0.88	0.93	0.90	0.91	0.89	0.88	0.91	0.91	0.96	0.89	0.92	0.93	0.88	0.88	0.94	0.89	0.89	0.89	1.29				
KOR	0.88	0.88	0.88	0.89	0.88	0.89	0.91	0.88	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.91	0.88	0.88	0.88	4.59			
SVN	0.88	0.94	0.95	0.94	0.95	0.92	0.95	0.94	0.93	0.95	0.95	0.92	0.94	0.95	0.89	0.93	0.95	0.93	0.88	0.87	16.88		
PRT	0.87	0.92	0.91	0.90	0.91	0.90	0.91	0.90	0.91	0.92	0.91	0.91	0.91	0.89	0.91	0.90	0.94	0.89	0.87	0.87	0.90	1.48	
LVA	0.87	0.87	0.87	0.87	0.88	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.36

HOL   ftp

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.61																							
BEL	0.94	1.45																						
CAN	0.94	0.96	6.04																					
CHE	0.96	0.97	0.98	11.94																				
DEU	0.94	0.96	0.98	0.97	13.91																			
DFS	0.90	0.96	0.96	0.94	0.95	10.88																		
ESP	0.93	0.93	0.97	0.95	0.97	0.92	0.93																	
FRA	0.93	0.99	0.97	0.97	0.95	0.95	0.92	1.10																
GBR	0.92	0.90	0.96	0.93	0.95	0.91	0.96	0.89	1.36															
ITA	0.86	0.86	0.87	0.86	0.86	0.86	0.86	0.86	0.86	1.15														
NLD	0.94	0.97	0.98	0.97	0.98	0.96	0.95	0.96	0.94	0.86	5.14													
USA	0.86	0.87	0.92	0.88	0.91	0.92	0.92	0.86	0.95	0.86	0.90	1.38												
HUN	0.95	0.93	0.95	0.95	0.95	0.91	0.95	0.92	0.92	0.86	0.94	0.88	0.93											
POL	0.87	0.88	0.93	0.89	0.92	0.89	0.92	0.88	0.92	0.86	0.92	0.88	0.91	11.75										
NZL	0.91	0.89	0.92	0.91	0.90	0.86	0.89	0.90	0.91	0.86	0.91	0.87	0.89	0.87	0.31									
ZAF	0.90	0.91	0.94	0.93	0.91	0.89	0.93	0.92	0.93	0.86	0.92	0.88	0.92	0.87	0.90	0.82								
JPN	0.93	0.99	0.97	0.97	0.95	0.95	0.93	0.98	0.90	0.86	0.97	0.86	0.93	0.90	0.89	0.92	1.49							
CZE	0.94	0.95	0.96	0.96	0.95	0.92	0.94	0.94	0.91	0.86	0.96	0.87	0.96	0.91	0.90	0.92	0.95	13.16						
EST	0.94	0.94	0.96	0.95	0.94	0.91	0.93	0.93	0.91	0.86	0.96	0.86	0.93	0.90	0.88	0.89	0.95	0.96	18.96					
IRL	0.89	0.87	0.92	0.90	0.92	0.88	0.92	0.87	0.96	0.86	0.91	0.89	0.88	0.86	0.87	0.90	0.87	0.87	0.89	1.31				
KOR	0.88	0.91	0.90	0.91	0.88	0.89	0.90	0.90	0.86	0.86	0.89	0.86	0.91	0.86	0.86	0.89	0.92	0.90	0.89	0.85	3.15			
SVN	0.94	0.95	0.96	0.95	0.97	0.95	0.97	0.93	0.94	0.86	0.96	0.90	0.94	0.88	0.88	0.88	0.94	0.94	0.93	0.91	0.89	16.17		
PRT	0.89	0.89	0.92	0.90	0.93	0.88	0.93	0.87	0.92	0.86	0.91	0.87	0.92	0.91	0.86	0.87	0.90	0.91	0.91	0.87	0.86	0.93	1.47	

LVA   0.86   0.38

HOL   ft1

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA	NZL
AUS	0.78																							
BEL	0.93	1.41																						
CAN	0.95	0.92	5.16																					
CHE	0.93	0.97	0.91	11.32																				
DEU	0.94	0.98	0.95	0.97	13.57																			
DFS	0.93	0.97	0.92	0.98	0.98	10.83																		
ESP	0.93	0.98	0.93	0.96	0.98	0.97	1.08																	
FRA	0.94	0.90	0.98	0.89	0.93	0.91	0.91	1.07																
GBR	0.95	0.97	0.95	0.95	0.98	0.95	0.97	0.94	1.31															
ITA	0.89	0.92	0.93	0.90	0.94	0.92	0.92	0.92	0.95	1.39														
NLD	0.93	0.98	0.93	0.97	0.98	0.98	0.98	0.91	0.97	0.91	4.94													
USA	0.94	0.94	0.96	0.94	0.96	0.95	0.95	0.94	0.97	0.93	0.95	1.44												
HUN	0.89	0.96	0.89	0.96	0.95	0.95	0.95	0.89	0.92	0.89	0.95	0.90	1.12											
POL	0.92	0.96	0.90	0.96	0.97	0.97	0.96	0.89	0.95	0.92	0.96	0.94	0.96	11.21										
ZAF	0.92	0.93	0.89	0.91	0.91	0.92	0.94	0.89	0.92	0.89	0.92	0.91	0.91	0.93	0.87									
JPN	0.94	0.98	0.93	0.98	0.98	0.98	0.98	0.92	0.97	0.93	0.98	0.97	0.95	0.98	0.94	1.40								
CZE	0.93	0.96	0.92	0.97	0.98	0.97	0.97	0.90	0.96	0.92	0.97	0.95	0.95	0.98	0.92	0.98	14.48							
EST	0.91	0.94	0.89	0.94	0.96	0.96	0.94	0.89	0.92	0.91	0.94	0.91	0.94	0.97	0.88	0.95	0.96	16.33						
IRL	0.92	0.94	0.94	0.91	0.95	0.92	0.93	0.93	0.97	0.92	0.93	0.94	0.89	0.91	0.89	0.93	0.93	0.90	1.73					
KOR	0.90	0.93	0.89	0.92	0.92	0.93	0.94	0.89	0.92	0.89	0.93	0.91	0.92	0.93	0.90	0.94	0.92	0.90	0.89	4.27				
SVN	0.89	0.94	0.89	0.94	0.95	0.93	0.95	0.89	0.95	0.92	0.96	0.91	0.93	0.94	0.89	0.95	0.94	0.92	0.91	0.89	18.52			
PRT	0.89	0.95	0.91	0.93	0.95	0.95	0.93	0.89	0.93	0.92	0.95	0.93	0.91	0.94	0.89	0.95	0.95	0.93	0.92	0.89	0.92	1.83		
LVA	0.89	0.89	0.91	0.89	0.90	0.89	0.89	0.91	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.46	
NZL	0.94	0.90	0.94	0.89	0.92	0.90	0.91	0.94	0.93	0.89	0.92	0.91	0.89	0.90	0.88	0.91	0.89	0.89	0.91	0.89	0.88	0.89	0.88	0.55

HOL   rtp

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	POL	NZL	JPN	CZE	EST	IRL	KOR	SVN	PRT	ZAF	HUN	LVA
AUS	0.43																							
BEL	0.92	1.42																						
CAN	0.89	0.97	6.12																					
CHE	0.91	0.97	0.98	11.88																				
DEU	0.89	0.96	0.97	0.97	14.09																			
DFS	0.87	0.94	0.95	0.94	0.96	11.04																		
ESP	0.89	0.96	0.97	0.96	0.97	0.96	0.88																	
FRA	0.90	0.97	0.98	0.98	0.97	0.95	0.97	1.05																
GBR	0.90	0.96	0.97	0.96	0.97	0.95	0.97	0.98	1.45															
ITA	0.87	0.89	0.89	0.89	0.92	0.91	0.91	0.91	0.90	1.29														
NLD	0.90	0.96	0.98	0.97	0.98	0.97	0.98	0.98	0.98	0.91	5.06													
USA	0.88	0.94	0.95	0.93	0.95	0.97	0.96	0.94	0.97	0.90	0.96	1.59												
POL	0.87	0.93	0.94	0.92	0.96	0.93	0.95	0.93	0.93	0.90	0.95	0.91	11.22											
NZL	0.91	0.95	0.95	0.94	0.94	0.89	0.93	0.95	0.95	0.86	0.94	0.90	0.92	0.47										
JPN	0.91	0.97	0.98	0.97	0.96	0.96	0.97	0.97	0.96	0.91	0.98	0.96	0.94	0.93	1.56									
CZE	0.89	0.97	0.95	0.95	0.96	0.94	0.94	0.95	0.95	0.90	0.95	0.94	0.95	0.92	0.95	14.43								
EST	0.92	0.95	0.95	0.95	0.96	0.92	0.94	0.95	0.95	0.89	0.96	0.91	0.93	0.91	0.94	0.94	16.40							
IRL	0.87	0.93	0.93	0.92	0.93	0.91	0.92	0.93	0.94	0.87	0.93	0.90	0.89	0.93	0.92	0.89	0.89	1.25						
KOR	0.87	0.92	0.94	0.94	0.94	0.94	0.96	0.93	0.91	0.91	0.94	0.92	0.91	0.90	0.95	0.89	0.90	0.89	2.15					
SVN	0.87	0.92	0.94	0.93	0.95	0.92	0.95	0.94	0.94	0.90	0.95	0.91	0.94	0.91	0.92	0.93	0.93	0.91	0.92	14.97				
PRT	0.86	0.89	0.90	0.88	0.91	0.89	0.91	0.89	0.92	0.86	0.89	0.90	0.91	0.88	0.90	0.89	0.88	0.87	0.86	0.91	1.48			
ZAF	0.88	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.86	0.56		
HUN	0.89	0.95	0.93	0.94	0.96	0.95	0.96	0.96	0.96	0.90	0.96	0.95	0.96	0.92	0.95	0.95	0.94	0.90	0.90	0.94	0.90	0.87	1.06	
LVA	0.86	0.92	0.90	0.90	0.90	0.90	0.92	0.92	0.91	0.88	0.93	0.87	0.92	0.88	0.91	0.91	0.93	0.86	0.89	0.92	0.89	0.86	0.92	0.43

HOL   ocs

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	JPN	CZE	EST	IRL	KOR	SVN	PRT
AUS	0.97																					
BEL	0.57	1.23																				
CAN	0.61	0.67	4.69																			
CHE	0.60	0.78	0.84	11.13																		
DEU	0.56	0.67	0.76	0.85	12.89																	

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DFS    0.64   0.65   0.70   0.80   0.85  10.17
ESP    0.64   0.66   0.75   0.81   0.85   0.87   0.79
FRA    0.55   0.76   0.70   0.88   0.85   0.87   0.88   1.08
GBR    0.65   0.70   0.77   0.89   0.90   0.87   0.86   0.88   1.01
ITA    0.52   0.70   0.71   0.83   0.81   0.82   0.85   0.87   0.82   0.79
NLD    0.58   0.67   0.72   0.83   0.89   0.88   0.86   0.85   0.88   0.79   2.88
USA    0.59   0.64   0.75   0.86   0.86   0.88   0.86   0.86   0.89   0.83   0.86   0.89
HUN    0.55   0.71   0.69   0.79   0.81   0.72   0.75   0.78   0.81   0.78   0.72   0.76   1.03
POL    0.43   0.63   0.57   0.59   0.59   0.63   0.61   0.67   0.57   0.67   0.61   0.60   0.58  10.75
NZL    0.77   0.46   0.63   0.62   0.62   0.59   0.61   0.54   0.71   0.49   0.64   0.67   0.55   0.40   0.30
JPN    0.57   0.80   0.75   0.91   0.75   0.76   0.78   0.82   0.78   0.81   0.77   0.82   0.72   0.66   0.50   0.58
CZE    0.60   0.69   0.79   0.81   0.85   0.75   0.78   0.78   0.81   0.74   0.77   0.78   0.82   0.58   0.65   0.71  13.10
EST    0.46   0.59   0.60   0.59   0.73   0.62   0.58   0.65   0.60   0.56   0.69   0.56   0.69   0.56   0.47   0.57   0.72  18.81
IRL    0.57   0.49   0.65   0.67   0.68   0.65   0.66   0.61   0.79   0.63   0.62   0.64   0.63   0.43   0.56   0.56   0.63   0.51   0.88
KOR    0.55   0.58   0.56   0.62   0.62   0.60   0.66   0.67   0.58   0.66   0.62   0.63   0.60   0.62   0.42   0.62   0.59   0.59   0.44   6.33
SVN    0.48   0.79   0.55   0.65   0.70   0.68   0.61   0.67   0.69   0.70   0.66   0.61   0.61   0.56   0.44   0.64   0.62   0.74   0.50   0.57  16.30
PRT    0.54   0.66   0.63   0.70   0.77   0.77   0.77   0.77   0.80   0.76   0.77   0.76   0.68   0.64   0.48   0.75   0.70   0.56   0.60   0.64   0.60   0.29
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HOL   ous

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	JPN	CZE	EST	IRL	SVN	PRT
AUS	1.29																				
BEL	0.67	1.29																			
CAN	0.69	0.80	5.80																		
CHE	0.80	0.85	0.93	11.75																	
DEU	0.75	0.79	0.89	0.92	13.64																
DFS	0.65	0.83	0.87	0.90	0.86	13.08															
ESP	0.75	0.69	0.78	0.88	0.84	0.77	0.88														
FRA	0.68	0.82	0.88	0.94	0.90	0.91	0.82	1.02													
GBR	0.83	0.68	0.77	0.87	0.83	0.70	0.88	0.75	1.41												
ITA	0.68	0.79	0.84	0.93	0.87	0.88	0.84	0.91	0.81	1.17											
NLD	0.69	0.81	0.89	0.94	0.92	0.88	0.82	0.93	0.78	0.86	4.53										
USA	0.74	0.73	0.88	0.91	0.86	0.77	0.86	0.81	0.88	0.85	0.85	1.19									
HUN	0.70	0.78	0.80	0.86	0.85	0.79	0.81	0.80	0.76	0.77	0.76	0.76	1.16								
POL	0.69	0.78	0.72	0.78	0.77	0.71	0.70	0.73	0.76	0.74	0.72	0.72	0.72	11.13							
NZL	0.81	0.69	0.82	0.88	0.79	0.69	0.78	0.79	0.84	0.74	0.82	0.88	0.74	0.70	0.42						
JPN	0.75	0.81	0.89	0.94	0.88	0.80	0.80	0.85	0.84	0.88	0.86	0.88	0.79	0.82	0.82	0.74					
CZE	0.69	0.86	0.87	0.91	0.93	0.90	0.80	0.92	0.75	0.86	0.87	0.80	0.88	0.75	0.75	0.85	12.90				
EST	0.70	0.83	0.85	0.89	0.85	0.92	0.79	0.90	0.75	0.86	0.85	0.76	0.81	0.69	0.77	0.77	0.88	16.10			
IRL	0.81	0.65	0.68	0.79	0.75	0.64	0.81	0.67	0.95	0.76	0.69	0.82	0.69	0.71	0.81	0.76	0.69	0.71	0.93		
SVN	0.68	0.80	0.69	0.73	0.72	0.69	0.68	0.69	0.72	0.71	0.69	0.70	0.70	0.84	0.68	0.73	0.72	0.74	0.71	16.75	
PRT	0.68	0.68	0.76	0.77	0.75	0.68	0.76	0.72	0.80	0.74	0.75	0.78	0.68	0.71	0.73	0.79	0.73	0.69	0.74	0.69	0.43

HOL   ofl

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	JPN	CZE	EST	IRL	SVN	PRT
AUS	0.76																				
BEL	0.63	1.71																			
CAN	0.35	0.63	4.75																		
CHE	0.56	0.76	0.80	11.46																	
DEU	0.38	0.76	0.71	0.78	11.75																
DFS	0.35	0.63	0.80	0.77	0.80	13.06															
ESP	0.42	0.70	0.74	0.76	0.71	0.82	0.97														
FRA	0.52	0.80	0.67	0.75	0.76	0.60	0.75	1.05													
GBR	0.50	0.74	0.66	0.79	0.73	0.72	0.79	0.84	1.55												
ITA	0.49	0.72	0.58	0.70	0.72	0.59	0.70	0.79	0.67	1.61											
NLD	0.42	0.82	0.67	0.70	0.75	0.64	0.65	0.81	0.73	0.67	4.72										
USA	0.50	0.70	0.60	0.77	0.74	0.67	0.73	0.71	0.73	0.78	0.67	1.50									
HUN	0.57	0.77	0.56	0.62	0.70	0.58	0.58	0.75	0.64	0.72	0.67	0.70	1.19								
POL	0.46	0.69	0.56	0.67	0.67	0.58	0.58	0.65	0.58	0.70	0.58	0.73	0.71	13.63							
JPN	0.44	0.64	0.64	0.78	0.78	0.73	0.69	0.60	0.61	0.72	0.60	0.85	0.61	0.74		0.54					
CZE	0.48	0.75	0.62	0.72	0.78	0.63	0.65	0.68	0.64	0.78	0.62	0.83	0.80	0.82		0.80	17.30				
EST	0.44	0.60	0.58	0.60	0.64	0.58	0.57	0.65	0.58	0.58	0.70	0.57	0.68	0.58		0.59	0.68	20.01			
IRL	0.56	0.72	0.60	0.78	0.68	0.65	0.69	0.68	0.78	0.67	0.62	0.66	0.66	0.59		0.68	0.63	0.43	1.34		
SVN	0.46	0.80	0.57	0.66	0.68	0.62	0.57	0.71	0.58	0.67	0.70	0.70	0.84	0.77		0.73	0.78	0.72	0.62	23.22	
PRT	0.35	0.57	0.56	0.57	0.60	0.57	0.60	0.68	0.62	0.66	0.62	0.61	0.64	0.57		0.57	0.61	0.69	0.47	0.63	0.19

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HOL    loc
--------------------------------------------------------------------------------
        BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    CZE    IRL    KOR    SVN    PRT    EST    HUN    POL
BEL    1.79
CAN    0.85   6.74
CHE    0.56   0.63  12.40
DEU    0.67   0.74   0.69  11.59
DFS    0.88   0.91   0.51   0.69  13.22
ESP    0.63   0.74   0.68   0.74   0.74   0.96
FRA    0.80   0.79   0.73   0.84   0.70   0.77   1.05
GBR    0.67   0.69   0.89   0.82   0.65   0.79   0.86   1.51
ITA    0.61   0.69   0.64   0.74   0.60   0.75   0.78   0.73   1.91
NLD    0.85   0.82   0.69   0.82   0.78   0.70   0.82   0.78   0.64   4.34
USA    0.67   0.78   0.50   0.78   0.74   0.74   0.76   0.69   0.75   0.68   1.57
CZE    0.51   0.61   0.55   0.63   0.61   0.64   0.63   0.66   0.69   0.50   0.62  20.57
IRL    0.58   0.56   0.51   0.64   0.52   0.63   0.68   0.72   0.62   0.62   0.56   0.51   1.64
KOR    0.56   0.61   0.52   0.51   0.55   0.62   0.65   0.52   0.54   0.54   0.51   0.53   0.51  10.14
SVN    0.74   0.69   0.56   0.70   0.70   0.69   0.78   0.65   0.67   0.61   0.65   0.68   0.53   0.55  28.05
PRT    0.50   0.50   0.54   0.60   0.50   0.59   0.53   0.60   0.58   0.51   0.50   0.63   0.50   0.51   0.67   2.08
EST    0.54   0.52   0.53   0.52   0.52   0.52   0.53   0.52   0.52   0.51   0.51   0.54   0.53   0.68   0.67   0.53  22.57
HUN    0.69   0.70   0.51   0.67   0.72   0.61   0.75   0.68   0.64   0.65   0.65   0.82   0.51   0.63   0.77   0.56   0.61   1.18
POL    0.51   0.55   0.52   0.64   0.50   0.55   0.65   0.55   0.62   0.50   0.67   0.72   0.51   0.51   0.75   0.50   0.53   0.67  15.73

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HOL    bcs
--------------------------------------------------------------------------------
        BEL    CHE    DEU    DFS    FRA    GBR    ITA    NLD    USA    CZE    JPN    IRL    KOR    CAN    PRT    ESP    SVN    EST    HUN    NZL    POL
BEL    0.98
CHE    0.72  11.76
DEU    0.72   0.90  13.43
DFS    0.77   0.90   0.95  12.18
FRA    0.73   0.93   0.95   0.95   0.99
GBR    0.76   0.91   0.90   0.90   0.93   1.60
ITA    0.72   0.91   0.95   0.95   0.96   0.90   6.62
NLD    0.72   0.93   0.95   0.95   0.95   0.91   0.94   5.01
USA    0.77   0.72   0.80   0.80   0.80   0.76   0.78   0.76   1.37
CZE    0.74   0.87   0.96   0.95   0.92   0.89   0.94   0.93   0.77  13.81
JPN    0.80   0.92   0.97   0.97   0.97   0.92   0.96   0.95   0.84   0.95   1.69
IRL    0.72   0.87   0.79   0.85   0.88   0.93   0.83   0.85   0.72   0.77   0.86   0.99
KOR    0.72   0.75   0.85   0.86   0.86   0.82   0.85   0.80   0.75   0.86   0.88   0.73   2.43
CAN    0.74   0.93   0.96   0.94   0.95   0.95   0.94   0.95   0.81   0.94   0.98   0.87   0.84   6.01
PRT    0.72   0.86   0.87   0.86   0.89   0.87   0.85   0.85   0.71   0.83   0.87   0.80   0.83   0.88   1.91
ESP    0.73   0.88   0.92   0.93   0.95   0.93   0.92   0.91   0.76   0.91   0.94   0.82   0.87   0.94   0.88   1.03
SVN    0.72   0.88   0.91   0.91   0.89   0.80   0.89   0.91   0.72   0.90   0.89   0.75   0.79   0.85   0.75   0.85  21.39
EST    0.73   0.83   0.89   0.87   0.88   0.76   0.87   0.91   0.82   0.87   0.88   0.73   0.74   0.86   0.75   0.79   0.87  16.69
HUN    0.72   0.87   0.94   0.92   0.92   0.87   0.94   0.89   0.75   0.95   0.93   0.76   0.85   0.93   0.84   0.91   0.86   0.83   0.99
NZL    0.71   0.90   0.92   0.92   0.93   0.92   0.92   0.88   0.74   0.89   0.92   0.88   0.81   0.92   0.85   0.87   0.84   0.81   0.89   0.16
POL    0.73   0.86   0.92   0.89   0.91   0.89   0.90   0.87   0.75   0.91   0.92   0.80   0.79   0.91   0.86   0.88   0.84   0.78   0.91   0.85  11.25

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JER    sta
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.54
CAN    0.89   6.70
DFS    0.91   0.96  11.76
GBR    0.91   0.96   0.94   1.07
ITA    0.88   0.95   0.93   0.95   1.50
NZL    0.87   0.84   0.85   0.90   0.87   0.36
USA    0.90   0.97   0.95   0.96   0.94   0.88   1.66
ZAF    0.87   0.85   0.85   0.92   0.87   0.90   0.86   8.88
NLD    0.89   0.95   0.97   0.94   0.92   0.85   0.93   0.87   5.17
CHE    0.90   0.96   0.96   0.95   0.93   0.85   0.94   0.87   0.97  11.22

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JER    cwi
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
```

```
AUS     0.29
CAN     0.73    6.51
DFS     0.73    0.82   15.60
GBR     0.81    0.91    0.85    1.81
ITA     0.65    0.79    0.69    0.74    1.63
NZL     0.80    0.72    0.66    0.76    0.66    0.37
USA     0.74    0.90    0.81    0.84    0.91    0.67    1.01
ZAF     0.69    0.78    0.72    0.81    0.73    0.78    0.77    8.63
NLD     0.74    0.91    0.89    0.90    0.72    0.70    0.84    0.81    4.44
CHE     0.67    0.87    0.86    0.83    0.82    0.68    0.86    0.72    0.86   12.07

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JER   bde
------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     ZAF     NLD     USA     CHE
AUS     0.33
CAN     0.75    5.63
DFS     0.76    0.86   13.63
GBR     0.74    0.85    0.85    1.54
ITA     0.70    0.74    0.78    0.85    1.61
NZL     0.78    0.69    0.70    0.69    0.70    0.37
ZAF     0.80    0.72    0.82    0.80    0.71    0.77    8.78
NLD     0.70    0.83    0.84    0.89    0.88    0.70    0.78    4.66
USA     0.69    0.70    0.74    0.77    0.91    0.69    0.71    0.87    1.01
CHE     0.76    0.87    0.91    0.89    0.84    0.71    0.81    0.90    0.84   13.06

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JER   ang
------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     USA     ZAF     NLD     CHE
AUS     0.33
CAN     0.66    7.57
DFS     0.70    0.82   13.23
GBR     0.79    0.82    0.87    1.23
ITA     0.73    0.85    0.82    0.86    1.59
USA     0.70    0.83    0.86    0.83    0.80    1.01
ZAF     0.62    0.63    0.67    0.81    0.82    0.67    8.68
NLD     0.72    0.82    0.73    0.82    0.79    0.73    0.65    6.21
CHE     0.63    0.79    0.71    0.72    0.74    0.72    0.65    0.74    9.47

------------------------------------------------------------------------------
JER   ran
------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS     0.36
CAN     0.89    5.84
DFS     0.89    0.97   11.54
GBR     0.94    0.95    0.95    1.21
ITA     0.88    0.95    0.94    0.95    1.70
NZL     0.90    0.88    0.88    0.92    0.88    0.30
USA     0.89    0.95    0.96    0.97    0.94    0.91    1.24
ZAF     0.89    0.89    0.89    0.89    0.88    0.88    0.88    8.94
NLD     0.90    0.96    0.96    0.96    0.94    0.89    0.95    0.91    4.68
CHE     0.91    0.96    0.95    0.95    0.94    0.89    0.94    0.89    0.95   12.75

------------------------------------------------------------------------------
JER   rwi
------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS     0.32
CAN     0.80    6.31
DFS     0.81    0.91   12.07
GBR     0.80    0.92    0.86    1.38
ITA     0.77    0.85    0.82    0.85    1.46
NZL     0.88    0.83    0.82    0.80    0.79    0.30
USA     0.77    0.82    0.81    0.84    0.87    0.78    0.99
ZAF     0.77    0.78    0.79    0.80    0.78    0.77    0.78    9.24
NLD     0.85    0.94    0.91    0.88    0.80    0.80    0.81    0.80    5.02
CHE     0.83    0.93    0.84    0.87    0.80    0.80    0.80    0.78    0.92   12.96
```

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--------------------------------------------------------------------------------
JER    rls
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.18
CAN    0.67   6.12
DFS    0.68   0.91  12.64
GBR    0.72   0.85   0.76   1.75
ITA    0.67   0.86   0.82   0.80   1.93
NZL    0.66   0.67   0.67   0.69   0.68   0.12
USA    0.67   0.94   0.89   0.87   0.86   0.66   0.87
ZAF    0.71   0.68   0.68   0.76   0.68   0.83   0.72  11.86
NLD    0.72   0.92   0.91   0.85   0.85   0.67   0.86   0.74   3.61
CHE    0.75   0.92   0.85   0.82   0.81   0.69   0.86   0.72   0.90   9.33

--------------------------------------------------------------------------------
JER    rlr
--------------------------------------------------------------------------------
        AUS    CAN    DFS    ITA    ZAF    NLD    USA    CHE
AUS    0.21
CAN    0.52   6.53
DFS    0.54   0.78  13.66
ITA    0.56   0.82   0.71   1.55
ZAF    0.52   0.55   0.52   0.55  12.46
NLD    0.57   0.86   0.89   0.73   0.63   4.72
USA    0.50   0.72   0.63   0.83   0.52   0.74   0.87
CHE    0.64   0.68   0.62   0.62   0.55   0.70   0.58  12.15

--------------------------------------------------------------------------------
JER    fan
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    USA    ZAF    NLD    CHE
AUS    0.22
CAN    0.62   6.24
DFS    0.63   0.87  12.74
GBR    0.71   0.79   0.76   1.51
ITA    0.62   0.74   0.69   0.71   1.50
USA    0.62   0.88   0.80   0.85   0.79   0.87
ZAF    0.65   0.65   0.68   0.84   0.66   0.75   9.64
NLD    0.68   0.75   0.78   0.86   0.72   0.77   0.71   3.96
CHE    0.66   0.80   0.81   0.70   0.70   0.73   0.67   0.73  12.11

--------------------------------------------------------------------------------
JER    fua
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.37
CAN    0.73   5.70
DFS    0.70   0.86  12.84
GBR    0.76   0.94   0.86   1.63
ITA    0.68   0.86   0.74   0.87   1.52
NZL    0.79   0.71   0.73   0.81   0.69   0.42
USA    0.74   0.94   0.86   0.92   0.90   0.71   1.46
ZAF    0.71   0.91   0.87   0.93   0.78   0.74   0.89  11.86
NLD    0.75   0.91   0.89   0.92   0.83   0.81   0.87   0.86   4.67
CHE    0.78   0.91   0.85   0.87   0.78   0.71   0.86   0.88   0.90  12.05

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JER    ruh
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.35
CAN    0.72   6.88
DFS    0.74   0.84  10.65
GBR    0.80   0.79   0.83   1.32
ITA    0.74   0.72   0.80   0.83   1.44
NZL    0.72   0.72   0.76   0.76   0.81   0.41
USA    0.77   0.84   0.90   0.91   0.84   0.74   1.24
```

```
ZAF      0.81    0.72    0.79    0.87    0.85    0.77    0.84    9.19
NLD      0.74    0.76    0.91    0.88    0.83    0.81    0.86    0.78    4.30
CHE      0.78    0.92    0.85    0.83    0.72    0.77    0.85    0.76    0.83   12.82
```

JER   usu

```
         AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS      0.38
CAN      0.74    6.47
DFS      0.71    0.84   13.48
GBR      0.79    0.87    0.85    1.74
ITA      0.65    0.76    0.76    0.84    1.77
NZL      0.59    0.59    0.59    0.63    0.64    0.40
USA      0.73    0.82    0.89    0.84    0.82    0.60    0.97
ZAF      0.76    0.78    0.73    0.80    0.66    0.59    0.77   10.06
NLD      0.81    0.83    0.88    0.91    0.79    0.60    0.88    0.79    4.85
CHE      0.75    0.90    0.86    0.80    0.80    0.61    0.83    0.78    0.86   10.21
```

JER   ude

```
         AUS     CAN     DFS     GBR     ITA     USA     ZAF     NLD     CHE
AUS      0.35
CAN      0.91    5.39
DFS      0.89    0.93   12.16
GBR      0.89    0.97    0.92    1.46
ITA      0.91    0.95    0.94    0.94    1.66
USA      0.88    0.96    0.95    0.94    0.96    1.76
ZAF      0.88    0.89    0.90    0.90    0.88    0.89   10.38
NLD      0.90    0.96    0.95    0.96    0.95    0.95    0.91    4.16
CHE      0.93    0.95    0.94    0.92    0.95    0.94    0.89    0.96    9.97
```

JER   ftp

```
         AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS      0.46
CAN      0.89    6.37
DFS      0.88    0.92   12.78
GBR      0.90    0.94    0.89    1.36
ITA      0.87    0.87    0.86    0.86    1.68
NZL      0.87    0.92    0.87    0.88    0.87    0.30
USA      0.86    0.95    0.91    0.93    0.86    0.88    1.31
ZAF      0.87    0.93    0.87    0.92    0.87    0.90    0.90   10.15
NLD      0.93    0.97    0.94    0.94    0.86    0.90    0.90    0.90    5.52
CHE      0.92    0.95    0.92    0.90    0.87    0.88    0.90    0.88    0.96    9.88
```

JER   ftl

```
         AUS     CAN     DFS     GBR     ITA     USA     ZAF     NLD     CHE     NZL
AUS      0.33
CAN      0.91    5.54
DFS      0.92    0.91   13.85
GBR      0.91    0.93    0.94    1.49
ITA      0.90    0.92    0.91    0.93    1.71
USA      0.90    0.92    0.94    0.97    0.92    1.09
ZAF      0.91    0.91    0.92    0.95    0.90    0.96   10.86
NLD      0.93    0.93    0.97    0.97    0.92    0.95    0.93    4.61
CHE      0.92    0.92    0.94    0.96    0.90    0.94    0.93    0.96   11.45
NZL      0.92    0.94    0.92    0.94    0.91    0.93    0.93    0.92    0.92    0.52
```

JER   rtp

```
         AUS     CAN     DFS     NZL     ZAF     NLD     USA     CHE
AUS      0.32
CAN      0.87    6.32
```

```
DFS      0.87    0.94   13.17
NZL      0.87    0.96    0.91    0.42
ZAF      0.87    0.91    0.88    0.87    9.37
NLD      0.90    0.97    0.95    0.92    0.88    4.99
USA      0.87    0.92    0.95    0.87    0.87    0.94    1.34
CHE      0.90    0.97    0.95    0.94    0.92    0.96    0.92   10.86

------------------------------------------------------------------------------------
JER    ocs
------------------------------------------------------------------------------------
         AUS     CAN    DFS     GBR     ITA     NZL     USA     NLD     CHE
AUS      0.78
CAN      0.55    5.29
DFS      0.51    0.63   12.65
GBR      0.63    0.76    0.82    2.68
ITA      0.48    0.71    0.72    0.79    1.32
NZL      0.62    0.56    0.46    0.55    0.54    0.30
USA      0.63    0.79    0.69    0.85    0.78    0.57    0.87
NLD      0.58    0.73    0.85    0.87    0.79    0.63    0.82    3.06
CHE      0.57    0.84    0.75    0.89    0.80    0.53    0.76    0.82    7.95

------------------------------------------------------------------------------------
JER    ous
------------------------------------------------------------------------------------
         AUS     CAN    DFS     GBR     NZL     USA     NLD     CHE
AUS      0.78
CAN      0.68    6.38
DFS      0.65    0.82   12.90
GBR      0.73    0.81    0.70    1.43
NZL      0.81    0.73    0.68    0.74    0.44
USA      0.68    0.89    0.79    0.84    0.71    0.98
NLD      0.68    0.88    0.88    0.77    0.79    0.86    4.43
CHE      0.75    0.88    0.80    0.86    0.78    0.86    0.92   10.73

------------------------------------------------------------------------------------
JER    ofl
------------------------------------------------------------------------------------
         AUS     CAN    DFS     GBR     ITA     USA     NLD     CHE
AUS      6.32
CAN      0.48    5.02
DFS      0.38    0.73   13.65
GBR      0.59    0.63    0.64    1.33
ITA      0.44    0.63    0.59    0.70    1.07
USA      0.60    0.65    0.61    0.64    0.77    1.40
NLD      0.43    0.68    0.64    0.72    0.67    0.65    4.75
CHE      0.53    0.83    0.70    0.70    0.68    0.77    0.70   10.82

------------------------------------------------------------------------------------
RDC    sta
------------------------------------------------------------------------------------
         AUS     CAN    DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS      0.66
CAN      0.88    6.23
DEU      0.89    0.97   13.46
DFS      0.87    0.96    0.97    8.65
GBR      0.92    0.96    0.96    0.93    1.29
NOR      0.87    0.93    0.94    0.98    0.92   13.62
NZL      0.89    0.89    0.86    0.89    0.92    0.92    0.49
USA      0.90    0.97    0.96    0.94    0.97    0.91    0.89    2.34
NLD      0.88    0.95    0.97    0.97    0.94    0.96    0.84    0.93    4.71
CAM      0.92    0.90    0.91    0.91    0.91    0.91    0.91    0.90    0.90    6.14
LVA      0.86    0.85    0.86    0.92    0.84    0.90    0.86    0.84    0.86    0.90    0.64

------------------------------------------------------------------------------------
RDC    cwi
------------------------------------------------------------------------------------
         AUS     CAN    DEU     DFS     GBR     NZL     USA     NLD     CAM     NOR     LVA
AUS      0.40
CAN      0.73    7.06
```

```
DEU    0.71    0.88   11.30
DFS    0.77    0.81    0.89   13.69
GBR    0.82    0.88    0.89    0.87    1.58
NZL    0.80    0.69    0.71    0.68    0.81    0.35
USA    0.66    0.84    0.81    0.83    0.83    0.71    1.28
NLD    0.72    0.92    0.92    0.89    0.91    0.69    0.81    4.72
CAM    0.77    0.79    0.79    0.79    0.79    0.80    0.79    0.79    6.78
NOR    0.81    0.79    0.81    0.88    0.81    0.81    0.82    0.87    0.80   14.30
LVA    0.68    0.73    0.68    0.66    0.67    0.70    0.66    0.73    0.79    0.80    0.30


--------------------------------------------------------------------------------
RDC    bde
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS    0.49
CAN    0.80    5.94
DEU    0.77    0.87    9.85
DFS    0.78    0.83    0.92   11.88
GBR    0.78    0.86    0.92    0.89    1.55
NOR    0.78    0.81    0.81    0.89    0.83   14.93
NZL    0.77    0.70    0.72    0.74    0.75    0.81    0.35
USA    0.71    0.76    0.89    0.83    0.89    0.83    0.73    1.29
NLD    0.70    0.83    0.90    0.85    0.91    0.85    0.69    0.90    4.25
CAM    0.83    0.82    0.84    0.83    0.83    0.83    0.85    0.83    0.83    5.37
LVA    0.74    0.77    0.80    0.81    0.78    0.84    0.75    0.69    0.73    0.83    0.35


--------------------------------------------------------------------------------
RDC    ang
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     USA     NLD     CAM     NOR     LVA
AUS    0.47
CAN    0.65    6.89
DEU    0.64    0.71   12.61
DFS    0.70    0.76    0.74    9.10
GBR    0.77    0.81    0.70    0.83    1.37
USA    0.69    0.86    0.73    0.81    0.86    1.18
NLD    0.73    0.81    0.62    0.75    0.82    0.74    5.00
CAM    0.81    0.77    0.79    0.79    0.79    0.79    0.79    7.26
NOR    0.73    0.76    0.79    0.63    0.77    0.78    0.72    0.77   16.02
LVA    0.66    0.64    0.63    0.62    0.63    0.62    0.64    0.77    0.77    0.29


--------------------------------------------------------------------------------
RDC    ran
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS    0.42
CAN    0.90    6.07
DEU    0.91    0.97    9.06
DFS    0.90    0.94    0.95   10.03
GBR    0.93    0.97    0.97    0.95    1.55
NOR    0.90    0.94    0.90    0.91    0.93   12.09
NZL    0.92    0.91    0.89    0.88    0.92    0.93    0.28
USA    0.90    0.98    0.96    0.94    0.97    0.94    0.91    1.63
NLD    0.91    0.97    0.98    0.96    0.97    0.95    0.88    0.96    5.79
CAM    0.93    0.93    0.93    0.93    0.93    0.93    0.93    0.93    0.93    5.42
LVA    0.89    0.92    0.92    0.91    0.91    0.89    0.89    0.91    0.92    0.92    0.41

--------------------------------------------------------------------------------
RDC    rwi
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NZL     USA     NLD     CAM     NOR     LVA
AUS    0.47
CAN    0.85    5.96
DEU    0.81    0.95    9.86
DFS    0.80    0.93    0.93   10.51
GBR    0.84    0.92    0.90    0.88    1.42
NZL    0.83    0.89    0.82    0.88    0.90    0.33
USA    0.78    0.91    0.86    0.89    0.94    0.87    1.41
NLD    0.84    0.94    0.96    0.93    0.89    0.83    0.81    6.21
```

```
CAM    0.86    0.87    0.87    0.88    0.87    0.88    0.87    0.88    6.64
NOR    0.84    0.88    0.85    0.94    0.87    0.88    0.88    0.89    0.87   13.83
LVA    0.79    0.82    0.82    0.85    0.78    0.81    0.77    0.82    0.86    0.87    0.41


--------------------------------------------------------------------------------
RDC    rls
--------------------------------------------------------------------------------
       AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS    0.23
CAN    0.70    6.51
DEU    0.73    0.94    9.28
DFS    0.69    0.97    0.94    9.28
GBR    0.79    0.77    0.85    0.78    1.57
NOR    0.73    0.87    0.85    0.94    0.80   11.82
NZL    0.68    0.67    0.68    0.67    0.70    0.74    0.12
USA    0.70    0.92    0.93    0.93    0.82    0.83    0.67    0.89
NLD    0.73    0.92    0.93    0.89    0.86    0.80    0.66    0.90    5.16
CAM    0.83    0.80    0.80    0.80    0.80    0.80    0.79    0.80    0.80    6.84
LVA    0.70    0.78    0.83    0.75    0.75    0.72    0.72    0.78    0.82    0.80    0.28


--------------------------------------------------------------------------------
RDC    rlr
--------------------------------------------------------------------------------
       AUS     CAN     DEU     DFS     NOR     NLD     USA     CAM     LVA
AUS    0.20
CAN    0.58    6.58
DEU    0.61    0.87   10.36
DFS    0.56    0.82    0.90   10.93
NOR    0.59    0.76    0.80    0.83   13.26
NLD    0.58    0.87    0.90    0.88    0.81    4.79
USA    0.55    0.72    0.77    0.67    0.71    0.80    0.89
CAM    0.74    0.72    0.73    0.72    0.71    0.71    0.71    6.96
LVA    0.61    0.73    0.77    0.79    0.65    0.70    0.71    0.73    0.24


--------------------------------------------------------------------------------
RDC    fan
--------------------------------------------------------------------------------
       AUS     CAN     DEU     DFS     GBR     NOR     USA     NLD     CAM     LVA
AUS    0.29
CAN    0.64    6.32
DEU    0.69    0.81   13.74
DFS    0.63    0.70    0.80    9.34
GBR    0.74    0.79    0.91    0.73    1.59
NOR    0.68    0.73    0.84    0.62    0.77   12.88
USA    0.68    0.85    0.84    0.71    0.83    0.77    1.05
NLD    0.68    0.75    0.89    0.78    0.88    0.67    0.80    4.97
CAM    0.77    0.78    0.77    0.77    0.77    0.77    0.78    0.78    7.98
LVA    0.70    0.65    0.68    0.63    0.69    0.71    0.69    0.67    0.78    0.27


--------------------------------------------------------------------------------
RDC    fua
--------------------------------------------------------------------------------
       AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS    0.38
CAN    0.77    5.62
DEU    0.74    0.90   12.44
DFS    0.72    0.80    0.84   11.69
GBR    0.77    0.88    0.95    0.86    1.53
NOR    0.70    0.82    0.76    0.85    0.80   12.04
NZL    0.77    0.81    0.81    0.70    0.78    0.72    0.36
USA    0.75    0.93    0.90    0.85    0.92    0.80    0.84    1.47
NLD    0.76    0.92    0.93    0.88    0.93    0.88    0.84    0.88    3.97
CAM    0.82    0.81    0.79    0.80    0.79    0.80    0.79    0.81    0.81    6.67
LVA    0.68    0.75    0.76    0.80    0.74    0.75    0.73    0.70    0.76    0.78    0.35


--------------------------------------------------------------------------------
RDC    ruh
--------------------------------------------------------------------------------
       AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
```

```
AUS     0.47
CAN     0.78   5.72
DEU     0.80   0.87   14.66
DFS     0.78   0.87    0.89   10.74
GBR     0.79   0.75    0.85    0.85    1.44
NOR     0.76   0.84    0.88    0.88    0.82   12.26
NZL     0.83   0.74    0.82    0.77    0.92    0.77    0.33
USA     0.77   0.84    0.90    0.92    0.89    0.84    0.84    1.33
NLD     0.75   0.75    0.91    0.91    0.88    0.91    0.83    0.86    4.12
CAM     0.84   0.83    0.82    0.84    0.84    0.83    0.84    0.83    0.82    6.60
LVA     0.74   0.73    0.76    0.84    0.72    0.75    0.74    0.73    0.76    0.82    0.39

-------------------------------------------------------------------------------
RDC     usu
-------------------------------------------------------------------------------
         AUS    CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS     0.34
CAN     0.75   5.75
DEU     0.72   0.89   12.64
DFS     0.66   0.76    0.78   13.07
GBR     0.80   0.80    0.75    0.79    1.85
NOR     0.66   0.71    0.67    0.73    0.76   12.03
NZL     0.68   0.71    0.62    0.60    0.68    0.69    0.32
USA     0.78   0.82    0.75    0.85    0.89    0.77    0.70    1.18
NLD     0.78   0.83    0.80    0.90    0.92    0.80    0.58    0.91    4.56
CAM     0.80   0.78    0.76    0.76    0.78    0.76    0.78    0.78    0.77    6.16
LVA     0.63   0.65    0.62    0.60    0.75    0.68    0.68    0.70    0.68    0.76    0.32

-------------------------------------------------------------------------------
RDC     ude
-------------------------------------------------------------------------------
         AUS    CAN     DEU     DFS     GBR     NOR     USA     NLD     CAM     LVA
AUS     0.53
CAN     0.88   5.62
DEU     0.90   0.97   12.65
DFS     0.89   0.96    0.94   10.66
GBR     0.89   0.96    0.96    0.93    1.83
NOR     0.90   0.91    0.90    0.88    0.92   14.23
USA     0.88   0.96    0.96    0.95    0.96    0.92    1.30
NLD     0.90   0.97    0.97    0.95    0.97    0.90    0.96    4.13
CAM     0.93   0.93    0.93    0.93    0.93    0.92    0.93    0.93    4.47
LVA     0.89   0.89    0.88    0.91    0.88    0.89    0.88    0.88    0.92    0.42

-------------------------------------------------------------------------------
RDC     ftp
-------------------------------------------------------------------------------
         AUS    CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS     0.54
CAN     0.92   5.65
DEU     0.93   0.97   12.99
DFS     0.89   0.94    0.93   11.92
GBR     0.91   0.93    0.94    0.89    1.49
NOR     0.89   0.92    0.89    0.94    0.91   14.17
NZL     0.92   0.90    0.90    0.87    0.89    0.89    0.26
USA     0.86   0.92    0.91    0.92    0.93    0.91    0.87    1.43
NLD     0.93   0.98    0.97    0.95    0.94    0.88    0.91    0.90    4.57
CAM     0.91   0.91    0.91    0.91    0.91    0.91    0.91    0.91    0.91    6.75
LVA     0.88   0.87    0.87    0.87    0.87    0.89    0.88    0.86    0.87    0.91    0.38

-------------------------------------------------------------------------------
RDC     ftl
-------------------------------------------------------------------------------
         AUS    CAN     DEU     DFS     GBR     NOR     USA     NLD     CAM     LVA     NZL
AUS     0.56
CAN     0.93   4.98
DEU     0.93   0.94   14.11
DFS     0.92   0.90    0.97   10.59
GBR     0.95   0.93    0.98    0.93    1.40
NOR     0.91   0.92    0.92    0.93    0.93   12.51
```

```
USA     0.94    0.93    0.96    0.92    0.97    0.93    1.64
NLD     0.93    0.93    0.98    0.97    0.97    0.95    0.95    5.27
CAM     0.94    0.93    0.94    0.93    0.93    0.93    0.94    0.94    7.19
LVA     0.90    0.91    0.90    0.90    0.90    0.94    0.89    0.90    0.93    0.48
NZL     0.94    0.93    0.92    0.92    0.93    0.93    0.92    0.92    0.94    0.91    0.37
```

RDC   rtp

	AUS	CAN	DEU	DFS	NOR	NZL	NLD	USA	CAM	LVA
AUS	0.39									
CAN	0.89	5.87								
DEU	0.89	0.96	14.14							
DFS	0.87	0.93	0.96	12.30						
NOR	0.89	0.90	0.89	0.87	13.10					
NZL	0.92	0.95	0.93	0.88	0.89	0.34				
NLD	0.90	0.98	0.97	0.96	0.88	0.94	5.36			
USA	0.88	0.91	0.95	0.92	0.92	0.89	0.96	1.43		
CAM	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	6.25	
LVA	0.91	0.91	0.89	0.88	0.88	0.90	0.92	0.88	0.91	0.38

RDC   ocs

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD	CAM
AUS	1.11									
CAN	0.63	4.79								
DEU	0.57	0.76	20.53							
DFS	0.64	0.61	0.77	10.51						
GBR	0.66	0.74	0.90	0.75	1.62					
NOR	0.57	0.69	0.69	0.76	0.76	16.28				
NZL	0.73	0.57	0.61	0.50	0.65	0.61	0.27			
USA	0.62	0.77	0.86	0.73	0.88	0.75	0.69	0.56		
NLD	0.60	0.72	0.88	0.82	0.88	0.71	0.64	0.85	3.06	
CAM	0.72	0.76	0.76	0.77	0.77	0.76	0.73	0.79	0.78	6.40

RDC   ous

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD	CAM
AUS	1.45									
CAN	0.71	5.39								
DEU	0.75	0.88	17.23							
DFS	0.67	0.79	0.82	10.79						
GBR	0.83	0.79	0.83	0.72	1.60					
NOR	0.72	0.80	0.80	0.79	0.82	13.76				
NZL	0.83	0.81	0.79	0.74	0.81	0.75	0.36			
USA	0.75	0.88	0.86	0.85	0.87	0.83	0.87	0.98		
NLD	0.69	0.88	0.91	0.88	0.77	0.80	0.81	0.85	3.87	
CAM	0.83	0.83	0.83	0.82	0.84	0.82	0.85	0.84	0.85	6.71

RDC   ofl

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD	CAM
AUS	0.63								
CAN	0.38	4.42							
DEU	0.41	0.75	16.30						
DFS	0.38	0.80	0.81	13.64					
GBR	0.50	0.68	0.73	0.67	1.40				
NOR	0.48	0.70	0.67	0.58	0.76	12.98			
USA	0.54	0.61	0.74	0.63	0.69	0.75	1.30		
NLD	0.43	0.68	0.75	0.64	0.74	0.65	0.67	6.42	
CAM	0.65	0.75	0.75	0.75	0.75	0.75	0.76	0.75	7.02

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^LAPPENDIX II. Number of common bulls

BSW

```
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
-------------------------------------------------------------------------------
  CAN    0  131   85  133   40  152  117   23   20
  CHE  115    0  180  482   68  274  532   50   18
  FRA   78  141    0  208   62  101  206   38   14
  ITA  115  423  171    0   90  213  582   67   19
  NLD   32   65   50   71    0   58   83   26   12
  USA  143  243   77  155   44    0  228   23   20
  DEA   99  437  161  500   73  183    0   62   15
  SVN   21   47   39   62   26   21   59    0    6
  GBR   17   16   13   17   10   18   13    4    0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
-------------------------------------------------------------------------------
  CAN    0  123   51  133   33  152  115   23   20
  CHE  108    0  112  427   63  245  469   50   18
  FRA   46   82    0  123   42   62  135   38   10
  ITA  115  369  100    0   82  213  546   67   19
  NLD   28   62   37   67    0   44   77   26   12
  USA  143  210   44  155   35    0  210   23   20
  DEA   98  378  102  463   71  158    0   62   14
  SVN   21   47   39   62   26   21   59    0    6
  GBR   17   16    9   17   10   18   13    4    0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  DEA  SVN  GBR  USA
-------------------------------------------------------------------------------
  CAN    0  131   85  133   33  117   23   20  152
  CHE  115    0  180  482   67  532   49   18  274
  FRA   78  141    0  208   56  206   37   14  101
  ITA  115  423  171    0   82  582   66   19  213
  NLD   28   65   47   67    0   78   25   12   44
  DEA   99  437  161  500   72    0   60   15  228
  SVN   21   46   38   61   25   56    0    6   22
  GBR   17   16   13   17   10   13    4    0   20
  USA  143  243   77  155   35  183   20   18    0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  NLD  USA  GBR
-------------------------------------------------------------------------------
  CAN    0  130   84   21  151   20
  CHE  115    0  174   44  272   18
  FRA   77  137    0   38  100   14
  NLD   18   45   33    0   29    9
  USA  142  243   76   24    0   20
  GBR   17   16   13    7   18    0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
-------------------------------------------------------------------------------
  CAN    0  131   85  133   40  152  117   23   20
  CHE  115    0  180  482   68  274  532   50   18
  FRA   78  141    0  208   62  101  206   38   14
```

```
   ITA  115   423   171     0    90   213   582    67    19
   NLD   32    65    50    71     0    58    83    26    12
   USA  143   243    77   155    44     0   228    23    20
   DEA   99   437   161   500    73   183     0    62    15
   SVN   21    47    39    62    26    21    59     0     6
   GBR   17    16    13    17    10    18    13     4     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  NLD  USA  DEA  GBR  SVN  ITA
------------------------------------------------------------------------------

   CAN    0   131    51    40   152   117    20    23   129
   CHE  115     0   112    68   274   532    18    49   475
   FRA   46    82     0    42    62   135    10    37   123
   NLD   32    65    37     0    58    83    12    25    88
   USA  143   243    44    44     0   228    20    22   199
   DEA   99   437   103    73   183     0    15    60   576
   GBR   17    16     9    10    18    13     0     6    19
   SVN   21    46    38    25    20    56     4     0    66
   ITA  112   417   100    70   141   492    17    61     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
------------------------------------------------------------------------------

   CAN    0   131    85   133    40   152   117    23    20
   CHE  115     0   180   482    68   274   532    50    18
   FRA   78   141     0   208    62   101   206    38    14
   ITA  115   423   171     0    90   213   582    67    19
   NLD   32    65    50    71     0    58    83    26    12
   USA  143   243    77   155    44     0   228    23    20
   DEA   99   437   161   500    73   183     0    62    15
   SVN   21    47    39    62    26    21    59     0     6
   GBR   17    16    13    17    10    18    13     4     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
------------------------------------------------------------------------------

   CAN    0   131    85   133    32   152   117    23    20
   CHE  115     0   180   482    66   274   532    50    18
   FRA   78   141     0   208    56   101   206    38    14
   ITA  115   423   171     0    81   213   582    67    19
   NLD   27    64    47    66     0    43    77    26    12
   USA  143   243    77   155    33     0   228    23    20
   DEA   99   437   161   500    71   183     0    62    15
   SVN   21    47    39    62    26    21    59     0     6
   GBR   17    16    13    17    10    18    13     4     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  DEA  SVN  USA
------------------------------------------------------------------------------

   CAN    0   131    85   129    32   117    23   152
   CHE  115     0   180   476    66   532    50   274
   FRA   78   141     0   207    56   206    38   101
   ITA  112   418   171     0    80   576    67   199
   NLD   27    64    47    65     0    77    26    43
   DEA   99   437   161   492    71     0    62   228
   SVN   21    47    39    62    26    59     0    23
   USA  143   243    77   141    33   183    21     0
```

```
--------------------------------------------------------------------------------
BSW
--------

 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
 CAN     0  131   51   90   32  152   84   23   20
 CHE   115    0  112  311   67  273  338   50   18
 FRA    46   82    0  115   41   62  125   38   10
 ITA    80  262   93    0   61  115  299   61   16
 NLD    27   65   36   55    0   43   65   26   12
 USA   143  243   44   82   34    0  131   23   20
 DEA    73  271   95  266   60   94    0   61   12
 SVN    21   47   39   57   26   21   58    0    6
 GBR    17   16    9   14   10   18   11    4    0
--------------------------------------------------------------------------------
BSW
--------

 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
 CAN     0  131   85  133   33  152  117   23   20
 CHE   115    0  180  482   67  274  532   50   18
 FRA    78  141    0  208   56  101  206   38   14
 ITA   115  423  171    0   82  213  582   67   19
 NLD    28   65   47   67    0   44   78   26   12
 USA   143  243   77  155   35    0  228   23   20
 DEA    99  437  161  500   72  183    0   62   15
 SVN    21   47   39   62   26   21   59    0    6
 GBR    17   16   13   17   10   18   13    4    0
--------------------------------------------------------------------------------
BSW
--------

 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN
--------------------------------------------------------------------------------
 CAN     0  131   85  133   33  152  117   23
 CHE   115    0  180  482   67  274  532   50
 FRA    78  141    0  208   56  101  206   38
 ITA   115  423  171    0   82  213  582   67
 NLD    28   65   47   67    0   44   78   26
 USA   143  243   77  155   35    0  228   23
 DEA    99  437  161  500   72  183    0   62
 SVN    21   47   39   62   26   21   59    0
--------------------------------------------------------------------------------
BSW
--------

 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
 CAN     0  131   85  133   40  152  117   23   20
 CHE   115    0  180  482   68  274  532   50   18
 FRA    78  141    0  208   62  101  206   38   14
 ITA   115  423  171    0   90  213  582   67   19
 NLD    32   65   50   71    0   58   83   26   12
 USA   143  243   77  155   44    0  228   23   20
 DEA    99  437  161  500   73  183    0   62   15
 SVN    21   47   39   62   26   21   59    0    6
 GBR    17   16   13   17   10   18   13    4    0
--------------------------------------------------------------------------------
BSW
--------

 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
```

```
--------------------------------------------------------------------------------
  CAN    0  131   85  133   40  150  117   23   20
  CHE  115    0  180  482   68  274  532   50   18
  FRA   78  141    0  208   62  101  206   38   14
  ITA  115  423  171    0   90  213  582   67   19
  NLD   32   65   50   71    0   58   83   26   12
  USA  142  243   77  155   44    0  228   23   20
  DEA   99  437  161  500   73  183    0   62   15
  SVN   21   47   39   62   26   21   59    0    6
  GBR   17   16   13   17   10   18   13    4    0
--------------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
        CAN  CHE  FRA  NLD  USA  DEA  SVN  GBR  ITA
--------------------------------------------------------------------------------
  CAN    0  131   85   40  152  106   23   20  121
  CHE  115    0  180   68  274  500   50   18  440
  FRA   78  141    0   62  101  193   38   14  191
  NLD   32   65   50    0   58   77   26   12   80
  USA  143  243   77   44    0  203   23   20  169
  DEA   91  406  151   71  155    0   62   14  488
  SVN   21   47   39   26   21   59    0    6   66
  GBR   17   16   13   10   18   13    4    0   19
  ITA  105  386  157   66  122  427   61   17    0
--------------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
  CAN    0  131   85  133   40  152  117   23   20
  CHE  115    0  180  482   68  274  532   50   18
  FRA   78  141    0  208   62  101  206   38   14
  ITA  115  423  171    0   90  211  582   67   19
  NLD   32   65   50   71    0   58   83   26   12
  USA  143  243   77  154   44    0  228   23   20
  DEA   99  437  161  500   73  183    0   62   15
  SVN   21   47   39   62   26   21   59    0    6
  GBR   17   16   13   17   10   18   13    4    0
--------------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  DEA  SVN  USA
--------------------------------------------------------------------------------
  CAN    0  131   85   90   28   84   23  152
  CHE  115    0  177  311   63  338   50  273
  FRA   78  138    0  139   53  146   38  101
  ITA   80  262  113    0   60  299   61  115
  NLD   24   63   45   55    0   64   26   38
  DEA   73  271  108  266   60    0   61  131
  SVN   21   47   39   57   26   58    0   23
  USA  143  243   77   82   30   94   21    0
--------------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
  CAN    0  123   74  133   40  152   84   23   20
  CHE  108    0  142  426   63  245  333   50   18
  FRA   69  109    0  168   52   84  137   37   14
  ITA  115  367  140    0   88  210  335   66   19
  NLD   32   62   45   71    0   58   65   26   12
```

```
  USA  143  210   64  155   44    0  131   23   20
  DEA   73  267  105  301   60   94    0   60   12
  SVN   21   47   38   61   26   21   57    0    6
  GBR   17   16   13   17   10   18   11    4    0
 ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
 ------------------------------------------------------------------------------
  CAN    0  123   74  133   40  151  117   23   20
  CHE  108    0  142  427   63  245  477   50   18
  FRA   69  109    0  169   52   84  172   38   14
  ITA  115  369  140    0   90  213  575   67   19
  NLD   32   62   45   71    0   58   83   26   12
  USA  142  210   64  155   44    0  226   23   20
  DEA   98  388  134  496   73  179    0   62   15
  SVN   21   47   39   62   26   21   59    0    6
  GBR   17   16   13   17   10   18   13    4    0
 ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
 ------------------------------------------------------------------------------
  CAN    0  123   74  129   40  143  117   23   20
  CHE  108    0  142  426   63  224  477   50   18
  FRA   69  109    0  168   52   75  172   38   14
  ITA  112  368  140    0   88  183  570   67   19
  NLD   32   62   45   70    0   54   83   26   12
  USA  132  190   56  127   39    0  205   19   19
  DEA   98  388  134  489   73  157    0   62   15
  SVN   21   47   39   62   26   17   59    0    6
  GBR   17   16   13   17   10   17   13    4    0
 ------------------------------------------------------------------------------
BSW
--------
BSW
--------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DEA  ITA  SVN  USA  FRA
 ------------------------------------------------------------------------------
  CAN    0  122  116   91   22  153   52
  CHE  107    0  471  311   50  244  112
  DEA   99  385    0  340   61  222  135
  ITA   81  261  291    0   60  115  115
  SVN   21   47   58   56    0   23   37
  USA  143  210  178   82   21    0   62
  FRA   47   82  103   93   38   44    0
 ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DEA  ITA  SVN  FRA
 ------------------------------------------------------------------------------
  CAN    0  129  118  134   23   86
  CHE  114    0  532  482   49  180
  DEA   99  437    0  580   62  205
  ITA  116  423  499    0   66  206
  SVN   21   47   59   62    0   38
  FRA   79  141  161  170   39    0
 ------------------------------------------------------------------------------
BSW
```

```
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  DEA  ITA  SVN  USA  FRA
------------------------------------------------------------------------------
 CAN     0  122   94   91   22  153   52
 CHE   107    0  368  311   50  244  112
 DEA    83  298    0  306   60  159  127
 ITA    81  261  273    0   60  115  115
 SVN    21   47   57   56    0   23   37
 USA   143  210  118   82   21    0   62
 FRA    47   82   97   93   38   44    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CHE  DEA  ITA  SVN  USA  FRA
------------------------------------------------------------------------------
 CHE     0  514  311   49  273  178
 DEA   422    0  339   59  213  200
 ITA   262  290    0   59  115  139
 SVN    46   55   55    0   22   36
 USA   243  167   82   20    0  100
 FRA   140  158  113   37   77    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  DEA  ITA  SVN  USA  FRA
------------------------------------------------------------------------------
 CAN     0   79   68   72   21   85   40
 CHE    68    0  368  311   47  244  112
 DEA    57  298    0  306   56  159  127
 ITA    64  261  273    0   54  115  115
 SVN    20   45   53   51    0   21   36
 USA    76  210  118   82   19    0   62
 FRA    35   82   97   93   37   44    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------------
 CAN     0  129  118  130   23   86
 CHE   114    0  532  476   49  180
 DEA    99  437    0  574   62  205
 ITA   113  418  491    0   66  205
 SVN    21   47   59   62    0   38
 FRA    79  141  161  170   39    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------------
 CHE     0  531  479   49  176
 DEA   436    0  580   62  203
 ITA   420  499    0   66  203
 SVN    47   59   62    0   38
 FRA   138  160  169   39    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
```

```
          CHE  DEA  ITA  SVN  FRA
     ----------------------------------------------------------------------
     CHE    0  304  286   49  125
     DEA  256    0  297   61  145
     ITA  246  266    0   61  136
     SVN   47   58   57    0   38
     FRA   97  107  111   39    0
     ----------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CHE  DEA  ITA  SVN  FRA
     ----------------------------------------------------------------------
     CHE    0  531  473   49  176
     DEA  436    0  574   62  203
     ITA  415  491    0   66  202
     SVN   47   59   62    0   38
     FRA  138  160  169   39    0
     ----------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CHE  DEA  ITA  SVN  FRA
     ----------------------------------------------------------------------
     CHE    0  337  309   49  107
     DEA  270    0  298   61  123
     ITA  260  266    0   61  113
     SVN   47   58   57    0   38
     FRA   80   94   91   39    0
     ----------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN  GBR  USA  AUS
     ----------------------------------------------------------------------
     CAN    0   23   64   19
     GBR   20    0   76   11
     USA   54   75    0   22
     AUS   19    9   19    0
     ----------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN  GBR  USA  AUS
     ----------------------------------------------------------------------
     CAN    0   23   64   19
     GBR   20    0   76   11
     USA   54   75    0   22
     AUS   19    9   19    0
     ----------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN  GBR  USA  AUS
     ----------------------------------------------------------------------
     CAN    0   23   64   19
     GBR   20    0   76   11
     USA   54   75    0   22
     AUS   19    9   19    0
     ----------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
```

```
        CAN  GBR  USA  AUS
------------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  USA  AUS
------------------------------------------------------------------------------
  CAN    0   37   19
  USA   35    0    6
  AUS   19    4    0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
```

```
  USA   54   75    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------
  CAN    0   23   62   18
  GBR   20    0   76   11
  USA   53   75    0   22
  AUS   18    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------
  CAN    0   23   64   19
  GBR   20    0   76   11
  USA   54   75    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  AUS  USA
 -------------------------------------------------------------------------
  CAN    0   19   64
  AUS   19    0   22
  USA   54   19    0
 -------------------------------------------------------------------------
GUE
```

```
 --------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   12   64   19
   GBR    9    0   33    9
   USA   54   31    0   21
   AUS   19    8   18    0
 -------------------------------------------------------------------------------
GUE
 --------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   21   62   18
   GBR   18    0   74   10
   USA   53   73    0   22
   AUS   18    8   19    0
 -------------------------------------------------------------------------------
GUE
 --------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   21   64   19
   GBR   18    0   74   10
   USA   54   73    0   22
   AUS   19    8   19    0
 -------------------------------------------------------------------------------
GUE
 --------
GUE
 --------
HOL
 --------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
 -------------------------------------------------------------------------------
   AUS    0  493  891  455  858  761  631  861  892  674  893 1077  470  574  494  306  565  540   91  423  330  101  490  247
   BEL  422    0  662  524  891  672  596  851  737  680 1035  771  416  581  279  247  429  533   94  403  270  127  503  242
   CAN  805  627    0  828 2042 1163 1315 1455 1602 1795 1359 3230  898 1148  372  375 1175 1100  160  452  706  180  872  499
   CHE  406  523  729    0  970  579  562  680  708  722  820  897  371  537  245  218  387  483   81  357  273  108  434  239
   DEU  574  829 1220  822    0 2061 1437 2305 1834 2329 2546 2820 1024 1719  447  371 1180 1638  238  587  569  285  961  702
   DFS  500  588  850  523 1181    0  960 1573 1346 1290 1650 1665  731 1135  459  383  807 1067  175  546  453  190  772  424
   ESP  482  576  840  462  798  688    0 1239 1092 1290 1098 1542  718  919  321  367  855  874  138  420  502  160  745  389
   FRA  589  838  983  628 1200  862  944    0 1547 1583 1980 2405  852 1494  510  389 1138 1242  165  569  540  186  830  441
   GBR  746  735 1618  706 1215  930  888 1037    0 1534 1672 2128  791 1142  482  394  898 1036  163  743  516  183  836  451
   ITA  557  679 1561  664 1500 1015  963 1012 1313    0 1556 2444  896 1348  328  340  992 1228  195  484  615  232  886  560
   NLD  734 1133 1209  802 1831 1208  937 1262 1395 1316    0 2209  806 1349  610  382  913 1379  203  673  489  210  882  481
   USA  892  656 3247  828 1540 1032 1020 1312 1944 1974 1767    0 1164 1597  542  466 1708 1575  210  583  868  202 1111  689
   HUN  331  339  793  312  684  523  553  572  639  762  611 1053    0  743  273  299  607  839  116  335  440  127  574  332
   POL  369  460  863  387 1110  738  591  914  862 1034 1030 1332  572    0  314  291  755 1108  186  410  508  208  772  505
   NZL  396  216  319  205  308  294  262  296  378  271  543  456  204  193    0  204  319  331   47  336  184   57  283  135
   ZAF  281  212  349  192  293  302  340  319  367  301  345  495  257  217  186    0  308  302   52  237  231   55  315  137
   JPN  292  236  417  228  339  316  322  328  358  378  346  480  247  252  151  197    0  744  110  336  515  120  553  318
   CZE  343  396  758  351 1080  616  599  798  733  918 1168 1182  711  766  216  225  231    0  148  404  491  188  705  427
   EST   45   55   77   38  132  101   59   76   82  101  125  136   67  102   21   22   29   82    0   70   78   53  105  113
   IRL  379  386  425  357  474  437  404  499  797  453  616  540  280  301  275  226  194  302   38    0  206   79  372  177
   KOR  230  190  651  195  337  304  356  321  387  522  336  982  342  369  123  178  245  341   33  144    0   98  429  259
   SVN   70   96  132   79  264  144  111  139  135  199  179  156   90  164   42   37   51  137   27   64   61    0  120  103
   PRT  366  503  869  389  765  658  710  721  763  847  871 1127  547  710  218  299  264  576   65  321  359   95    0  370
   LVA  109  138  294  122  526  241  196  218  257  381  299  583  227  339   70   82   93  265   60  102  152   60  288    0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
    ----------------------------------------------------------------------------------------------------------------------
AUS     0  486  891  455  857  760  642  734  892  674  838 1077  470  572  494  256  563  540   90  423  329  101  493  225
BEL   421    0  656  521  885  665  608  783  729  676  980  754  413  577  275  216  418  531   94  400  269  127  504  223
CAN   805  627    0  828 2040 1163 1324 1294 1602 1795 1285 3230  898 1147  372  322 1171 1100  160  452  701  180  875  473
CHE   406  522  729    0  969  579  571  652  708  722  801  897  371  536  245  197  385  483   81  357  272  108  435  220
DEU   574  829 1220  822    0 2060 1462 2173 1832 2329 2503 2819 1023 1712  446  333 1176 1637  237  586  564  285  961  674
DFS   500  587  850  523 1181    0  983 1404 1344 1290 1571 1664  730 1130  458  329  805 1067  174  544  451  190  776  398
ESP   491  600  849  473  834  712    0 1180 1114 1305 1089 1561  728  939  332  322  858  894  142  435  504  164  764  375
FRA   552  792  928  604 1130  835  950    0 1404 1551 1639 1982  810 1406  427  305  983 1188  160  523  503  186  797  410
GBR   746  735 1618  706 1215  930  918  993    0 1534 1605 2126  791 1140  482  338  895 1036  163  740  513  183  838  423
ITA   557  679 1561  664 1500 1015  984 1001 1313    0 1541 2444  896 1348  328  330  989 1228  195  484  609  232  888  545
NLD   702 1072 1152  778 1802 1184  938 1118 1341 1304    0 1973  785 1325  584  319  840 1360  200  659  467  210  867  447
USA   892  655 3247  828 1540 1031 1037 1116 1944 1974 1523    0 1164 1595  542  397 1704 1575  210  581  861  202 1115  658
HUN   331  339  793  312  684  523  563  560  639  762  594 1053    0  742  273  271  606  839  116  335  436  127  578  315
POL   369  460  863  387 1110  738  614  869  861 1034 1019 1332  572    0  314  265  753 1108  185  410  505  208  775  484
NZL   396  216  319  205  308  294  270  272  378  271  522  456  204  193    0  167  318  331   47  336  183   57  284  117
ZAF   241  195  307  176  273  278  301  272  316  296  286  410  240  209  149    0  261  281   51  200  211   55  299  122
JPN   287  231  411  224  335  312  320  317  351  374  336  472  246  250  149  182    0  743  110  336  511  120  554  300
CZE   343  396  758  351 1080  616  622  767  733  918 1151 1182  711  766  216  213  230    0  148  404  489  188  707  412
EST    45   55   77   38  132  101   63   75   82  101  124  136   67  102   21   22   29   82    0   70   77   53  105  107
IRL   379  386  425  357  474  437  423  480  795  453  602  540  280  301  275  195  193  302   38    0  204   79  373  163
KOR   230  190  649  195  336  304  360  313  386  519  324  974  339  368  123  161  241  341   32  144    0   98  428  248
SVN    70   96  132   79  264  144  116  139  135  199  179  156   90  164   42   37   51  137   27   64   61    0  120  103
PRT   367  505  871  389  765  660  731  711  766  848  859 1128  552  714  218  289  260  578   65  322  358   95    0  353
LVA    99  127  280  112  504  227  192  205  239  371  277  562  214  327   60   74   88  257   55   92  150   60  276    0
    ----------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  PRT  SVN  LVA
    ----------------------------------------------------------------------------------------------------------------------
AUS     0  493  891  455  858  760  633  861  892  674  867 1077  470  574  494  306  564  540   91  423  329  493  101  247
BEL   422    0  662  524  891  671  599  851  737  680 1011  771  416  581  279  247  428  533   94  403  269  505  127  242
CAN   805  627    0  828 2042 1163 1318 1455 1602 1795 1328 3230  898 1148  372  375 1173 1100  160  452  703  875  180  499
CHE   406  523  729    0  970  579  563  681  708  722  814  897  371  537  245  218  386  483   81  357  272  435  107  239
DEU   574  829 1220  822    0 2061 1442 2306 1834 2329 2533 2820 1024 1719  447  371 1179 1638  238  587  567  962  284  702
DFS   500  588  850  523 1181    0  963 1572 1345 1290 1608 1664  730 1134  458  383  806 1067  175  545  451  777  189  424
ESP   483  579  841  464  805  691    0 1244 1094 1294 1087 1545  719  923  323  367  854  878  140  421  500  750  160  391
FRA   589  838  983  629 1201  862  949    0 1547 1583 1865 2405  852 1494  510  389 1137 1242  165  569  538  836  185  441
GBR   746  735 1618  706 1215  930  891 1037    0 1534 1643 2127  791 1142  482  394  897 1036  163  741  515  840  182  451
ITA   557  679 1561  664 1500 1015  967 1012 1313    0 1552 2444  896 1348  328  340  991 1228  195  484  612  888  231  560
NLD   730 1109 1202  801 1829 1207  939 1240 1383 1315    0 2081  797 1340  597  372  878 1374  202  666  481  880  208  476
USA   892  656 3247  828 1540 1031 1022 1312 1944 1974 1725    0 1164 1597  542  466 1706 1575  210  582  864 1115  201  689
HUN   331  339  793  312  684  523  554  572  639  762  611 1053    0  743  273  299  606  839  116  335  439  578  127  332
POL   369  460  863  387 1110  738  594  914  862 1034 1029 1332  572    0  314  291  754 1108  186  410  507  775  207  505
NZL   396  216  319  205  308  294  263  296  378  271  541  456  204  193    0  204  318  331   47  336  183  284   57  135
ZAF   281  212  349  192  293  302  341  319  367  301  343  495  257  217  186    0  308  302   52  237  230  315   54  137
JPN   288  233  413  225  336  313  319  324  354  375  341  475  246  250  149  196    0  744  110  336  512  555  120  318
CZE   343  396  758  351 1080  616  602  798  733  918 1167 1182  711  766  216  225  230    0  148  404  491  708  187  427
EST    45   55   77   38  132  101   60   76   82  101  125  136   67  102   21   22   29   82    0   70   78  105   53  113
IRL   379  386  425  357  474  437  405  499  795  453  613  540  280  301  275  226  193  302   38    0  205  373   79  177
KOR   230  190  650  195  337  304  356  321  387  521  332  977  342  369  123  177  242  341   33  144    0  429   98  259
PRT   367  504  871  389  765  660  715  725  765  848  871 1128  551  714  218  299  262  578   65  322  359    0  120  370
SVN    70   96  132   79  264  144  111  138  135  198  177  156   90  164   42   37   51  137   27   64   61   95    0  103
LVA   109  138  294  122  526  241  198  218  257  381  298  583  227  339   70   82   92  265   60  102  152  288   60    0
    ----------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  PRT  SVN  LVA
    ----------------------------------------------------------------------------------------------------------------------
AUS     0  479  891  439  855  760  645  732  889  674  476 1074  469  569  302  563  540   89  421  329  485   98  247
BEL   419    0  648  496  873  656  605  777  716  674  632  739  407  570  235  413  528   93  393  264  494  124  242
CAN   805  622    0  791 2039 1159 1326 1294 1600 1795  908 3230  898 1146  370 1171 1100  159  451  701  869  176  499
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  CHE  402  498  699    0  879  564  563  643  694  703  556  841  362  515  214  383  460   78  353  270  419  102  234
  DEU  573  826 1220  763    0 2047 1470 2170 1830 2328 1656 2815 1020 1708  365 1175 1636  236  585  564  943  279  702
  DFS  500  585  850  513 1177  721    0  986 1397 1333 1285  954 1654  726 1120  379  802 1065  173  543  451  761  184  423
  ESP  494  603  851  471  851  721    0 1186 1116 1310  744 1566  729  942  369  861  897  143  436  504  762  161  398
  FRA  551  791  928  596 1129  835  963    0 1401 1551 1003 1978  808 1404  341  983 1188  158  521  503  782  180  428
  GBR  746  726 1618  696 1213  929  925  991    0 1534  971 2121  787 1131  388  894 1035  160  732  513  824  177  451
  ITA  557  679 1561  651 1499 1014  992 1000 1310    0 1166 2444  896 1345  335  989 1228  193  484  609  879  228  560
  NLD  449  686  916  528 1423  879  662  849  922 1092    0 1118  503  980  206  470  954  162  382  330  562  196  371
  USA  891  647 3247  775 1539 1030 1039 1114 1942 1973 1012    0 1162 1593  460 1704 1574  209  578  860 1102  197  689
  HUN  331  337  793  307  684  523  567  559  638  762  400 1052    0  740  296  606  839  116  332  436  571  126  332
  POL  369  457  863  367 1110  735  622  869  857 1033  849 1331  572    0  286  753 1105  185  407  505  765  205  505
  ZAF  278  209  346  188  290  299  340  295  364  297  185  490  255  214    0  304  297   49  234  227  309   50  135
  JPN  286  230  410  223  334  311  319  316  350  373  262  471  245  250  192    0  743  110  335  511  551  118  318
  CZE  343  396  758  339 1080  616  626  767  733  918  920 1182  711  766  221  229    0  146  403  489  700  185  427
  EST   45   55   77   38  132  101   65   75   82  101  107  136   67  102   22   29   82    0   68   77  103   53  112
  IRL  379  384  425  353  473  437  427  480  788  453  382  540  280  300  224  192  302   38    0  204  366   77  177
  KOR  230  190  649  194  336  304  360  313  386  519  249  973  339  368  176  241  341   32  144    0  428   97  258
  PRT  367  501  871  379  763  656  732  711  763  846  572 1126  550  707  296  259  578   64  322  358    0  119  367
  SVN   68   95  130   79  260  142  115  136  133  196  175  154   90  164   33   50  137   27   63   61   94    0  101
  LVA  109  138  294  120  526  241  213  215  257  381  239  583  227  339   81   92  265   60  102  152  288   59    0
  ----------------------------------------------------------------------------
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal

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       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
  ----------------------------------------------------------------------------
  AUS    0  493  891  455  858  761  630  861  892  674  893 1077  470  574  494  306  565  540   91  423  330  102  493  247
  BEL  422    0  662  524  891  672  592  851  737  680 1035  771  416  581  279  247  429  533   94  403  270  128  505  242
  CAN  805  627    0  828 2042 1163 1312 1455 1602 1795 1359 3230  898 1148  372  375 1174 1100  160  452  706  181  874  499
  CHE  406  523  729    0  970  579  561  680  708  722  820  897  371  218  387  483   81  357  273  109  435  239
  DEU  574  829 1220  822    0 2061 1428 2305 1834 2329 2546 2820 1024 1719  447  371 1180 1638  238  587  569  286  961  702
  DFS  500  588  850  523 1181    0  954 1573 1346 1290 1650 1665  731 1135  459  383  807 1067  175  546  453  191  776  424
  ESP  481  572  837  460  789  682    0 1233 1086 1284 1092 1535  717  916  319  367  851  872  138  419  501  161  746  388
  FRA  589  838  983  628 1200  861  937    0 1547 1583 1980 2405  852 1494  510  389 1138 1242  165  569  541  187  835  441
  GBR  746  735 1618  706 1215  930  881 1037    0 1534 1672 2128  791 1142  482  394  898 1036  163  743  516  184  840  451
  ITA  557  679 1561  664 1500 1015  956 1012 1313    0 1556 2444  896 1348  328  340  992 1228  195  484  615  233  887  560
  NLD  734 1133 1209  802 1831 1208  930 1262 1395 1316    0 2209  806 1349  610  382  913 1379  203  673  489  211  884  481
  USA  892  656 3247  828 1540 1031 1014 1312 1944 1974 1767    0 1164 1597  542  466 1707 1575  210  583  868  203 1114  689
  HUN  331  339  793  312  684  523  553  572  639  762  611 1053    0  743  273  299  607  839  116  335  440  128  577  332
  POL  369  460  863  387 1110  738  587  914  862 1034 1030 1332  572    0  314  291  755 1108  186  410  508  209  774  505
  NZL  396  216  319  205  308  294  260  296  378  271  543  456  204  193    0  204  319  331   47  336  184   57  284  135
  ZAF  281  212  349  192  293  302  340  319  367  301  345  495  257  217  186    0  308  302   52  237  231   56  315  137
  JPN  291  235  415  227  338  315  321  327  357  377  345  478  246  251  150  196    0  744  110  336  514  121  555  318
  CZE  343  396  758  351 1080  616  597  798  733  918 1168 1182  711  766  216  225  231    0  148  404  491  189  708  427
  EST   45   55   77   38  132  101   59   76   82  101  125  136   67  102   21   22   29   82    0   70   78   53  105  113
  IRL  379  386  425  357  474  437  403  499  797  453  616  540  280  301  275  226  193  302   38    0  206   80  373  177
  KOR  230  190  651  195  337  304  354  321  387  522  336  982  342  369  123  178  244  341   33  144    0   99  429  259
  SVN   71   97  133   80  266  146  112  140  136  201  180  157   91  165   42   37   52  138   27   65   62    0  121  104
  PRT  367  504  871  389  765  660  709  725  765  847  873 1127  550  713  218  299  263  578   65  322  359   95    0  370
  LVA  109  138  294  122  526  241  194  218  257  381  299  583  227  339   70   82   92  265   60  102  152   60  288    0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal

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       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  PRT  SVN  LVA
  ----------------------------------------------------------------------------
  AUS    0  468  891  455  858  761  630  861  892  674  891 1077  470  574  494  306  370  540   91  423  328  493  101  247
  BEL  419    0  642  517  869  651  576  804  706  674  946  724  401  569  264  235  319  519   94  388  260  497  127  241
  CAN  805  617    0  828 2042 1163 1314 1455 1602 1795 1356 3230  898 1148  372  375  872 1100  160  452  702  874  180  499
  CHE  406  519  729    0  970  579  561  681  708  722  820  897  371  537  245  218  324  483   81  357  271  435  107  239
  DEU  574  823 1220  822    0 2061 1431 2306 1834 2329 2544 2820 1024 1719  447  371 1638  238  587  566  961  284  702
  DFS  500  583  850  523 1181    0  957 1573 1346 1290 1642 1665  731 1135  459  383  579 1067  175  546  450  776  189  424
  ESP  481  567  840  460  793  685    0 1235 1089 1287 1091 1538  718  917  320  367  672  873  138  419  499  747  160  388
  FRA  589  825  983  629 1201  862  941    0 1547 1583 1969 2405  852 1494  510  389  795 1242  165  569  537  835  185  441
  GBR  746  718 1618  706 1215  930  885 1037    0 1534 1669 2128  791 1142  482  394  657 1036  163  743  514  840  182  451
  ITA  557  679 1561  664 1500 1015  960 1012 1313    0 1556 2444  896 1348  328  340  883 1228  195  484  611  887  231  560
  NLD  734 1036 1209  802 1830 1208  932 1263 1394 1316    0 2202  806 1348  609  382  667 1379  202  672  483  884  208  480
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  USA  892  641 3247  828 1540 1031 1018 1312 1944 1974 1764    0 1164 1597  542  466 1186 1575  210  583  862 1114  201  689
  HUN  331  335  793  312  684  523  553  572  639  762  611 1053    0  743  273  299  489  839  116  335  438  577  127  332
  POL  369  457  863  387 1110  738  589  914  862 1034 1030 1332  572    0  314  291  651 1108  186  410  506  774  207  505
  NZL  396  210  319  205  308  294  262  296  378  271  543  456  204  193    0  204  206  331   47  336  182  284   57  135
  ZAF  280  209  348  191  292  301  339  318  366  300  344  494  256  216  186    0  210  302   52  237  229  315   54  137
  JPN  251  207  375  208  310  285  278  290  308  355  302  419  218  241  126  151    0  601   98  248  428  439  117  278
  CZE  343  393  758  351 1080  616  598  798  733  918 1168 1182  711  766  216  225  212    0  148  404  490  708  187  427
  EST   45   55   77   38  132  101   59   76   82  101  125  136   67  102   21   22   29   82    0   70   78  105   53  113
  IRL  379  380  425  357  474  437  403  499  797  453  616  540  280  301  275  225  169  302   38    0  204  373   79  177
  KOR  230  190  650  195  337  304  356  321  387  521  335  977  342  369  123  177  229  341   33  144    0  428   98  258
  PRT  367  501  871  389  765  660  711  725  765  847  873 1127  550  713  218  298  233  578   65  322  359    0  120  370
  SVN   70   96  132   79  264  144  111  138  135  198  177  156   90  164   42   37   51  137   27   64   61   95    0  103
  LVA  109  138  294  122  526  241  194  218  257  381  299  583  227  339   70   82   88  265   60  102  152  288   60    0
  -------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
  -------------------------------------------------------------------------------------
  AUS    0  493  891  455  858  761  634  861  892  674  893 1077  470  574  494  306  563  540   91  423  329  102  493  247
  BEL  422    0  662  524  891  672  599  851  737  680 1035  771  416  581  279  247  426  533   94  403  269  128  506  242
  CAN  805  627    0  828 2042 1163 1318 1455 1602 1795 1359 3230  898 1148  372  375 1171 1100  160  452  700  181  877  499
  CHE  406  523  729    0  970  579  563  680  708  722  820  897  371  537  245  218  385  483   81  357  272  109  436  239
  DEU  574  829 1220  822    0 2061 1444 2305 1834 2329 2546 2820 1024 1719  447  371 1177 1638  238  587  565  286  962  702
  DFS  500  588  850  523 1181    0  966 1573 1346 1290 1650 1665  731 1135  459  383  805 1067  175  546  450  191  777  424
  ESP  484  580  841  465  808  693    0 1246 1096 1294 1103 1545  719  924  324  368  853  879  140  422  498  161  751  392
  FRA  589  838  983  628 1200  862  952    0 1547 1583 1980 2405  852 1494  510  389 1135 1242  165  569  536  187  837  441
  GBR  746  735 1618  706 1215  930  893 1037    0 1534 1672 2128  791 1142  482  394  895 1036  163  743  513  184  840  451
  ITA  557  679 1561  664 1500 1015  968 1012 1313    0 1556 2444  896 1348  328  340  989 1228  195  484  609  233  888  560
  NLD  734 1133 1209  802 1831 1208  943 1262 1395 1316    0 2209  806 1349  610  382  910 1379  203  673  482  211  886  481
  USA  892  656 3247  828 1540 1032 1023 1312 1944 1974 1767    0 1164 1597  542  466 1704 1575  210  583  859  203 1117  689
  HUN  331  339  793  312  684  523  555  572  639  762  611 1053    0  743  273  299  606  839  116  335  435  128  578  332
  POL  369  460  863  387 1110  738  595  914  862 1034 1030 1332  572    0  314  291  754 1108  186  410  505  209  775  505
  NZL  396  216  319  205  308  294  264  296  378  271  543  456  204  193    0  204  318  331   47  336  183   57  284  135
  ZAF  281  212  349  192  293  302  342  319  367  301  345  495  257  217  186    0  307  302   52  237  230   56  315  137
  JPN  286  230  410  223  334  311  316  320  350  373  338  471  245  250  148  193    0  743  110  336  511  121  554  318
  CZE  343  396  758  351 1080  616  604  798  733  918 1168 1182  711  766  216  225  229    0  148  404  489  189  708  427
  EST   45   55   77   38  132  101   60   76   82  101  125  136   67  102   21   22   29   82    0   70   77   53  105  113
  IRL  379  386  425  357  474  437  406  499  797  453  616  540  280  301  275  226  192  302   38    0  204   80  373  177
  KOR  230  190  648  195  336  303  354  319  386  519  333  972  338  368  123  177  241  341   32  144    0   99  427  258
  SVN   71   97  133   80  266  146  112  140  136  201  180  157   91  165   42   37   52  138   27   65   62    0  121  104
  PRT  367  506  873  390  765  660  718  727  767  849  876 1132  553  714  218  299  259  579   65  322  359   95    0  371
  LVA  109  138  294  122  526  241  199  218  257  381  299  583  227  339   70   82   92  265   60  102  152   60  289    0
  -------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
  -------------------------------------------------------------------------------------
  AUS    0  448  809  455  855  760  632  611  889  674  800 1076  468  535  258  525  424   90  408  246  101  490  225
  BEL  413    0  613  506  842  622  566  696  676  667  888  693  391  537  207  383  442   91  365  215  127  488  221
  CAN  752  606    0  805 1977 1067 1251 1153 1508 1786 1221 3036  876 1097  312 1049  966  157  422  598  180  857  471
  CHE  406  509  714    0  969  578  566  623  708  722  792  897  369  519  198  378  416   81  350  226  107  432  220
  DEU  574  805 1217  822    0 2059 1447 1972 1830 2329 2480 2817 1019 1680  335 1148 1433  237  569  492  284  959  675
  DFS  500  574  847  523 1181    0  963 1195 1340 1290 1534 1663  726 1082  331  762  877  174  519  364  189  771  398
  ESP  486  567  831  467  816  699    0 1053 1096 1299 1053 1546  721  896  323  819  775  139  412  422  161  755  373
  FRA  490  707  857  566 1087  771  837    0 1196 1473 1447 1638  738 1332  271  833 1007  152  443  423  185  725  394
  GBR  745  698 1545  705 1214  928  901  860    0 1534 1556 2120  788 1096  340  848  880  162  698  427  182  834  424
  ITA  557  676 1560  664 1500 1015  972  971 1313    0 1540 2444  896 1333  332  983 1157  195  478  551  231  887  545
  NLD  675  975 1132  773 1807 1179  907 1041 1317 1307    0 1878  768 1275  315  808 1208  200  610  396  208  857  447
  USA  892  631 3134  828 1540 1031 1027  950 1943 1974 1490    0 1161 1545  400 1572 1366  210  555  728  201 1110  658
  HUN  331  326  787  312  684  523  558  512  638  762  597 1053    0  716  272  591  723  116  321  380  127  577  315
  POL  355  443  842  374 1093  715  573  854  839 1026  995 1302  554    0  252  718 1004  184  373  458  207  753  485
  ZAF  244  194  306  177  274  279  302  244  319  297  287  413  241  201    0  254  240   51  197  165   54  299  122
  JPN  281  228  407  222  333  309  311  300  345  372  331  463  243  243  181    0  632  108  309  425  120  546  298
  CZE  291  340  682  295  963  536  508  641  621  869 1056 1030  602  710  177  213    0  141  323  418  185  633  398
  EST   45   54   77   38  132  101   60   72   82  101  124  136   67  101   22   29   77    0   68   72   53  105  107
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   IRL  377  371  422  354  472  435  409  411  763  451  586  534  278  288  196  191  247   38    0  150   79  359  159
   KOR  171  166  560  169  299  260  292  283  311  470  277  820  290  346  119  208  296   30  110    0   97  370  233
   SVN   70   96  132   79  264  144  112  138  135  198  177  156   90  164   37   51  136   27   64   61    0  120  103
   PRT  364  496  853  387  766  659  722  667  764  850  854 1129  553  702  289  257  518   65  319  314   95    0  354
   LVA   99  127  280  112  505  227  188  203  239  371  278  562  214  327   74   88  252   55   92  141   60  276    0
   ------------------------------------------------------------------------------
HOL
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
      ------------------------------------------------------------------------------
   AUS    0  466  891  455  598  760  642  857  892  674  857 1077  469  573  306  563  540   91  422  328  101  498  247
   BEL  419    0  640  516  694  647  592  797  704  673  939  723  401  568  235  404  519   94  387  261  127  501  240
   CAN  805  617    0  828 1658 1163 1324 1439 1602 1795 1314 3230  897 1146  375 1171 1100  160  452  701  180  882  499
   CHE  406  519  729    0  809  579  571  677  708  720  810  897  371  535  218  385  482   81  357  272  107  439  239
   DEU  468  673 1098  680    0 1461 1190 1679 1384 2063 1941 2114  789 1446  250  864 1272  212  425  471  278  755  642
   DFS  500  583  850  523  997    0  983 1545 1344 1289 1595 1663  729 1132  383  805 1067  175  545  451  189  784  424
   ESP  491  592  849  473  664  711    0 1254 1114 1305 1102 1561  727  937  372  857  893  143  435  504  164  770  396
   FRA  589  820  983  628  976  860  984    0 1532 1583 1811 2365  849 1484  388 1121 1237  163  563  531  185  841  440
   GBR  746  718 1618  706 1005  930  918 1037    0 1534 1627 2125  790 1138  393  894 1036  163  737  514  182  846  451
   ITA  557  679 1561  663 1362 1015  983 1012 1313    0 1545 2444  896 1347  340  989 1228  195  484  609  231  889  560
   NLD  725 1033 1196  800 1523 1205  962 1217 1374 1314    0 2038  790 1326  370  869 1369  202  659  477  208  881  475
   USA  892  641 3247  828 1281 1031 1037 1277 1944 1974 1709    0 1163 1593  466 1703 1575  210  581  859  201 1121  689
   HUN  331  335  793  312  534  522  563  572  639  762  609 1053    0  742  298  606  838  116  334  435  127  581  332
   POL  369  457  863  386  995  737  611  914  861 1034 1022 1332  571    0  290  754 1105  184  408  504  206  778  504
   ZAF  281  210  349  192  201  302  344  319  367  301  339  495  257  217    0  306  302   52  237  230   54  322  137
   JPN  286  229  409  222  289  310  317  318  348  372  334  469  244  249  192    0  743  110  336  510  120  560  318
   CZE  343  393  758  351  880  616  621  798  733  918 1166 1182  711  766  225  228    0  147  404  489  187  710  427
   EST   45   55   77   38  118  101   63   76   82  101  125  136   67  101   22   29   82    0   70   78   53  105  113
   IRL  379  380  425  357  366  437  423  499  791  453  612  540  280  301  226  192  302   38    0  204   79  374  177
   KOR  229  190  648  195  298  304  357  317  386  519  329  967  339  367  177  239  340   33  144    0   97  431  258
   SVN   70   96  132   79  264  144  115  138  135  198  177  156   90  164   37   51  137   27   64   60    0  120  103
   PRT  370  507  877  394  637  665  738  732  775  852  876 1137  559  717  300  258  583   64  323  360   95    0  373
   LVA  109  138  294  122  497  241  206  218  257  381  298  583  227  339   82   92  265   60  102  151   60  289    0
      ------------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
      ------------------------------------------------------------------------------
   AUS    0  486  891  455  858  760  642  815  892  674  838 1077  470  573  494  306  563  540   91  423  329   98  493  247
   BEL  421    0  658  523  887  667  610  831  731  678  982  756  413  578  275  245  419  531   94  401  269  124  505  242
   CAN  805  627    0  828 2041 1163 1324 1383 1602 1795 1285 3230  898 1148  372  375 1171 1100  160  452  704  177  875  499
   CHE  406  522  729    0  970  579  571  678  708  722  801  897  371  537  245  218  385  483   81  357  272  105  435  239
   DEU  574  829 1220  822    0 2061 1463 2287 1834 2329 2505 2820 1024 1718  447  371 1177 1638  238  587  568  281  962  702
   DFS  500  587  850  523 1181    0  983 1499 1345 1290 1571 1664  730 1134  458  383  805 1067  175  545  452  186  777  424
   ESP  491  600  849  473  833  711    0 1234 1115 1305 1089 1561  728  939  332  372  858  893  143  435  506  161  764  396
   FRA  588  834  978  627 1199  859  981    0 1497 1578 1778 2213  839 1484  482  376 1062 1231  163  555  524  182  828  436
   GBR  746  735 1618  706 1215  930  918 1029    0 1534 1606 2127  791 1142  482  394  895 1036  163  741  515  179  840  451
   ITA  557  679 1561  664 1500 1015  983 1011 1313    0 1541 2444  896 1348  328  340  989 1228  195  484  613  229  888  560
   NLD  702 1072 1153  778 1802 1183  936 1194 1342 1304    0 1975  785 1327  584  363  840 1360  200  659  470  206  867  471
   USA  892  655 3247  828 1540 1032 1037 1242 1944 1974 1523    0 1164 1597  542  466 1704 1575  210  582  865  199 1115  689
   HUN  331  339  793  312  684  523  563  570  639  762  594 1053    0  743  273  299  606  839  116  335  440  126  578  332
   POL  369  460  863  387 1110  738  612  913  862 1034 1021 1332  572    0  314  291  754 1108  186  410  504  206  775  505
   NZL  396  216  319  205  308  294  270  295  378  271  522  456  204  193    0  204  318  331   47  336  183   56  284  135
   ZAF  281  212  349  192  293  302  344  318  367  301  325  495  257  217  186    0  307  302   52  237  230   54  315  137
   JPN  286  230  410  223  334  311  319  320  350  373  335  471  245  250  148  193    0  743  110  336  511  118  554  318
   CZE  343  396  758  351 1080  616  621  795  733  918 1151 1182  711  766  216  225  229    0  148  404  491  187  708  427
   EST   45   55   77   38  132  101   63   76   82  101  124  136   67  102   21   22   29   82    0   70   78   53  105  113
   IRL  379  386  425  357  474  437  423  495  795  453  601  540  280  301  275  226  192  302   38    0  205   77  373  177
   KOR  230  190  650  195  337  304  360  321  387  521  325  977  342  369  123  177  241  341   33  144    0   97  429  259
   SVN   68   95  130   79  261  143  114  138  133  197  178  154   90  164   41   36   50  137   27   63   61    0  119  101
   PRT  367  505  871  389  765  660  731  723  766  848  859 1128  552  714  218  299  259  578   65  322  359   94    0  370
   LVA  109  138  294  122  526  241  206  218  257  381  295  583  227  339   70   82   92  265   60  102  152   59  288    0
      ------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
     ----------------------------------------------------------------------------------------------------------------------
AUS    0  486  891  455  858  714  635  857  892  674  867 1077  470  574  494  306  564  540   91  423  329  101  492  247
BEL  421    0  658  523  887  656  598  837  731  678  996  756  413  578  275  245  420  531   94  401  269  127  504  242
CAN  805  627    0  828 2042 1085 1319 1440 1602 1795 1328 3230  898 1148  372  375 1172 1100  160  452  704  180  873  499
CHE  406  522  729    0  970  575  565  680  708  722  814  897  371  537  245  218  385  483   81  357  272  108  435  239
DEU  574  829 1220  822    0 2007 1446 2301 1834 2329 2533 2820 1024 1719  447  371 1178 1638  238  587  568  285  960  702
DFS  500  587  850  523 1181    0  925 1462 1287 1284 1574 1571  714 1114  431  356  752 1033  173  528  439  190  767  420
ESP  484  581  842  466  809  694    0 1236 1098 1295 1090 1547  720  926  325  370  855  880  140  423  502  160  750  393
FRA  589  837  983  628 1199  861  955    0 1534 1583 1858 2366  850 1491  506  388 1123 1237  164  564  535  186  832  440
GBR  746  734 1617  706 1214  929  892 1035    0 1534 1643 2127  791 1142  482  394  896 1036  163  741  515  183  838  451
ITA  557  679 1561  664 1500 1014  969 1012 1312    0 1552 2444  896 1348  328  340  990 1228  195  484  613  232  887  560
NLD  730 1103 1202  801 1829 1207  942 1238 1382 1315    0 2081  797 1340  597  372  877 1374  202  666  482  210  879  476
USA  892  655 3247  828 1540 1031 1024 1277 1944 1974 1725    0 1164 1597  542  466 1705 1575  210  582  866  202 1113  689
HUN  331  339  793  312  684  523  556  572  639  762  611 1053    0  743  273  299  606  839  116  335  440  127  578  332
POL  369  460  863  387 1110  738  597  914  862 1034 1029 1332  572    0  314  291  754 1108  186  410  508  208  773  505
NZL  396  216  319  205  308  294  264  296  378  271  541  456  204  193    0  204  318  331   47  336  183   57  284  135
ZAF  281  212  349  192  293  302  343  319  367  301  343  495  257  217  186    0  308  302   52  237  230   55  314  137
JPN  287  232  412  224  336  313  319  322  352  375  339  473  246  250  149  195    0  744  110  336  512  120  555  318
CZE  343  396  758  351 1080  616  605  798  733  918 1167 1182  711  766  216  225  230    0  148  404  491  188  707  427
EST   45   55   77   38  132  101   60   76   82  101  125  136   67  102   21   22   29   82    0   70   78   53  104  113
IRL  379  386  425  357  474  437  407  499  795  453  613  540  280  301  275  226  193  302   38    0  205   79  373  177
KOR  230  190  650  195  337  304  357  321  387  521  332  978  342  369  123  178  242  341   33  144    0   98  429  259
SVN   70   96  132   79  264  144  111  139  135  199  179  156   90  164   42   37   51  137   27   64   61    0  120  103
PRT  367  504  871  389  765  657  717  725  765  848  871 1128  551  714  218  299  261  578   65  322  359   95    0  370
LVA  109  138  294  122  526  241  200  218  257  381  298  583  227  339   70   82   92  265   60  102  152   60  288    0
     ----------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
     ----------------------------------------------------------------------------------------------------------------------
AUS    0  486  891  455  858  761  645  861  892  674  893 1077  470  574  494  306  563  540   91  423  329  102  493  247
BEL  421    0  658  523  887  668  612  840  731  678 1004  756  413  578  275  245  419  531   94  401  269  128  506  242
CAN  805  627    0  828 2042 1163 1326 1455 1602 1795 1359 3230  898 1148  372  375 1171 1100  160  452  700  181  877  499
CHE  406  522  729    0  970  579  571  680  708  722  820  897  371  537  245  218  385  483   81  357  272  109  436  239
DEU  574  829 1220  822    0 2061 1471 2305 1834 2329 2546 2820 1024 1719  447  371 1177 1638  238  587  565  286  962  702
DFS  500  587  851  523 1181    0  989 1573 1346 1290 1650 1665  731 1135  459  383  805 1067  175  546  450  191  777  424
ESP  493  604  851  474  849  720    0 1273 1119 1310 1134 1566  730  946  334  372  861  897  144  437  503  165  768  398
FRA  589  837  983  628 1200  862 1000    0 1547 1583 1980 2405  852 1494  510  389 1135 1242  165  569  536  187  837  441
GBR  746  735 1618  706 1215  930  925 1037    0 1534 1672 2128  791 1142  482  394  895 1036  163  743  513  184  840  451
ITA  557  679 1561  664 1500 1015  992 1012 1313    0 1556 2444  896 1348  328  340  989 1228  195  484  609  233  888  560
NLD  734 1110 1209  802 1831 1208  981 1262 1395 1316    0 2209  806 1349  610  382  910 1379  203  673  482  211  886  481
USA  892  655 3247  828 1540 1033 1039 1312 1944 1974 1767    0 1164 1597  542  466 1704 1575  210  583  858  203 1117  689
HUN  331  339  793  312  684  524  566  572  639  762  611 1053    0  743  273  299  606  839  116  335  435  128  578  332
POL  369  460  863  387 1110  738  621  914  862 1034 1030 1332  572    0  314  291  754 1108  186  410  505  209  775  505
NZL  396  216  319  205  308  294  271  296  378  271  543  456  204  193    0  204  318  331   47  336  183   57  284  135
ZAF  281  212  349  192  293  303  344  319  367  301  345  495  257  217  186    0  307  302   52  237  230   56  315  137
JPN  286  230  410  223  334  311  319  320  350  373  338  471  245  250  148  193    0  743  110  336  511  121  554  318
CZE  343  396  758  351 1080  616  624  798  733  918 1168 1182  711  766  216  225  229    0  148  404  489  189  708  427
EST   45   55   77   38  132  101   64   76   82  101  125  136   67  102   21   22   29   82    0   70   77   53  105  113
IRL  379  386  425  357  474  437  426  499  797  453  616  540  280  301  275  226  192  302   38    0  204   80  373  177
KOR  230  190  648  195  336  303  358  319  386  519  333  971  338  368  123  177  241  341   32  144    0   99  427  258
SVN   71   97  133   80  266  146  117  140  136  201  180  157   91  165   42   37   52  138   27   65   62    0  121  104
PRT  367  506  873  390  765  660  734  727  767  849  876 1132  553  714  218  299  259  579   65  322  359   95    0  371
LVA  109  138  294  122  526  241  213  218  257  381  299  583  227  339   70   82   92  265   60  102  152   60  289    0
     ----------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
     -----------------------------------------------------------------------------------------------------------------
AUS    0  489  891  455  858  761  632  861  892  674  893 1077  470  574  306  565  540   91  422  329  102  493  247
BEL  420    0  658  522  885  667  596  844  731  679 1027  765  413  578  244  425  531   94  398  266  128  504  242
CAN  805  623    0  828 2042 1163 1317 1455 1602 1795 1359 3230  898 1148  375 1174 1100  160  452  703  181  874  499
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    CHE 406  521  729    0  970  579  562  680  708  722  820  897  371  537  218  387  483   81  357  272  109  435  239
    DEU 574  828 1220  822    0 2061 1437 2305 1834 2329 2546 2820 1024 1719  371 1180 1638  238  587  567  286  961  702
    DFS 500  587  851  523 1181    0  962 1573 1346 1290 1650 1665  731 1135  383  807 1067  175  546  451  191  776  424
    ESP 482  575  840  462  800  689    0 1241 1094 1292 1100 1541  719  922  367  855  877  140  421  500  161  750  391
    FRA 589  836  983  628 1200  862  945    0 1547 1583 1980 2405  852 1494  389 1138 1242  165  569  538  187  835  441
    GBR 746  731 1618  706 1215  930  889 1037    0 1534 1672 2128  791 1142  394  898 1036  163  740  515  184  840  451
    ITA 557  679 1561  664 1500 1015  964 1012 1313    0 1556 2444  896 1348  340  992 1228  195  484  612  233  887  560
    NLD 734 1122 1209  802 1831 1208  938 1262 1395 1316    0 2209  806 1349  382  913 1379  203  673  485  211  884  481
    USA 892  652 3247  828 1540 1033 1020 1312 1944 1974 1767    0 1164 1597  466 1707 1575  210  583  864  203 1114  689
    HUN 331  338  793  312  684  524  554  572  639  762  611 1053    0  743  299  607  839  116  335  439  128  577  332
    POL 369  460  863  387 1110  738  593  914  862 1034 1030 1332  572    0  291  755 1108  186  410  507  209  774  505
    ZAF 281  212  349  192  293  303  340  319  367  301  345  495  257  217    0  308  302   52  237  230   56  315  137
    JPN 291  235  415  227  338  315  321  327  357  377  345  478  246  251  196    0  744  110  336  513  121  555  318
    CZE 343  396  758  351 1080  616  601  798  733  918 1168 1182  711  766  225  231    0  148  404  491  189  708  427
    EST  45   55   77   38  132  101   60   76   82  101  125  136   67  102   22   29   82    0   70   78   53  105  113
    IRL 379  385  425  357  474  437  404  499  794  453  616  540  280  301  226  193  302   38    0  205   80  373  177
    KOR 230  190  650  195  337  304  356  321  387  521  335  978  342  369  178  244  341   33  144    0   99  429  259
    SVN  71   97  133   80  266  146  112  140  136  201  180  157   91  165   37   52  138   27   65   62    0  121  104
    PRT 367  503  871  389  765  660  714  725  765  847  873 1127  550  713  299  263  578   65  322  359   95    0  370
    LVA 109  138  294  122  526  241  197  218  257  381  299  583  227  339   82   92  265   60  102  152   60  288    0
    ------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
    ------------------------------------------------------------------------
    AUS    0  486  891  455  858  761  635  861  892  674  893 1077  470  574  494  306  565  540   90  423  329   99  493  225
    BEL  421    0  658  523  887  668  598  840  731  678 1004  756  413  578  275  245  422  531   94  401  269  125  505  223
    CAN  805  627    0  828 2042 1163 1318 1455 1602 1796 1359 3230  898 1148  372  375 1174 1100  160  452  704  177  874  473
    CHE  406  522  729    0  970  579  564  680  708  722  820  897  371  537  245  218  387  483   81  357  272  106  435  220
    DEU  574  829 1220  822    0 2061 1445 2305 1834 2330 2546 2820 1024 1719  447  371 1180 1638  237  587  568  282  961  674
    DFS  500  587  851  523 1181    0  966 1573 1346 1290 1650 1665  731 1135  459  383  807 1067  174  546  452  187  776  398
    ESP  484  581  841  465  808  693    0 1247 1097 1294 1104 1546  719  925  325  369  855  879  139  422  501  159  751  371
    FRA  589  837  983  628 1200  862  953    0 1547 1583 1980 2405  852 1494  510  389 1138 1242  164  569  539  183  835  416
    GBR  746  735 1618  706 1215  930  893 1037    0 1534 1672 2128  791 1142  482  394  898 1036  163  743  515  180  840  423
    ITA  557  679 1561  664 1500 1015  968 1012 1313    0 1556 2444  896 1348  328  340  992 1228  195  484  613  230  887  545
    NLD  734 1110 1209  802 1831 1208  943 1262 1395 1316    0 2209  806 1349  610  382  913 1379  202  673  487  207  884  448
    USA  892  655 3247  828 1540 1032 1023 1312 1944 1974 1767    0 1164 1597  542  466 1707 1575  210  583  866  199 1114  658
    HUN  331  339  793  312  684  524  555  572  639  762  611 1053    0  743  273  299  607  839  116  335  440  127  577  315
    POL  369  460  863  387 1110  738  596  914  862 1034 1030 1332  572    0  314  291  755 1108  185  410  508  207  774  484
    NZL  396  216  319  205  308  294  296  378  271  543  456  204  193    0  204  319  331   47  336  183   56  284  117
    ZAF  281  212  349  192  293  303  342  319  367  301  345  495  257  217  186    0  308  302   52  237  230   55  315  124
    JPN  290  235  415  227  338  315  321  326  356  377  344  477  246  251  150  196    0  744  110  336  513  119  555  300
    CZE  343  396  758  351 1080  616  604  798  733  918 1168 1182  711  766  216  225  230    0  148  404  491  187  708  412
    EST   45   55   77   38  132  101   60   76   82  101  125  136   67  102   21   22   29   82    0   70   78   53  105  107
    IRL  379  386  425  357  474  437  406  499  797  453  616  540  280  301  275  193  302   38    0  205   78  373  163
    KOR  230  190  650  195  337  304  356  321  387  521  335  978  342  369  123  178  244  341   33  144    0   98  429  249
    SVN   69   96  131   80  263  144  111  138  134  199  179  155   91  165   41   36   51  138   27   64   62    0  120  102
    PRT  367  504  871  389  765  660  716  725  765  847  873 1127  550  713  218  299  263  578   65  322  359   94    0  353
    LVA   99  127  280  112  504  227  186  207  239  371  278  562  214  327   60   74   88  257   55   92  150   59  276    0
    ------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA  NZL
    ------------------------------------------------------------------------
    AUS    0  493  891  455  858  761  632  861  892  674  893 1077  458  574  306  557  540   91  422  330   99  493  247   47
    BEL  422    0  662  524  891  672  599  851  737  680 1035  771  409  581  247  428  533   94  403  270  125  505  242   35
    CAN  805  627    0  828 2042 1163 1318 1455 1602 1796 1359 3230  884 1148  375 1167 1100  160  452  706  177  874  499   56
    CHE  406  523  729    0  970  579  563  680  708  722  820  897  367  537  218  387  483   81  357  273  106  435  239   41
    DEU  574  829 1220  822    0 2061 1439 2305 1834 2330 2546 2820 1015 1719  371 1178 1638  238  587  569  282  961  702   63
    DFS  500  588  851  523 1181    0  963 1573 1346 1290 1650 1665  717 1135  383  801 1067  175  546  453  187  776  424   44
    ESP  482  578  841  463  802  690    0 1242 1094 1293 1101 1543  710  923  367  845  878  140  421  502  159  750  391   46
    FRA  589  838  983  628 1200  862  946    0 1547 1583 1980 2405  834 1494  389 1125 1242  165  569  541  183  835  441   43
    GBR  746  735 1618  706 1215  930  890 1037    0 1534 1672 2128  777 1142  394  893 1036  163  740  516  180  840  451   54
    ITA  557  679 1561  664 1500 1015  966 1012 1313    0 1556 2444  895 1348  340  991 1228  195  484  615  230  887  560   53
    NLD  734 1133 1209  802 1831 1208  940 1262 1395 1316    0 2209  789 1349  382  907 1379  203  673  489  207  884  481   72
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   USA  892  656 3247  828 1540 1033 1021 1312 1944 1974 1767    0 1135 1597  466 1687 1575  210  583  868  199 1114  689   56
   HUN  319  330  779  308  677  515  540  561  623  759  598 1027    0  738  291  598  827  116  329  439  127  575  332   34
   POL  369  460  863  387 1110  738  594  914  862 1034 1030 1332  568    0  291  753 1108  186  410  508  207  774  505   42
   ZAF  281  212  349  192  293  303  340  319  367  301  345  495  246  217    0  305  302   52  237  231   55  315  137   18
   JPN  290  235  415  227  338  315  321  326  356  377  344  477  240  251  196    0  743  109  334  514  119  555  318   41
   CZE  343  396  758  351 1080  616  602  798  733  918 1168 1182  700  766  225  230    0  148  404  491  187  708  427   42
   EST   45   55   77   38  132  101   60   76   82  101  125  136   67  102   22   29   82    0   70   78   53  105  113   14
   IRL  379  386  425  357  474  437  405  499  794  453  616  540  272  301  226  193  302   38    0  206   78  373  177   35
   KOR  230  190  651  195  337  304  356  321  387  522  336  982  340  369  178  244  341   33  144    0   98  429  259   35
   SVN   69   96  131   80  263  144  111  138  134  199  179  155   91  165   36   51  138   27   64   62    0  120  102   21
   PRT  367  504  871  389  765  660  715  725  765  847  873 1127  547  713  299  263  578   65  322  359   94    0  370   28
   LVA  109  138  294  122  526  241  198  218  257  381  299  583  227  339   82   92  265   60  102  152   59  288    0   23
   NZL   51   33   59   36   59   40   43   43   52   51   70   58   22   28   18   37   33    3   31   30   12   26   11    0
         --------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  POL  NZL  JPN  CZE  EST  IRL  KOR  SVN  PRT  ZAF  HUN  LVA
         --------------------------------------------------------------------------------------
   AUS    0  479  890  438  853  636  637  859  756  673  739  797  471  487  368  423   90  356  210   99  408  165  315  247
   BEL  420    0  650  497  875  612  599  823  650  676  890  652  493  270  319  447   94  341  188  125  433  144  301  242
   CAN  804  622    0  791 2034 1006 1320 1454 1423 1794 1208 2817 1044  367  871  970  159  387  526  177  757  226  728  499
   CHE  402  498  699    0  881  535  559  661  662  703  700  809  462  240  322  402   80  314  199  105  370  133  288  234
   DEU  573  827 1219  766    0 1911 1448 2276 1672 2327 2396 2494 1582  437  939 1430  237  514  431  282  847  222  796  702
   DFS  464  549  820  481 1134    0  863 1336 1101 1252 1430 1269  978  370  565  852  168  432  306  187  654  211  526  411
   ESP  485  585  844  464  814  646    0 1254  988 1298 1008 1376  829  326  673  774  139  354  372  160  657  218  560  394
   FRA  589  831  983  613 1184  804  965    0 1257 1581 1570 1704 1326  501  794 1054  163  453  386  183  706  214  641  440
   GBR  660  669 1462  650 1155  826  785  905    0 1492 1373 1754  996  374  641  854  151  549  365  179  697  220  577  434
   ITA  557  679 1561  651 1499  990  972 1012 1287    0 1519 2342 1287  326  882 1157  194  453  481  230  810  241  780  560
   NLD  643  967 1094  691 1765 1110  866 1114 1163 1295    0 1599 1189  486  657 1191  196  536  342  207  735  211  592  464
   USA  722  616 2976  749 1458  932  918 1021 1723 1953 1321    0 1403  369 1146 1316  200  457  625  199  908  257  865  667
   POL  314  396  805  323 1014  659  506  812  768  984  922 1211    0  236  628  972  173  326  409  205  673  188  600  479
   NZL  393  214  317  202  307  263  266  295  310  271  445  328  149    0  203  241   46  271  113   56  217  100  153  134
   JPN  249  205  373  206  308  282  277  288  306  353  300  417  227  125    0  574   97  231  356  116  417  164  433  278
   CZE  291  340  682  286  962  532  508  655  614  869 1050 1014  690  166  208    0  140  310  363  185  598  202  639  405
   EST   45   55   77   38  132   98   60   76   79  101  121  133   93   21   29   77    0   63   69   53   97   44  104  113
   IRL  333  347  384  320  442  376  355  420  567  432  520  465  249  232  169  245   38    0  124   78  301  125  225  169
   KOR  157  146  496  151  267  226  253  251  267  413  243  717  312   82  186  254   30   93    0   97  305  127  315  211
   SVN   69   96  131   80  263  144  112  138  134  199  179  155  165   41   51  137   27   64   62    0  120   53  124  102
   PRT  308  427  728  324  676  548  597  606  621  774  716  920  626  166  219  488   60  263  262   94    0  204  428  347
   ZAF  158  132  211  111  182  187  192  189  196  209  184  262  160   92  124  154   20  119   88   35  194    0  170  104
   HUN  238  245  656  239  531  396  403  430  461  651  450  801  478  113  194  542   60  195  241   90  417  151    0  297
   LVA  109  138  294  120  526  240  202  217  253  381  293  572  324   70   88  255   60  102  127   59  270   64  200    0
         --------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  JPN  CZE  EST  IRL  KOR  SVN  PRT
         --------------------------------------------------------------------------------------
   AUS    0  493  891  455  857  761  632  738  892  674  893 1074  470  573  494  564  540   90  423  330  101  493
   BEL  422    0  660  522  889  670  601  789  735  678 1033  766  416  580  279  427  533   94  402  270  126  504
   CAN  805  627    0  828 2041 1163 1310 1299 1602 1795 1359 3211  898 1147  372 1173 1100  160  452  708  179  875
   CHE  406  523  729    0  969  579  566  657  708  722  820  892  371  536  245  386  483   81  357  273  106  435
   DEU  574  828 1220  822    0 2060 1448 2179 1833 2328 2545 2810 1023 1714  446 1178 1637  237  586  568  282  961
   DFS  500  588  851  523 1181    0  966 1409 1346 1290 1650 1662  731 1132  459  806 1067  174  545  454  187  776
   ESP  486  587  844  467  816  699    0 1173 1100 1299 1112 1543  724  931  330  851  885  139  428  505  161  759
   FRA  559  796  938  613 1137  837  937    0 1410 1553 1689 1985  812 1409  429  989 1189  160  526  509  183  797
   GBR  746  735 1618  706 1215  930  902 1004    0 1534 1672 2122  791 1141  482  897 1036  163  742  516  181  838
   ITA  557  679 1561  664 1500 1015  972 1003 1313    0 1556 2439  896 1348  328  991 1228  195  484  616  230  888
   NLD  734 1133 1209  802 1831 1208  953 1156 1395 1316    0 2202  806 1347  610  912 1379  202  673  489  206  885
   USA  888  654 3218  822 1532 1028 1024 1132 1936 1966 1759    0 1161 1592  541 1702 1569  209  580  870  200 1112
   HUN  331  339  793  312  684  524  558  564  639  762  611 1051    0  742  273  606  839  116  335  440  127  578
   POL  369  460  863  387 1110  738  601  870  862 1034 1030 1328  572    0  314  753 1108  185  410  508   57  775
   NZL  396  216  319  205  308  294  267  277  378  271  543  454  204  193    0  318  331   47  336  185   57  284
   JPN  289  233  413  226  337  314  320  323  355  376  343  476  246  251  149    0  744  110  336  514  120  555
   CZE  343  396  758  351 1080  616  610  771  733  918 1168 1176  711  766  216  231    0  148  404  491  185  707
   EST   45   55   77   38  132  101   60   75   82  101  125  136   67  102   21   29   82    0   70   78   53  105
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 IRL  379  386  425  357  474  437  413  484  797  453  616  539  280  301  275  193  302   38    0  206   79  373
 KOR  230  190  651  195  337  304  359  314  387  522  336  981  342  369  123  243  341   33  144    0   98  429
 SVN   70   95  132   79  262  142  112  136  135  197  176  156   90  164   42   51  136   27   64   61    0  120
 PRT  367  504  871  389  765  660  723  711  765  848  874 1120  551  714  218  261  578   65  322  359   95    0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal

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       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  JPN  CZE  EST  IRL  SVN  PRT
     ----------------------------------------------------------------------------------------------------------
 AUS    0  493  891  455  858  761  638  861  892  674  893 1077  470  574  494  564  540   90  410   99  493
 BEL  422    0  662  524  891  672  605  851  737  680 1035  771  416  581  279  428  533   94  391  124  505
 CAN  805  627    0  828 2042 1163 1321 1455 1602 1795 1359 3230  898 1148  372 1173 1100  160  438  177  875
 CHE  406  523  729    0  970  579  567  680  708  722  820  897  371  537  245  386  483   81  350  106  435
 DEU  574  829 1220  822    0 2061 1452 2305 1834 2329 2546 2820 1024 1719  447 1179 1638  237  571  281  962
 DFS  500  588  851  523 1181    0  973 1573 1346 1290 1650 1665  731 1135  459  806 1067  174  522  186  777
 ESP  486  587  844  467  816  699    0 1256 1106 1299 1115 1554  724  933  331  857  886  139  415  160  759
 FRA  589  838  983  628 1200  862  965    0 1547 1583 1980 2405  852 1494  510 1137 1242  164  540  182  836
 GBR  746  733 1617  706 1213  929  899 1035    0 1534 1672 2128  791 1142  482  897 1036  163  705  180  840
 ITA  557  679 1561  664 1500 1015  972 1012 1311    0 1556 2444  896 1348  328  991 1228  195  478  229  888
 NLD  734 1133 1209  802 1831 1208  953 1262 1393 1316    0 2209  806 1349  610  912 1379  202  637  205  885
 USA  892  656 3247  828 1540 1033 1030 1312 1944 1974 1767    0 1164 1597  542 1706 1575  210  557  199 1115
 HUN  331  339  793  312  684  524  558  572  639  762  611 1053    0  743  273  606  839  116  324  127  578
 POL  369  460  863  387 1110  738  601  914  862 1034 1030 1332  572    0  314  754 1108  185  399  207  775
 NZL  396  216  319  205  308  294  268  296  378  271  543  456  204  193    0  318  331   47  322   56  284
 JPN  288  232  412  225  336  313  319  324  354  375  342  475  246  250  149    0  744  110  322  119  555
 CZE  343  396  758  351 1080  616  610  798  732  918 1168 1182  711  766  216  231    0  148  389  186  708
 EST   45   55   77   38  132  101   60   76   82  101  125  136   67  102   21   29   82    0   69   53  105
 IRL  377  385  424  355  472  436  410  492  773  451  608  534  278  301  271  193  301   38    0   78  362
 SVN   69   95  131   80  262  143  112  137  134  198  177  155   91  165   41   51  137   27   64    0  120
 PRT  367  505  871  389  765  660  724  725  765  848  875 1128  552  714  218  261  578   65  322   94    0
     ----------------------------------------------------------------------------------------------------------
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal

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       AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  JPN  CZE  EST  IRL  SVN  PRT
     -----------------------------------------------------------------------------------------------------
 AUS    0  485  891  455  857  761  640  734  892  674  873 1075  458  572  555  540   90  409  101  500
 BEL  421    0  655  519  883  665  603  783  728  676  987  749  405  575  414  530   94  388  126  510
 CAN  805  626    0  828 2041 1163 1323 1294 1602 1795 1328 3222  884 1147 1157 1100  160  438  179  888
 CHE  406  520  729    0  969  579  569  652  708  722  811  895  367  536  384  483   81  350  106  443
 DEU  574  828 1220  822    0 2060 1455 2173 1833 2328 2520 2819 1014 1713 1173 1637  237  570  282  973
 DFS  500  586  851  523 1181    0  977 1405 1346 1290 1622 1651  717 1132  795 1067  174  522  187  789
 ESP  487  594  846  470  822  704    0 1171 1108 1302 1101 1552  716  935  846  888  141  416  162  772
 FRA  552  792  928  604 1130  835  935    0 1405 1551 1663 1975  803 1407  977 1188  160  513  183  806
 GBR  746  732 1617  706 1213  929  905  991    0 1534 1647 2121  777 1141  885 1036  163  702  181  850
 ITA  557  679 1561  664 1500 1015  977 1001 1311    0 1547 2442  895 1348  988 1228  195  478  230  894
 NLD  709 1075 1162  780 1804 1185  931 1122 1355 1305    0 2099  782 1336  874 1368  201  631  206  885
 USA  888  651 3247  828 1539 1033 1031 1116 1943 1974 1557    0 1135 1595 1653 1573  210  555  200 1128
 HUN  319  330  779  308  677  515  546  551  623  759  582 1027    0  737  596  827  116  319  127  583
 POL  369  459  863  387 1110  738  604  869  862 1034 1022 1332  568    0  751 1108  185  399  207  784
 JPN  286  231  411  223  335  312  319  317  351  374  337  472  239  250    0  741  109  318  120  561
 CZE  343  395  758  351 1080  616  613  767  732  918 1151 1181  700  766  229    0  148  389  185  713
 EST   45   55   77   38  132  101   62   75   82  101  124  136   67  102   29   82    0   69   53  106
 IRL  377  385  424  355  472  436  412  478  770  451  598  534  271  301  192  301   38    0   79  366
 SVN   70   95  132   79  262  142  113  136  135  197  176  156   90  164   51  136   27   64    0  120
 PRT  371  512  881  395  775  667  737  720  778  855  869 1139  556  719  260  583   65  324   95    0
     -----------------------------------------------------------------------------------------------------
```

HOL
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common bulls below diagonal
common three quarter sib group above diagonal

```
       BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  CZE  IRL  KOR  SVN  PRT  EST  HUN  POL
     -------------------------------------------------------------------------------------------------
 BEL    0  610  431  718  618  542  738  672  573  832  691  434  363  175  101  421   65  299  345
 CAN  606    0  716 1714 1067 1209 1262 1507 1607 1140 3034  951  422  466  151  743  114  727  720
 CHE  432  623    0  766  488  476  572  606  615  626  752  378  289  181   87  346   58  280  315
```

```
    DEU   688 1104  643    0 1606 1228 1765 1474 1832 2014 2259 1293  455  376  213  740  167  759 1020
    DFS   570  848  435 1033    0  883 1400 1334 1026 1389 1644  860  519  276  149  648  124  531  671
    ESP   541  779  375  678  655    0 1106 1004 1113  958 1423  761  378  333  132  639  101  556  598
    FRA   765  924  511  978  834  881    0 1402 1242 1444 1973 1020  512  344  144  686  111  639  920
    GBR   696 1544  577 1023  927  800  992    0 1290 1380 2112  863  697  325  152  702  116  584  698
    ITA   595 1437  565 1250  870  845  898 1142    0 1235 2034  993  392  419  184  704  143  722  846
    NLD   905 1061  603 1543 1104  805 1039 1163 1124    0 1621 1156  550  307  165  707  142  584  795
    USA   631 3133  670 1315 1032  895 1116 1941 1766 1292    0 1335  554  546  171  926  137  878  962
    CZE   337  671  268  892  523  506  638  606  770 1022 1004    0  313  313  156  578   98  635  691
    IRL   371  421  281  382  436  371  478  764  385  528  534  239    0  113   65  298   46  227  237
    KOR   138  453  140  247  209  234  232  244  368  226  634  221   87    0   81  267   47  279  297
    SVN    80  113   66  200  119   98  111  119  163  146  136  118   54   54    0  104   40  105  155
    PRT   418  724  302  623  543  581  596  612  681  689  919  470  259  232   81    0   65  423  469
    EST    37   57   25   87   73   41   51   64   72   85   76   53   26   19   17   39    0   79  116
    HUN   243  650  231  515  396  398  427  456  619  445  795  534  193  212   76  412   43    0  461
    POL   266  547  216  629  447  361  531  531  646  579  747  450  190  207  128  425   55  366    0
   ------------------------------------------------------------------------------------------------------
HOL
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  common bulls below diagonal
  common three quarter sib group above diagonal
         BEL  CHE  DEU  DFS  FRA  GBR  ITA  NLD  USA  CZE  JPN  IRL  KOR  CAN  PRT  ESP  SVN  EST  HUN  NZL  POL
   ------------------------------------------------------------------------------------------------------
    BEL    0  482  703  302  590  671  590  885  685  397  259  334  183  505  307  551  125   76  256  205  421
    CHE  487    0  847  247  558  679  677  765  866  384  274  310  199  695  279  536  107   70  254  196  411
    DEU  673  714    0  802 1575 1483 1975 2076 2273 1229  749  407  417 1567  599 1237  280  199  675  271 1334
    DFS  241  201  368    0  494  625  532  788  686  437  220  276  133  322  264  417   82   61  225  194  420
    FRA  595  502  951  259    0  991 1243 1193 1372  843  603  336  357  983  487  942  182  131  548  217 1075
    GBR  693  668 1039  352  753    0 1379 1530 2077  796  532  633  365 1204  508 1037  182  137  516  344  885
    ITA  605  615 1283  365  877 1194    0 1348 2193 1022  721  390  473 1555  585 1185  224  165  680  238 1116
    NLD  964  748 1589  503  921 1286 1183    0 1833 1116  524  540  338  997  519 1010  208  168  512  432 1037
    USA  615  798 1329  343  851 1931 1833 1437    0 1240  950  509  623 2404  688 1477  201  165  791  342 1273
    CZE  308  273  867  231  563  565  785  987  950    0  475  261  355  820  442  705  184  120  552  190  853
    JPN  168  175  269  107  249  263  311  259  364  184    0  168  335  684  299  575  111   78  370  138  525
    IRL  343  315  355  206  328  697  378  517  496  199  127    0  112  314  184  362   73   50  178  229  250
    KOR  139  151  266   78  250  267  406  241  717  250  185   85    0  493  279  367   97   63  300  109  396
    CAN  525  632 1100  247  780 1289 1420 1011 2707  625  326  335  480    0  531 1021  177  126  627  214  889
    PRT  303  240  507  193  447  441  558  489  711  359  176  162  236  531    0  471  116   78  336  143  528
    ESP  557  438  676  275  758  851  883  867  974  460  241  366  251  719  415    0  161  117  501  232  721
    SVN   94   79  264   55  137  135  196  177  156  136   50   58   61  132   89  112    0   51  122   56  199
    EST   46   32  110   26   65   73   88  107  101   68   27   30   29   70   53   53   27    0   92   34  154
    HUN  207  204  465  148  382  410  571  390  724  467  168  149  231  601  336  359   88   54    0  123  535
    NZL  173  173  228  127  183  287  216  398  296  140  102  193   83  219  121  200   41   17   95    0  160
    POL  341  295  910  255  707  703  878  824 1137  615  205  203  305  772  506  449  161   87  441  122    0
   ------------------------------------------------------------------------------------------------------
JER
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  common bulls below diagonal
  common three quarter sib group above diagonal
         AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
   ------------------------------------------------------------------------------------------------------
    AUS    0  150   87  104   35  150  253  132   17   15
    CAN  155    0   92  136   37   75  440  143   13   22
    DFS   64   80    0  104   47   91  152  125   21   34
    GBR  103  141  100    0   43   75  168  112   16   34
    ITA   35   35   46   41    0   33   47   47   10   16
    NZL  150   75   70   77   30    0  148  102   16   18
    USA  246  440  120  174   50  154    0  251   33   35
    ZAF  136  143  108  110   48   99  258    0   26   25
    NLD   13    8   15   13    7   13   34   21    0    4
    CHE   13   20   33   32   17   16   35   25    3    0
   ------------------------------------------------------------------------------------------------------
JER
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
         AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
   ------------------------------------------------------------------------------------------------------
    AUS    0  150   87  104   35  150  253  125   17   22
```

```
   CAN  155    0   92  136   37   75  440  132   13   27
   DFS   64   80    0  104   47   91  152  116   21   44
   GBR  103  141  100    0   43   75  168  107   16   41
   ITA   35   35   46   41    0   33   47   47   10   23
   NZL  150   75   70   77   30    0  148   93   16   24
   USA  246  440  120  174   50  154    0  231   33   42
   ZAF  130  134  102  106   48   91  240    0   26   37
   NLD   13    8   15   13    7   13   34   21    0    8
   CHE   20   26   43   40   24   22   43   37    6    0
  -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  ZAF  NLD  USA  CHE
  -------------------------------------------------------------------------
   AUS    0  150   87  104   35  150  125   17  253   26
   CAN  155    0   92  136   37   75  132   13  440   31
   DFS   64   80    0  104   47   91  116   21  152   47
   GBR  103  141  100    0   43   75  107   16  168   44
   ITA   35   35   46   41    0   33   47   10   47   26
   NZL  150   75   70   77   30    0   93   16  148   28
   ZAF  130  134  102  106   48   91    0   26  231   41
   NLD   13    8   15   13    7   13   21    0   33   10
   USA  246  440  120  174   50  154  240   34    0   46
   CHE   23   28   46   43   26   26   40    7   47    0
  -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  USA  ZAF  NLD  CHE
  -------------------------------------------------------------------------
   AUS    0  150   84  103   35  253  131    5   26
   CAN  155    0   92  136   37  440  143    5   31
   DFS   61   79    0  102   47  152  124   10   47
   GBR  102  141   98    0   43  168  112   10   44
   ITA   35   35   46   41    0   47   47    5   26
   USA  246  440  119  174   50    0  250   16   46
   ZAF  135  143  107  110   48  257    0   11   41
   NLD    2    3    9    8    4   15    9    0    5
   CHE   23   28   46   43   26   47   40    5    0
  -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
  -------------------------------------------------------------------------
   AUS    0  150   87  104   35  150  253  132   17   26
   CAN  155    0   92  136   37   75  440  143   13   31
   DFS   64   80    0  104   47   91  152  125   21   47
   GBR  103  141  100    0   43   75  168  112   16   44
   ITA   35   35   46   41    0   33   47   47   10   26
   NZL  150   75   70   77   30    0  148  102   16   28
   USA  246  440  120  174   50  154    0  251   33   46
   ZAF  136  143  108  110   48   99  258    0   26   41
   NLD   13    8   15   13    7   13   34   21    0   10
   CHE   23   28   46   43   26   26   47   40    7    0
  -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
  -------------------------------------------------------------------------
   AUS    0  150   82  104   35  150  253  132   17   26
   CAN  155    0   82  136   37   75  440  143   13   31
   DFS   56   67    0  100   44   84  142  118   19   46
```

```
    GBR  103  141   93    0   43   75  168  112   16   44
    ITA   35   35   41   41    0   33   47   47   10   26
    NZL  150   75   62   77   30    0  148  102   16   28
    USA  246  440  108  174   50  154    0  251   33   46
    ZAF  136  143   98  110   48   99  258    0   26   41
    NLD   13    8   13   13    7   13   34   21    0   10
    CHE   23   28   45   43   26   26   47   40    7    0
    ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
    ------------------------------------------------------------------------------
    AUS    0  150   87  104   35  150  253  132   17   26
    CAN  155    0   92  136   37   75  440  143   13   31
    DFS   64   80    0  104   47   91  152  125   21   47
    GBR  103  141  100    0   43   75  168  112   16   44
    ITA   35   35   46   41    0   33   47   47   10   26
    NZL  150   75   70   77   30    0  148  102   16   28
    USA  246  440  120  174   50  154    0  251   33   46
    ZAF  136  143  108  110   48   99  258    0   26   41
    NLD   13    8   15   13    7   13   34   21    0   10
    CHE   23   28   46   43   26   26   47   40    7    0
    ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         AUS  CAN  DFS  ITA  ZAF  NLD  USA  CHE
    ------------------------------------------------------------------------------
    AUS    0  150   79   35  103   17  253   26
    CAN  155    0   82   37  118   13  440   31
    DFS   54   67    0   44   88   19  142   46
    ITA   35   35   41    0   44   10   47   26
    ZAF  105  114   74   44    0   23  196   41
    NLD   13    8   13    7   16    0   33   10
    USA  246  440  108   50  194   34    0   46
    CHE   23   28   45   26   40    7   47    0
    ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         AUS  CAN  DFS  GBR  ITA  USA  ZAF  NLD  CHE
    ------------------------------------------------------------------------------
    AUS    0  150   84  103   35  253  131   17   26
    CAN  155    0   92  136   37  440  143   13   31
    DFS   62   80    0  102   47  152  124   21   47
    GBR  102  141   98    0   43  168  112   16   44
    ITA   35   35   46   41    0   47   47   10   26
    USA  246  440  120  174   50    0  250   33   46
    ZAF  135  143  107  110   48  257    0   26   41
    NLD   13    8   15   13    7   34   21    0   10
    CHE   23   28   46   43   26   47   40    7    0
    ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
    ------------------------------------------------------------------------------
    AUS    0  150   87  104   35  150  253  132   17   26
    CAN  155    0   92  136   37   75  440  143   13   31
    DFS   64   80    0  104   47   91  152  125   21   47
    GBR  103  141  100    0   43   75  168  112   16   44
    ITA   35   35   46   41    0   33   47   47   10   26
    NZL  150   75   70   77   30    0  148  102   16   28
    USA  246  440  120  174   50  154    0  251   33   46
```

```
  ZAF  136  143  108  110   48   99  258    0   26   41
  NLD   13    8   15   13    7   13   34   21    0   10
  CHE   23   28   46   43   26   26   47   40    7    0
      -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
      -------------------------------------------------------------------------
  AUS    0  150   79  104   35  150  253  132   17   26
  CAN  155    0   76  136   37   75  440  143   13   31
  DFS   54   65    0   91   44   77  135  113   19   46
  GBR  103  141   89    0   43   75  168  112   16   44
  ITA   35   35   41   41    0   33   47   47   10   26
  NZL  150   75   57   77   30    0  148  102   16   28
  USA  246  440  103  174   50  154    0  251   33   46
  ZAF  136  143   96  110   48   99  258    0   26   41
  NLD   13    8   13   13    7   13   34   21    0   10
  CHE   23   28   45   43   26   26   47   40    7    0
      -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
      -------------------------------------------------------------------------
  AUS    0  150   87  104   35  150  253  132   17   26
  CAN  155    0   92  136   37   75  440  143   13   31
  DFS   64   80    0  104   47   91  152  125   21   47
  GBR  103  141  100    0   43   75  168  112   16   44
  ITA   35   35   46   41    0   33   47   47   10   26
  NZL  150   75   70   77   30    0  148  102   16   28
  USA  246  440  120  174   50  154    0  251   33   46
  ZAF  136  143  108  110   48   99  258    0   26   41
  NLD   13    8   15   13    7   13   34   21    0   10
  CHE   23   28   46   43   26   26   47   40    7    0
      -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  USA  ZAF  NLD  CHE
      -------------------------------------------------------------------------
  AUS    0  150   85  103   35  253  132   17   26
  CAN  155    0   92  136   37  437  143   13   31
  DFS   63   80    0  102   47  152  125   21   47
  GBR  102  140   98    0   43  168  112   16   44
  ITA   35   35   46   41    0   47   47   10   26
  USA  246  438  120  174   50    0  250   33   46
  ZAF  136  143  108  110   48  257    0   26   41
  NLD   13    8   15   13    7   34   21    0   10
  CHE   23   28   46   43   26   47   40    7    0
      -------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
      -------------------------------------------------------------------------
  AUS    0  150   87  104   35  150  253  132   17   26
  CAN  155    0   92  136   37   75  440  143   13   31
  DFS   64   80    0  104   46   91  152  125   21   47
  GBR  103  141  100    0   43   75  168  112   16   44
  ITA   35   35   45   41    0   33   46   47   10   26
  NZL  150   75   70   77   30    0  148  102   16   28
  USA  246  440  120  174   49  154    0  251   33   46
  ZAF  136  143  108  110   48   99  258    0   26   41
  NLD   13    8   15   13    7   13   34   21    0   10
```

```
   CHE    23    28    46    43    26    26    47    40     7     0
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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  USA  ZAF  NLD  CHE  NZL
 ------------------------------------------------------------------------------

   AUS     0   150    84   103    35   253   124    17    26    16
   CAN   155     0    92   136    37   440   132    13    31    10
   DFS    62    80     0   102    47   152   115    21    47    13
   GBR   102   141    98     0    43   168   107    16    44    10
   ITA    35    35    46    41     0    47    47    10    26     2
   USA   246   440   120   174    50     0   231    33    46    13
   ZAF   129   134   101   106    48   240     0    26    41    11
   NLD    13     8    15    13     7    34    21     0    10     1
   CHE    23    28    46    43    26    47    40     7     0     4
   NZL    14     9    12     9     1    12    11     0     4     0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  NZL  ZAF  NLD  USA  CHE
 ------------------------------------------------------------------------------

   AUS     0   150    71   150   122    17   253    26
   CAN   155     0    71    75   129    13   440    31
   DFS    49    62     0    70   100    19   128    46
   NZL   150    75    52     0    89    16   148    28
   ZAF   125   128    84    83     0    26   226    41
   NLD    13     8    13    13    21     0    33    10
   USA   246   440    98   154   227    34     0    46
   CHE    23    28    45    26    40     7    47     0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  NLD  CHE
 ------------------------------------------------------------------------------

   AUS     0   150    87    35    35   150   253    17    22
   CAN   155     0    92    37    37    75   440    13    27
   DFS    64    80     0    32    47    91   152    21    44
   GBR    40    43    30     0    12    35    37     4     3
   ITA    35    35    46    13     0    33    47    10    23
   NZL   150    75    70    39    30     0   148    16    24
   USA   246   440   120    40    50   154     0    33    42
   NLD    13     8    15     5     7    13    34     0     8
   CHE    20    26    43     4    24    22    43     6     0
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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  NZL  USA  NLD  CHE
 ------------------------------------------------------------------------------

   AUS     0   150    84   104   150   253    17    22
   CAN   155     0    86   136    75   437    13    27
   DFS    62    78     0    94    83   145    21    44
   GBR   103   140    95     0    72   168    16    41
   NZL   150    75    64    74     0   148    16    24
   USA   246   438   115   174   154     0    33    42
   NLD    13     8    15    13    13    34     0     8
   CHE    20    26    43    40    22    43     6     0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
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```
          AUS   CAN   DFS   GBR   ITA   USA   NLD   CHE
       ----------------------------------------------------------------------

    AUS    0   124    74    83    40   212    15    19
    CAN  129     0    92   136    48   440    13    27
    DFS   53    80     0   102    57   152    21    44
    GBR   81   140    98     0    51   168    16    41
    ITA   38    46    56    51     0    64    14    24
    USA  201   440   120   174    68     0    33    42
    NLD   11     8    15    13    11    34     0     8
    CHE   17    26    43    40    25    43     6     0
       ----------------------------------------------------------------------

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RDC
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  common bulls below diagonal
  common three quarter sib group above diagonal
         AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD   CAM   LVA
       ----------------------------------------------------------------------

    AUS    0    23    10    45     9    14    21    13     8     3    15
    CAN   23     0    10   142    68     4    32   149     3     0    10
    DEU   10    10     0    50     4    11     8     4    12     0    29
    DFS   34   143    41     0    52    83    54    82    33     0   120
    GBR    8    67     4    48     0     0    25    55     1     0     3
    NOR   10     4    10    62     0     0     6     0    22     0    11
    NZL   20    30     8    52    22     5     0    21     2     2     6
    USA   13   142     4    77    51     0    20     0     2     0     4
    NLD    8     3    11    32     1    21     2     2     0     0    12
    CAM    3     0     0     0     0     0     2     0     0     0     0
    LVA   14    10    23    82     3     9     6     4    11     0     0
       ----------------------------------------------------------------------

RDC
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  common bulls below diagonal
  common three quarter sib group above diagonal
         AUS   CAN   DEU   DFS   GBR   NZL   USA   NLD   CAM   NOR   LVA
       ----------------------------------------------------------------------

    AUS    0    23    10    45     9    21    13     8     3     8    14
    CAN   23     0    10   142    68    32   149     3     0     1    10
    DEU   10    10     0    50     4     8     4    12     0     5    27
    DFS   34   143    41     0    52    52    82    31     0    49   101
    GBR    8    67     4    48     0    25    55     1     0     0     3
    NZL   20    30     8    50    22     0    21     2     2     3     5
    USA   13   142     4    77    51    20     0     2     0     0     4
    NLD    8     3    11    30     1     2     2     0     0    12    11
    CAM    3     0     0     0     0     2     0     0     0     0     0
    NOR    7     1     4    35     0     3     0    11     0     0     1
    LVA   13    10    21    67     3     5     4    10     0     0     0
       ----------------------------------------------------------------------

RDC
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  common bulls below diagonal
  common three quarter sib group above diagonal
         AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD   CAM   LVA
       ----------------------------------------------------------------------

    AUS    0    23    10    45     9     7    21    13     8     3    15
    CAN   23     0    10   142    68     1    32   147     3     0    10
    DEU   10    10     0    50     4     6     8     4    12     0    29
    DFS   34   143    41     0    52    59    52    82    31     0   120
    GBR    8    67     4    48     0     0    25    54     1     0     3
    NOR    6     1     5    42     0     0     3     0    17     0     2
    NZL   20    30     8    50    22     3     0    21     2     2     6
    USA   13   141     4    77    50     0    20     0     2     0     4
    NLD    8     3    11    30     1    16     2     2     0     0    12
    CAM    3     0     0     0     0     0     2     0     0     0     0
    LVA   14    10    23    82     3     1     6     4    11     0     0
       ----------------------------------------------------------------------
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  CAN  DEU  DFS  GBR  USA  NLD  CAM  NOR  LVA
   ---------------------------------------------------------------------
   AUS   0   23   10   45    9   13    8    3    8   15
   CAN  23    0   10  142   68  149    3    0    3   10
   DEU  10   10    0   50    4    4   12    0    5   29
   DFS  34  143   41    0   52   82   30    0   56  120
   GBR   8   67    4   48    0   55    1    0    0    3
   USA  13  142    4   77   51    0    2    0    0    4
   NLD   8    3   11   29    1    2    0    0   12   11
   CAM   3    0    0    0    0    0    0    0    0    0
   NOR   7    2    4   43    0    0   11    0    0    1
   LVA  14   10   23   82    3    4   10    0    0    0
   ---------------------------------------------------------------------

RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
   ---------------------------------------------------------------------
   AUS   0   23   10   45    9   16   21   13    8    3   15
   CAN  23    0   10  142   68    4   32  149    3    0   10
   DEU  10   10    0   50    4   11    8    4   12    0   29
   DFS  34  143   41    0   52   93   51   82   32    0  120
   GBR   8   67    4   48    0    0   25   55    1    0    3
   NOR  12    4   10   70    0    0    7    0   22    0   12
   NZL  20   30    8   47   22    6    0   21    2    2    6
   USA  13  142    4   77   51    0   20    0    2    0    4
   NLD   8    3   11   31    1   21    2    2    0    0   12
   CAM   3    0    0    0    0    0    2    0    0    0    0
   LVA  14   10   23   82    3   10    6    4   11    0    0
   ---------------------------------------------------------------------

RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  CAN  DEU  DFS  GBR  NZL  USA  NLD  CAM  NOR  LVA
   ---------------------------------------------------------------------
   AUS   0   23   10   45    9   21   13    8    3    7   15
   CAN  23    0   10  142   68   32  149    3    0    1   10
   DEU  10   10    0   50    4    8    4   12    0    5   29
   DFS  34  143   41    0   52   52   82   32    0   47  120
   GBR   8   67    4   48    0   25   55    1    0    0    3
   NZL  20   30    8   50   22    0   21    2    2    3    6
   USA  13  142    4   77   51   20    0    2    0    0    4
   NLD   8    3   11   31    1    2    2    0    0   12   12
   CAM   3    0    0    0    0    2    0    0    0    0    0
   NOR   6    1    4   33    0    3    0   11    0    0    1
   LVA  14   10   23   82    3    6    4   11    0    0    0
   ---------------------------------------------------------------------

RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
   ---------------------------------------------------------------------
   AUS   0   23   10   45    9   16   21   13    8    3   15
   CAN  23    0   10  142   68    4   32  149    3    0   10
   DEU  10   10    0   50    4   11    8    4   12    0   29
   DFS  34  143   41    0   52   96   54   82   33    0  120
   GBR   8   67    4   48    0    0   25   55    1    0    3
   NOR  12    4   10   72    0    0    7    0   22    0   12
   NZL  20   30    8   52   22    6    0   21    2    2    6
   USA  13  142    4   77   51    0   20    0    2    0    4
   NLD   8    3   11   32    1   21    2    2    0    0   12
   CAM   3    0    0    0    0    0    2    0    0    0    0
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   LVA   14   10   23   82    3   10    6    4   11    0    0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  NOR  NLD  USA  CAM  LVA
--------------------------------------------------------------------------------

   AUS    0   23   10   45   16    8   13    3   14
   CAN   23    0   10  141    4    3  149    0   10
   DEU   10   10    0   50   11   12    4    0   27
   DFS   34  142   41    0   93   30   82    0  101
   NOR   12    4   10   70    0   22    0    0   10
   NLD    8    3   11   29   21    0    2    0   11
   USA   13  142    4   77    0    2    0    0    4
   CAM    3    0    0    0    0    0    0    0    0
   LVA   13   10   21   67    8   10    4    0    0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------

   AUS    0   23    7   45    9   16   13    8    3   15
   CAN   23    0    8  142   68    4  149    3    0   10
   DEU    7    8    0   41    4   10    4   12    0   16
   DFS   34  143   35    0   52   93   82   31    0  120
   GBR    8   67    4   48    0    0   55    1    0    3
   NOR   12    4    9   70    0    0    0   22    0   12
   USA   13  142    4   77   51    0    0    2    0    4
   NLD    8    3   11   30    1   21    2    0    0   12
   CAM    3    0    0    0    0    0    0    0    0    0
   LVA   14   10   13   82    3   10    4   11    0    0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------

   AUS    0   23   10   45    9   16   21   13    8    3   15
   CAN   23    0   10  142   68    4   32  149    3    0   10
   DEU   10   10    0   50    4   11    8    4   12    0   29
   DFS   34  143   41    0   52   96   54   82   31    0  120
   GBR    8   67    4   48    0    0   25   55    1    0    3
   NOR   12    4   10   72    0    0    7    0   22    0   12
   NZL   20   30    8   52   22    6    0   21    2    2    6
   USA   13  142    4   77   51    0   20    0    2    0    4
   NLD    8    3   11   30    1   21    2    2    0    0   12
   CAM    3    0    0    0    0    0    2    0    0    0    0
   LVA   14   10   23   82    3   10    6    4   11    0    0
--------------------------------------------------------------------------------
RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------

   AUS    0   23   10   45    9   16   21   13    8    3   15
   CAN   23    0   10  142   68    4   32  149    3    0   10
   DEU   10   10    0   50    4   11    8    4   12    0   29
   DFS   34  143   41    0   52   93   52   82   31    0  114
   GBR    8   67    4   48    0    0   25   55    1    0    3
   NOR   12    4   10   70    0    0    7    0   22    0   12
   NZL   20   30    8   49   22    6    0   21    2    2    6
   USA   13  142    4   77   51    0   20    0    2    0    4
   NLD    8    3   11   30    1   21    2    2    0    0   12
   CAM    3    0    0    0    0    0    2    0    0    0    0
```

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   LVA    14    10    23    78     3    10     6     4    11     0     0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD   CAM   LVA
-------------------------------------------------------------------------------
   AUS     0    23    10    45     9    16    21    13     8     3    15
   CAN    23     0    10   142    68     4    32   149     3     0    10
   DEU    10    10     0    50     4    12     8     4    12     0    29
   DFS    34   143    41     0    52    88    54    82    33     0   120
   GBR     8    67     4    48     0     0    25    55     1     0     3
   NOR    12     4    11    67     0     0     7     0    22     0    12
   NZL    20    30     8    52    22     6     0    21     2     2     6
   USA    13   142     4    77    51     0    20     0     2     0     4
   NLD     8     3    11    32     1    21     2     2     0     0    12
   CAM     3     0     0     0     0     0     2     0     0     0     0
   LVA    14    10    23    82     3    10     6     4    11     0     0
-------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD   CAM   LVA
-------------------------------------------------------------------------------
   AUS     0    23    10    45     9    16    13     8     3    15
   CAN    23     0    10   142    68     4   146     3     0    10
   DEU    10    10     0    50     4    11     4    12     0    29
   DFS    34   143    41     0    52    96    82    33     0   120
   GBR     8    67     4    48     0     0    55     1     0     3
   NOR    12     4    10    72     0     0     0    22     0    12
   USA    13   141     4    77    51     0     0     2     0     4
   NLD     8     3    11    32     1    21     2     0     0    12
   CAM     3     0     0     0     0     0     0     0     0     0
   LVA    14    10    23    82     3    10     4    11     0     0
-------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD   CAM   LVA
-------------------------------------------------------------------------------
   AUS     0    23    10    45     9    16    21    13     8     3    14
   CAN    23     0    10   142    68     4    32   149     3     0    10
   DEU    10    10     0    50     4    12     8     4    12     0    27
   DFS    34   143    41     0    52    95    52    82    32     0   101
   GBR     8    67     4    48     0     0    25    55     1     0     3
   NOR    12     4    11    72     0     0     7     0    22     0    11
   NZL    20    30     8    50    22     6     0    21     2     2     5
   USA    13   142     4    77    51     0    20     0     2     0     4
   NLD     8     3    11    31     1    21     2     2     0     0    11
   CAM     3     0     0     0     0     0     2     0     0     0     0
   LVA    13    10    21    67     3     9     5     4    10     0     0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD   CAM   LVA   NZL
-------------------------------------------------------------------------------
   AUS     0    23    10    45     9    16    13     8     3    15     2
   CAN    23     0    10   142    68     4   147     3     0    10     1
   DEU    10    10     0    50     4    11     4    12     0    29     1
   DFS    34   143    41     0    52    90    82    33     0   120     4
   GBR     8    67     4    48     0     0    54     1     0     3     2
   NOR    12     4    10    67     0     0     0    22     0    12     1
   USA    13   141     4    77    50     0     0     2     0     4     1
   NLD     8     3    11    32     1    21     2     0     0    12     0
```

```
 CAM    3    0    0    0    0    0    0    0    0    0    0
 LVA   14   10   23   82    3   10    4   11    0    0    0
 NZL    2    1    1    4    2    1    1    0    0    0    0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  NOR  NZL  NLD  USA  CAM  LVA
 -----------------------------------------------------------------------------
 AUS    0   23   10   40   16   21    8   13    3   15
 CAN   23    0   10  136    4   32    3  149    0   10
 DEU   10   10    0   47   12    8   12    4    0   29
 DFS   31  136   41    0   87   47   30   77    0  103
 NOR   12    4   11   67    0    7   22    0    0   12
 NZL   20   30    8   46    6    0    1   21    2    6
 NLD    8    3   11   29   21    1    0    2    0   11
 USA   13  142    4   73    0   20    2    0    0    4
 CAM    3    0    0    0    0    2    0    0    0    0
 LVA   14   10   23   70   10    6   10    4    0    0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM
 -----------------------------------------------------------------------------
 AUS    0   23   10   45    8   18   21   13    8    3
 CAN   23    0   10  142   65    6   32  149    3    0
 DEU   10   10    0   50    4   13    8    4   12    0
 DFS   34  143   41    0   52  111   54   82   33    0
 GBR    7   64    4   48    0    0   22   53    1    0
 NOR   14    5   12   88    0    0    8    0   23    0
 NZL   20   30    8   52   19    7    0   21    2    2
 USA   13  142    4   77   49    0   20    0    2    0
 NLD    8    3   11   32    1   22    2    2    0    0
 CAM    3    0    0    0    0    0    2    0    0    0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM
 -----------------------------------------------------------------------------
 AUS    0   23   10   45    8   16   21   13    8    3
 CAN   23    0   10  142   65    4   32  146    3    0
 DEU   10   10    0   50    4   11    8    4   12    0
 DFS   34  143   41    0   52   96   54   82   33    0
 GBR    7   64    4   48    0    0   22   53    1    0
 NOR   12    4   10   72    0    0    7    0   22    0
 NZL   20   30    8   52   19    6    0   21    2    2
 USA   13  141    4   77   49    0   20    0    2    0
 NLD    8    3   11   32    1   21    2    2    0    0
 CAM    3    0    0    0    0    0    2    0    0    0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  USA  NLD  CAM
 -----------------------------------------------------------------------------
 AUS    0   23   10   45    8   16   13    8    3
 CAN   23    0   10  142   65    4  149    3    0
 DEU   10   10    0   50    4   11    4   12    0
 DFS   34  143   41    0   52   96   82   33    0
 GBR    7   64    4   48    0    0   53    1    0
 NOR   12    4   10   72    0    0    0   22    0
 USA   13  142    4   77   49    0    0    2    0
 NLD    8    3   11   32    1   21    2    0    0
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   CAM      3      0      0      0      0      0      0      0      0
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