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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 (22) 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 the United States of America
were computed.
Brown Swiss, Guernsey, Holstein, Jersey  and Red Dairy Cattle breed
data were included in this evaluation.

Changes in national procedures
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Changes in the national genetic evaluation of conformation traits are as
follows:

AUS Decrease in information due to pedigree corrections

ITA (HOL) Decrease in information due to flow data and pedigree corrections

EST (HOL) Pedigree corrections

CAN Decrease in information due to changes in pedigrees

ESP Base change

NLD (JER) Change in trait definition for angularity

HRV (HOL SIM) Pedigree corrections

NZL (RDC JER HOL) Parentage verifications

LTU Base change

JPN (HOL) Pedigree corrections

CHE (BSW) Base change
CHE (HOL) New standarization

ZAF (RDC JER) Base change

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN
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1)     Data submission for pedigree, EBV/PTA, and parameters is
        possible only through uploading of the data to the Interbull
        Data Exchange Area (IDEA);
2)     Interbull Centre has moved to a completely new MACE evaluation
        software called "Dairy System for International Evaluation
        (DAISIE)", partly because of the extended use of IDEA for EBV/PTA,
        and partly because of our continuous efforts to make the system
        more effective than before;
3)     All trait groups (including conformation traits) are now evaluated
        in-house.
4)     The file containing heritability values now contain more decimal
        places for heritability, and one extra field for the definition of
        reference base population;
5)     The file containing genetic correlations has changed name from
        rG_columns_all to cor{RUNID}.csv, and also contains one extra field
        for the number of common bulls;
6)     The file containing sire genetic standard deviations has changed name
        from sire_std_columns_all to std{RUNID}.csv;
7)     Sire-MGS based pedigree files are not distributed anymore;
8)     Parent averages in the "ipa" format are not distributed anymore;
9)     An import AI bull (type of proof = 21) with official publication
        status 'Y' from a given country is included in the distribution
        file if the bull has a first country proof included from a different
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country OR a second country proof is included with minimum required
                number of daughters or EDC (20, 10, 150, 20, 20, and 80) and herds
                (20, 10, 150, 20, 20, and 80) for different breeds (BSW, GUE, HOL,
                JER, RDC and SIM), respectively;
10)   Bulls with some missing pedigree information (sires and/or dam and/or
                birthdate) are excluded from evaluations;
11)   Standardization factors are not used anymore;
12)   Post-processing of genetic correlation are now applied to all trait groups.

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
in the 01x-proof file.

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

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
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Dates for the next test run can be found on
http://www.interbull.org/ib/servicecalendar.
PUBLICATION OF INTERBULL TEST RUN
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Test evaluation results are meant for review purposes only and should not be
published.
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^LTable 1. National evaluation data considered in the Interbull
evaluation for conformation traits (August Routine Evaluation 2015).
Number of records for stature by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
ARG						
AUS		51	3301	647	245	
BEL			1009			
CAN	177	91	9798	560	748	
CHE	2413		2568			
CZE			3433			
DEA	3049					
DEU			19193		234	
DFS			10762	1750	5617	
ESP			2914			
EST			507			
FRA	294		15341			
FRM						
FRR			206			
GBR	15	184	4874	372	260	
HUN			2189			
IRL			1337			
ISR						
ITA	1714		8540	93		
JPN			4706			
KOR			882			
LTU						
LVA						
NLD	103		13163	35	36	
NOR					1791	
NZL			5045	3307	527	
POL			7009			
PRT			1963			
SVK						
SVN	239		317			
URY						
USA	736	636	29050	3309	215	
ZAF			769	471		
HRV						
No.Records	8740	962	148876	10544	9673	
Pub. Proofs	7050	822	124273	9274	10637	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      6.77
CHE      0.93   12.32
FRA      0.97    0.94    0.91
ITA      0.96    0.95    0.94   13.66
NLD      0.94    0.92    0.96    0.92    4.50
USA      0.98    0.94    0.96    0.96    0.94    1.45
DEA      0.95    0.97    0.96    0.96    0.94    0.95   11.37
SVN      0.87    0.88    0.89    0.90    0.89    0.86    0.91   16.65
GBR      0.95    0.89    0.94    0.93    0.92    0.94    0.87    0.85    0.82


--------------------------------------------------------------------------------------
BSW    cwi
--------------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.80
CHE      0.89   10.23
FRA      0.84    0.80    0.90
ITA      0.81    0.85    0.86   16.13
NLD      0.88    0.76    0.69    0.66    4.40
USA      0.94    0.91    0.85    0.89    0.82    0.80
DEA      0.85    0.83    0.69    0.76    0.74    0.83   12.03
SVN      0.84    0.78    0.77    0.81    0.74    0.82    0.90   22.26
GBR      0.91    0.85    0.83    0.74    0.90    0.82    0.82    0.79    1.38


--------------------------------------------------------------------------------------
BSW    bde
--------------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     DEA     SVN     GBR
CAN      6.80
CHE      0.82    9.58
FRA      0.78    0.85    0.89
ITA      0.80    0.90    0.91   14.82
NLD      0.85    0.81    0.82    0.80    3.97
DEA      0.91    0.89    0.93    0.92    0.81   11.53
SVN      0.77    0.82    0.78    0.85    0.74    0.82   26.06
GBR      0.86    0.86    0.83    0.86    0.89    0.81    0.80    1.38


--------------------------------------------------------------------------------------
BSW    ang
--------------------------------------------------------------------------------------
         CAN     CHE     FRA     NLD     USA     GBR
CAN      8.25
CHE      0.47   11.00
FRA      0.88    0.42    0.90
NLD      0.69    0.53    0.68    3.48
USA      0.81    0.69    0.73    0.57    1.01
GBR      0.85    0.77    0.77    0.76    0.87    0.83


--------------------------------------------------------------------------------------
BSW    ran
--------------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.39
CHE      0.92   10.66
FRA      0.97    0.95    0.94
ITA      0.94    0.93    0.93   15.82
NLD      0.95    0.89    0.94    0.92    4.48
USA      0.97    0.94    0.97    0.91    0.93    1.09
DEA      0.95    0.95    0.95    0.96    0.90    0.96   12.10
SVN      0.88    0.88    0.90    0.92    0.86    0.88    0.92   21.84
GBR      0.94    0.91    0.95    0.91    0.95    0.94    0.87    0.84    2.08
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--------------------------------------------------------------------------------
BSW    rwi
--------------------------------------------------------------------------------
         CAN     CHE     FRA     NLD     USA     DEA     GBR     SVN
CAN      7.12
CHE      0.87    9.73
FRA      0.80    0.73    0.96
NLD      0.93    0.85    0.74    4.06
USA      0.87    0.82    0.85    0.76    0.68
DEA      0.88    0.87    0.77    0.79    0.86   12.57
GBR      0.89    0.80    0.88    0.85    0.90    0.71    1.21
SVN      0.84    0.78    0.78    0.81    0.77    0.82    0.77   27.85


--------------------------------------------------------------------------------
BSW    rls
--------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.90
CHE      0.90   13.07
FRA      0.92    0.90    1.00
ITA      0.93    0.87    0.93   17.19
NLD      0.88    0.80    0.89    0.87    5.27
USA      0.92    0.91    0.92    0.87    0.85    0.74
DEA      0.89    0.92    0.92    0.92    0.77    0.91   12.13
SVN      0.82    0.81    0.84    0.83    0.80    0.84    0.86   22.37
GBR      0.85    0.88    0.90    0.83    0.86    0.84    0.84    0.78    1.15


--------------------------------------------------------------------------------
BSW    fan
--------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.10
CHE      0.48   13.83
FRA      0.74    0.70    1.04
ITA      0.57    0.85    0.79   16.56
NLD      0.59    0.59    0.80    0.71    5.82
USA      0.71    0.68    0.85    0.82    0.83    0.68
DEA      0.36    0.90    0.67    0.89    0.56    0.60   11.40
SVN      0.52    0.82    0.70    0.84    0.61    0.66    0.93   26.00
GBR      0.78    0.68    0.88    0.80    0.84    0.84    0.68    0.72    1.07


--------------------------------------------------------------------------------
BSW    hde
--------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     DEA     SVN
CAN      8.37
CHE      0.88   12.96
FRA      0.89    0.80    1.13
ITA      0.82    0.82    0.87   16.21
NLD      0.83    0.69    0.88    0.77    5.82
DEA      0.84    0.86    0.85    0.89    0.76   12.25
SVN      0.68    0.68    0.80    0.87    0.73    0.86   31.38


--------------------------------------------------------------------------------
BSW    fua
--------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      7.21
CHE      0.42   11.70
FRA      0.66    0.61    0.98
ITA      0.40    0.89    0.69   12.49
NLD      0.91    0.51    0.76    0.50    4.84
USA      0.89    0.35    0.72    0.50    0.85    1.16
DEA      0.75    0.32    0.82    0.46    0.78    0.81   11.76
SVN      0.54    0.46    0.70    0.54    0.68    0.55    0.81   23.68
GBR      0.85    0.72    0.80    0.77    0.85    0.86    0.71    0.55    1.37


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```
BSW    ruh
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN      7.17
CHE      0.91    11.43
FRA      0.87     0.84     0.94
ITA      0.73     0.85     0.84    11.86
NLD      0.78     0.82     0.84     0.88     4.44
USA      0.88     0.82     0.86     0.87     0.88     1.03
DEA      0.80     0.86     0.89     0.92     0.90     0.85    12.51
SVN      0.75     0.76     0.73     0.81     0.83     0.75     0.84    19.64
GBR      0.78     0.80     0.83     0.85     0.87     0.89     0.74     0.66     1.27


--------------------------------------------------------------------------------
BSW    ruw
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN
CAN      7.93
CHE      0.92    11.63
FRA      0.88     0.87     0.88
ITA      0.82     0.87     0.76    12.52
NLD      0.68     0.58     0.72     0.73     4.44
USA      0.90     0.87     0.82     0.89     0.79     0.92
DEA      0.84     0.90     0.73     0.95     0.54     0.86    12.33
SVN      0.74     0.71     0.70     0.79     0.73     0.75     0.77    18.12


--------------------------------------------------------------------------------
BSW    usu
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN      8.07
CHE      0.89    11.86
FRA      0.83     0.90     0.92
ITA      0.93     0.87     0.88    14.33
NLD      0.84     0.82     0.88     0.85     4.70
USA      0.85     0.86     0.81     0.82     0.88     1.00
DEA      0.90     0.90     0.85     0.90     0.79     0.73    11.73
SVN      0.77     0.75     0.63     0.75     0.64     0.63     0.75    26.02
GBR      0.85     0.81     0.87     0.86     0.91     0.92     0.75     0.60     2.56


--------------------------------------------------------------------------------
BSW    ude
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN      6.50
CHE      0.94    11.84
FRA      0.94     0.95     1.00
ITA      0.93     0.97     0.95    15.73
NLD      0.95     0.95     0.94     0.94     4.26
USA      0.91     0.93     0.93     0.95     0.92     1.13
DEA      0.91     0.98     0.92     0.97     0.94     0.90    12.03
SVN      0.87     0.91     0.88     0.93     0.90     0.86     0.92    21.97
GBR      0.95     0.92     0.94     0.92     0.95     0.93     0.86     0.83     2.00


--------------------------------------------------------------------------------
BSW    ftp
--------------------------------------------------------------------------------
          CAN      CHE      FRA      NLD      USA      DEA      SVN      GBR
CAN      6.94
CHE      0.97    14.25
FRA      0.96     0.94     0.93
NLD      0.96     0.94     0.94     4.88
USA      0.92     0.90     0.89     0.90     1.09
DEA      0.96     0.98     0.94     0.94     0.90    11.44
SVN      0.88     0.86     0.91     0.84     0.82     0.86    18.77
GBR      0.94     0.90     0.88     0.92     0.92     0.86     0.84     1.27


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```
BSW     ftl
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN       5.96
CHE       0.80    14.70
FRA       0.86     0.94     0.97
ITA       0.85     0.94     0.96    14.89
NLD       0.83     0.93     0.91     0.91     4.87
USA       0.83     0.96     0.96     0.97     0.95     1.36
DEA       0.76     0.98     0.97     0.96     0.90     0.96    11.52
SVN       0.79     0.87     0.84     0.89     0.90     0.86     0.85    19.20
GBR       0.90     0.90     0.91     0.92     0.95     0.94     0.86     0.83     1.31


--------------------------------------------------------------------------------
BSW     rtp
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      DEA      SVN
CAN       7.17
CHE       0.97    14.66
FRA       0.98     0.97     0.95
ITA       0.90     0.87     0.89    14.84
NLD       0.97     0.95     0.96     0.89     4.63
DEA       0.94     0.98     0.95     0.85     0.93    11.39
SVN       0.88     0.88     0.87     0.79     0.87     0.90    18.30


--------------------------------------------------------------------------------
BSW     ocs
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN       7.62
CHE       0.85     8.67
FRA       0.86     0.90     1.01
ITA       0.79     0.82     0.87    10.02
NLD       0.78     0.65     0.79     0.70     3.96
USA       0.87     0.71     0.84     0.84     0.83     0.55
DEA       0.70     0.88     0.89     0.87     0.67     0.68    10.95
SVN       0.67     0.67     0.75     0.75     0.73     0.72     0.83    24.75
GBR       0.84     0.84     0.88     0.85     0.87     0.89     0.75     0.67     1.68


--------------------------------------------------------------------------------
BSW     ous
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN       7.91
CHE       0.89    12.86
FRA       0.90     0.94     1.06
ITA       0.84     0.92     0.87    11.78
NLD       0.88     0.89     0.90     0.86     4.73
USA       0.82     0.87     0.88     0.91     0.87     0.86
DEA       0.85     0.93     0.94     0.93     0.89     0.87    11.87
SVN       0.65     0.73     0.69     0.75     0.70     0.66     0.83    23.17
GBR       0.81     0.80     0.74     0.82     0.83     0.86     0.68     0.58     1.37


--------------------------------------------------------------------------------
BSW     ofl
--------------------------------------------------------------------------------
          CAN      CHE      FRA      ITA      NLD      USA      DEA      SVN      GBR
CAN       7.22
CHE       0.84    11.19
FRA       0.52     0.64     1.34
ITA       0.63     0.72     0.81    15.32
NLD       0.47     0.48     0.61     0.50     4.37
USA       0.46     0.50     0.82     0.72     0.55     0.95
DEA       0.69     0.83     0.69     0.83     0.39     0.43    11.53
SVN       0.74     0.82     0.67     0.77     0.57     0.63     0.87    30.57
GBR       0.73     0.72     0.76     0.70     0.72     0.71     0.58     0.61     1.61


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```
GUE     sta
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      6.16
GBR      0.97     1.09
USA      0.98     0.95     2.34
AUS      0.85     0.88     0.87     4.43


-------------------------------------------------------------------------------
GUE     cwi
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      6.53
GBR      0.94     1.64
USA      0.91     0.90     1.25
AUS      0.78     0.80     0.59     6.54


-------------------------------------------------------------------------------
GUE     bde
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      6.13
GBR      0.92     1.35
USA      0.82     0.90     1.42
AUS      0.78     0.77     0.78     5.61


-------------------------------------------------------------------------------
GUE     ang
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      7.58
GBR      0.79     1.47
USA      0.73     0.91     1.64
AUS      0.31     0.74     0.67     7.06


-------------------------------------------------------------------------------
GUE     ran
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      6.43
GBR      0.97     1.65
USA      0.97     0.97     1.60
AUS      0.93     0.96     0.90     8.17


-------------------------------------------------------------------------------
GUE     rwi
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      6.78
GBR      0.94     1.41
USA      0.94     0.90     1.33
AUS      0.89     0.91     0.78     5.05


-------------------------------------------------------------------------------
GUE     rls
-------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN      7.35
GBR      0.70     1.77
USA      0.86     0.66     0.92
AUS      0.71     0.84     0.62     7.12


-------------------------------------------------------------------------------
GUE     rlr
-------------------------------------------------------------------------------
          CAN      USA      AUS
CAN      7.21
USA      0.84     0.99
AUS      0.52     0.71     6.62
```

```
--------------------------------------------------------------------------------
GUE     fan
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      8.47
GBR      0.50    1.64
USA      0.78    0.66    0.76
AUS      0.42    0.83    0.63    8.78


--------------------------------------------------------------------------------
GUE     fua
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      7.10
GBR      0.94    1.54
USA      0.90    0.89    1.57
AUS      0.84    0.84    0.67    6.45


--------------------------------------------------------------------------------
GUE     ruh
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      7.22
GBR      0.72    1.77
USA      0.78    0.88    1.39
AUS      0.79    0.55    0.63    5.76


--------------------------------------------------------------------------------
GUE     usu
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      6.96
GBR      0.66    1.55
USA      0.70    0.76    1.09
AUS      0.80    0.69    0.81    8.08


--------------------------------------------------------------------------------
GUE     ude
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      6.03
GBR      0.97    1.58
USA      0.92    0.89    1.68
AUS      0.78    0.83    0.56    4.61


--------------------------------------------------------------------------------
GUE     ftp
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      5.76
GBR      0.96    1.26
USA      0.91    0.86    1.27
AUS      0.77    0.76    0.81    6.55


--------------------------------------------------------------------------------
GUE     ftl
--------------------------------------------------------------------------------
         CAN     GBR     USA     AUS
CAN      4.70
GBR      0.67    1.79
USA      0.74    0.97    1.48
AUS      0.43    0.91    0.87    6.41


--------------------------------------------------------------------------------
GUE     rtp
--------------------------------------------------------------------------------
         CAN     AUS
CAN      5.61
AUS      0.63    6.72
```

```
----------------------------------------------------------------------------------------
GUE     ocs
----------------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN      7.97
GBR      0.88    1.54
USA      0.75    0.80    1.08
AUS      0.46    0.42    0.60    7.20


----------------------------------------------------------------------------------------
GUE     ous
----------------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN      7.92
GBR      0.90    1.43
USA      0.82    0.74    0.76
AUS      0.55    0.54    0.59    4.66


----------------------------------------------------------------------------------------
GUE     ofl
----------------------------------------------------------------------------------------
          CAN     GBR     USA     AUS
CAN      7.28
GBR      0.59    1.44
USA      0.78    0.47    1.16
AUS      0.60    0.59    0.53    8.78


----------------------------------------------------------------------------------------
HOL     sta
----------------------------------------------------------------------------------------
          AUS     BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD
USA      HUN     POL     NZL     ZAF     JPN     CZE     EST     FRR     IRL     KOR     SVN     PRT
AUS      4.58
BEL      0.85    1.11
CAN      0.88    0.95    5.75
CHE      0.89    0.89    0.94   10.38
DEU      0.89    0.93    0.97    0.95   12.73
DFS      0.86    0.95    0.97    0.94    0.98   10.76
ESP      0.87    0.92    0.97    0.95    0.98    0.97    0.95
FRA      0.89    0.96    0.98    0.95    0.96    0.97    0.98    1.08
GBR      0.92    0.93    0.97    0.94    0.95    0.94    0.95    0.97    1.14
ITA      0.86    0.88    0.96    0.91    0.95    0.93    0.96    0.95    0.95    1.13
NLD      0.86    0.94    0.96    0.95    0.98    0.98    0.96    0.97    0.93    0.92    4.47
USA      0.89    0.90    0.98    0.93    0.95    0.94    0.95    0.95    0.96    0.95    0.93
1.21
HUN      0.88    0.92    0.97    0.93    0.95    0.94    0.97    0.97    0.94    0.94    0.93
0.95    1.01
POL      0.83    0.87    0.92    0.88    0.93    0.92    0.94    0.93    0.89    0.93    0.92
0.91    0.93    7.41
NZL      0.88    0.84    0.83    0.84    0.81    0.80    0.81    0.87    0.90    0.83    0.79
0.85    0.85    0.71    0.43
ZAF      0.88    0.91    0.93    0.89    0.90    0.87    0.89    0.92    0.95    0.89    0.86
0.92    0.91    0.85    0.87    9.16
JPN      0.89    0.96    0.98    0.95    0.96    0.97    0.97    0.98    0.96    0.95    0.96
0.97    0.96    0.92    0.85    0.92    1.22
CZE      0.87    0.94    0.96    0.92    0.97    0.95    0.95    0.96    0.94    0.94    0.95
0.93    0.95    0.93    0.83    0.92    0.95   14.91
EST      0.80    0.89    0.91    0.86    0.93    0.93    0.90    0.92    0.87    0.90    0.95
0.89    0.88    0.89    0.72    0.79    0.91    0.90   12.41
FRR      0.80    0.86    0.89    0.88    0.94    0.91    0.91    0.89    0.86    0.88    0.94
0.86    0.85    0.89    0.70    0.79    0.87    0.89    0.88    0.11
IRL      0.90    0.91    0.94    0.92    0.92    0.90    0.92    0.94    0.98    0.92    0.91
0.94    0.93    0.87    0.92    0.94    0.93    0.93    0.83    0.83    0.79
KOR      0.82    0.85    0.83    0.77    0.80    0.78    0.79    0.83    0.83    0.77    0.79
0.80    0.83    0.73    0.79    0.82    0.84    0.81    0.74    0.72    0.80    4.91
SVN      0.86    0.89    0.92    0.88    0.94    0.95    0.95    0.93    0.90    0.90    0.94
0.89    0.92    0.93    0.75    0.82    0.92    0.91    0.88    0.88    0.86    0.78   15.28
PRT      0.86    0.89    0.92    0.89    0.93    0.92    0.91    0.92    0.93    0.91    0.90
0.91    0.92    0.88    0.82    0.86    0.92    0.93    0.87    0.83    0.91    0.82    0.86
0.56
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HOL    cwi
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         AUS     BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD
USA    HUN     POL     NZL     ZAF     JPN     CZE     EST     FRR     IRL     KOR     SVN     PRT
AUS      5.18
BEL      0.64    1.68
CAN      0.66    0.86    6.37
CHE      0.60    0.83    0.93   11.23
DEU      0.65    0.84    0.88    0.84   12.27
DFS      0.68    0.85    0.92    0.86    0.92   12.45
ESP      0.61    0.87    0.94    0.87    0.83    0.85    1.04
FRA      0.51    0.90    0.88    0.92    0.84    0.82    0.87    1.16
GBR      0.78    0.85    0.91    0.87    0.90    0.89    0.86    0.83    1.27
ITA      0.35    0.78    0.81    0.82    0.71    0.68    0.83    0.88    0.72    1.22
NLD      0.64    0.88    0.89    0.88    0.94    0.91    0.86    0.89    0.91    0.73    4.69
USA      0.48    0.82    0.89    0.88    0.81    0.80    0.87    0.91    0.81    0.92    0.82
1.28
HUN      0.46    0.83    0.84    0.83    0.83    0.82    0.83    0.88    0.74    0.81    0.81
0.87    1.07
POL      0.56    0.85    0.88    0.84    0.83    0.82    0.88    0.84    0.83    0.76    0.84
0.82    0.84   13.05
NZL      0.77    0.68    0.71    0.65    0.69    0.67    0.72    0.61    0.79    0.58    0.65
0.67    0.57    0.63    0.35
ZAF      0.67    0.89    0.90    0.89    0.88    0.86    0.88    0.88    0.94    0.81    0.89
0.87    0.81    0.87    0.74   10.93
JPN      0.32    0.81    0.79    0.83    0.68    0.68    0.80    0.90    0.64    0.91    0.73
0.89    0.79    0.71    0.50    0.74    1.26
CZE      0.65    0.88    0.91    0.86    0.90    0.89    0.91    0.82    0.88    0.77    0.88
0.84    0.84    0.87    0.68    0.88    0.76   13.84
EST      0.66    0.76    0.79    0.69    0.69    0.81    0.77    0.66    0.76    0.56    0.77
0.60    0.63    0.76    0.59    0.71    0.57    0.77   14.62
FRR      0.54    0.55    0.60    0.62    0.58    0.61    0.57    0.52    0.66    0.47    0.65
0.60    0.53    0.59    0.55    0.59    0.40    0.63    0.52    0.06
IRL      0.76    0.82    0.86    0.85    0.89    0.84    0.81    0.82    0.97    0.73    0.87
0.80    0.75    0.81    0.84    0.91    0.63    0.83    0.69    0.64    1.41
KOR      0.59    0.78    0.63    0.63    0.63    0.68    0.67    0.68    0.65    0.59    0.66
0.67    0.67    0.54    0.64    0.63    0.69    0.76    0.57    0.46    0.63    2.85
SVN      0.45    0.71    0.82    0.79    0.75    0.76    0.79    0.74    0.77    0.71    0.81
0.81    0.76    0.81    0.54    0.81    0.65    0.77    0.62    0.65    0.73    0.48   21.00
PRT      0.56    0.82    0.80    0.78    0.86    0.80    0.82    0.84    0.78    0.74    0.83
0.82    0.82    0.85    0.57    0.80    0.77    0.85    0.71    0.53    0.76    0.68    0.74
0.29
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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	FRR	IRL	KOR	PRT	SVN
AUS	5.35																							
BEL	0.70	1.39																						
CAN	0.86	0.80	5.97																					
CHE	0.70	0.89	0.84	11.09																				
DEU	0.80	0.88	0.90	0.89	11.62																			
DFS	0.85	0.83	0.92	0.84	0.93	11.57																		
ESP	0.76	0.90	0.90	0.91	0.91	0.87	0.99																	
FRA	0.51	0.91	0.66	0.88	0.79	0.70	0.85	1.08																
GBR	0.79	0.91	0.87	0.91	0.90	0.87	0.93	0.84	1.20															
ITA	0.58	0.86	0.74	0.85	0.86	0.74	0.89	0.89	0.89	1.18														
NLD	0.72	0.90	0.85	0.92	0.92	0.86	0.90	0.87	0.91	0.87	4.69													
USA	0.59	0.89	0.75	0.89	0.86	0.76	0.90	0.91	0.89	0.93	0.89	1.17												
HUN	0.67	0.90	0.76	0.86	0.87	0.83	0.90	0.85	0.87	0.86	0.84	0.91	1.08											
POL	0.77	0.75	0.87	0.78	0.89	0.89	0.85	0.65	0.82	0.74	0.79	0.76	0.82	12.96										
NZL	0.78	0.60	0.63	0.54	0.68	0.68	0.63	0.45	0.61	0.51	0.52	0.54	0.58	0.70	0.35									
ZAF	0.80	0.88	0.88	0.84	0.89	0.87	0.91	0.77	0.93	0.83	0.84	0.85	0.86	0.90	0.71	11.09								
JPN	0.54	0.92	0.70	0.88	0.83	0.74	0.87	0.95	0.84	0.90	0.89	0.93	0.85	0.66	0.48	0.78	1.25							
CZE	0.83	0.82	0.91	0.80	0.94	0.92	0.87	0.65	0.87	0.77	0.84	0.76	0.85	0.91	0.67	0.90	0.72	15.20						
EST	0.71	0.82	0.85	0.74	0.84	0.84	0.86	0.75	0.84	0.79	0.82	0.82	0.84	0.81	0.58	0.81	0.75	0.84	13.99					
FRR	0.62	0.81	0.74	0.83	0.86	0.74	0.81	0.79	0.78	0.84	0.86	0.76	0.72	0.70	0.48	0.72	0.78	0.75	0.70	0.11				
IRL	0.83	0.90	0.88	0.87	0.92	0.90	0.91	0.82	0.97	0.87	0.90	0.86	0.86	0.85	0.72	0.94	0.83	0.88	0.84	0.77	1.29			
KOR	0.67	0.77	0.69	0.75	0.76	0.81	0.73	0.71	0.73	0.65	0.75	0.69	0.76	0.68	0.55	0.74	0.76	0.76	0.64	0.58	0.73	3.63		
PRT	0.74	0.80	0.76	0.75	0.88	0.85	0.81	0.68	0.82	0.78	0.78	0.81	0.83	0.84	0.67	0.87	0.78	0.86	0.73	0.69	0.86	0.70	0.31	
SVN	0.68	0.86	0.78	0.86	0.87	0.80	0.87	0.81	0.83	0.79	0.87	0.82	0.85	0.77	0.53	0.79	0.81	0.80	0.72	0.74	0.81	0.71	0.72	21.81

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	PRT	SVN
AUS	6.30																						
BEL	0.57	1.10																					
CAN	0.66	0.78	6.39																				
CHE	0.54	0.79	0.88	11.72																			
DEU	0.59	0.76	0.86	0.79	12.58																		
DFS	0.64	0.86	0.88	0.81	0.87	10.76																	
ESP	0.68	0.79	0.91	0.80	0.78	0.86	0.82																
FRA	0.62	0.81	0.88	0.86	0.81	0.87	0.86	0.98															
GBR	0.79	0.78	0.91	0.80	0.82	0.88	0.85	0.81	1.24														
ITA	0.72	0.74	0.89	0.76	0.84	0.85	0.84	0.81	0.89	1.30													
NLD	0.67	0.61	0.72	0.66	0.45	0.63	0.76	0.66	0.76	0.66	4.53												
USA	0.70	0.77	0.94	0.81	0.85	0.89	0.88	0.85	0.91	0.89	0.66	1.38											
HUN	0.59	0.72	0.77	0.74	0.87	0.80	0.74	0.78	0.74	0.79	0.41	0.80	0.89										
POL	0.49	0.68	0.71	0.71	0.66	0.72	0.77	0.75	0.69	0.74	0.69	0.70	0.58	6.85									
ZAF	0.66	0.80	0.77	0.69	0.82	0.82	0.73	0.74	0.86	0.81	0.48	0.80	0.80	0.58	9.41								
JPN	0.65	0.80	0.89	0.76	0.80	0.90	0.87	0.86	0.85	0.89	0.73	0.86	0.73	0.75	0.77	1.46							
CZE	0.59	0.76	0.81	0.73	0.80	0.84	0.73	0.77	0.74	0.81	0.53	0.78	0.81	0.62	0.68	0.74	14.38						
EST	0.39	0.68	0.59	0.57	0.64	0.68	0.50	0.56	0.54	0.59	0.39	0.56	0.70	0.50	0.63	0.63	0.66	15.16					
FRR	0.45	0.62	0.57	0.46	0.73	0.61	0.54	0.63	0.56	0.61	0.32	0.59	0.62	0.37	0.59	0.62	0.52	0.56	0.08				
IRL	0.75	0.81	0.92	0.82	0.85	0.90	0.87	0.86	0.96	0.89	0.72	0.93	0.80	0.70	0.87	0.85	0.76	0.56	0.58	0.79			
KOR	0.66	0.80	0.79	0.76	0.73	0.75	0.76	0.74	0.79	0.77	0.57	0.75	0.69	0.57	0.84	0.80	0.61	0.62	0.59	0.79	2.44		
PRT	0.56	0.69	0.76	0.59	0.74	0.73	0.71	0.70	0.78	0.80	0.48	0.78	0.69	0.57	0.70	0.76	0.70	0.49	0.70	0.76	0.77	0.27	
SVN	0.54	0.67	0.67	0.75	0.55	0.59	0.70	0.68	0.64	0.61	0.76	0.65	0.47	0.81	0.46	0.62	0.50	0.51	0.40	0.64	0.58	0.47	24.42

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HOL     ran
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        AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA     HUN      POL      NZL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT
AUS      5.57
BEL      0.95     1.65
CAN      0.93     0.96     6.01
CHE      0.94     0.96     0.96    11.45
DEU      0.93     0.96     0.98     0.95    11.87
DFS      0.93     0.97     0.98     0.94     0.98    11.66
ESP      0.94     0.96     0.97     0.96     0.98     0.97     1.14
FRA      0.96     0.97     0.97     0.96     0.96     0.97     0.97     1.08
GBR      0.96     0.95     0.96     0.94     0.97     0.96     0.96     0.98     1.28
ITA      0.90     0.94     0.96     0.92     0.95     0.95     0.96     0.96     0.94     1.57
NLD      0.93     0.96     0.97     0.93     0.98     0.97     0.97     0.96     0.97     0.95     5.06
USA      0.93     0.94     0.97     0.94     0.96     0.96     0.96     0.96     0.97     0.95     0.96
1.46
HUN      0.94     0.96     0.96     0.95     0.97     0.97     0.98     0.97     0.95     0.95     0.96
0.95     1.02
POL      0.91     0.95     0.95     0.95     0.96     0.95     0.97     0.95     0.93     0.96     0.95
0.92     0.96    12.38
NZL      0.97     0.89     0.88     0.89     0.88     0.89     0.89     0.93     0.95     0.85     0.88
0.90     0.88     0.85     0.32
ZAF      0.98     0.96     0.95     0.94     0.95     0.94     0.96     0.96     0.96     0.93     0.95
0.94     0.97     0.93     0.94    11.43
JPN      0.89     0.94     0.98     0.95     0.96     0.97     0.97     0.95     0.92     0.95     0.95
0.94     0.96     0.96     0.83     0.91     1.50
CZE      0.88     0.94     0.96     0.91     0.97     0.96     0.95     0.93     0.94     0.95     0.95
0.96     0.95     0.93     0.84     0.92     0.94    13.11
EST      0.85     0.90     0.92     0.85     0.93     0.92     0.90     0.89     0.89     0.91     0.95
0.90     0.89     0.90     0.79     0.88     0.91     0.92    13.82
FRR      0.89     0.93     0.89     0.87     0.92     0.92     0.90     0.93     0.93     0.89     0.93
0.90     0.88     0.91     0.85     0.89     0.86     0.90     0.86     0.12
IRL      0.97     0.93     0.94     0.93     0.94     0.94     0.94     0.96     0.99     0.93     0.95
0.95     0.93     0.91     0.96     0.96     0.89     0.91     0.86     0.90     1.72
KOR      0.84     0.88     0.89     0.87     0.90     0.89     0.90     0.89     0.85     0.87     0.86
0.86     0.89     0.90     0.79     0.86     0.91     0.85     0.82     0.82     0.82     5.57
SVN      0.91     0.94     0.94     0.93     0.94     0.95     0.95     0.93     0.90     0.93     0.91
0.92     0.93     0.94     0.83     0.89     0.94     0.91     0.85     0.87     0.88     0.87    18.77
PRT      0.90     0.91     0.92     0.91     0.94     0.91     0.94     0.93     0.94     0.91     0.94
0.94     0.93     0.91     0.87     0.92     0.90     0.93     0.85     0.91     0.92     0.85     0.91
0.49

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HOL    rwi
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        AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA     HUN      POL      NZL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      PRT      SVN
AUS     5.15
BEL     0.88     1.41
CAN     0.90     0.95     5.91
CHE     0.88     0.95     0.93    11.02
DEU     0.86     0.92     0.95     0.90    11.32
DFS     0.83     0.92     0.95     0.89     0.96    12.40
ESP     0.91     0.93     0.98     0.92     0.96     0.94     1.04
FRA     0.89     0.96     0.96     0.93     0.95     0.94     0.95     1.11
GBR     0.86     0.90     0.94     0.87     0.90     0.91     0.92     0.94     1.18
ITA     0.80     0.83     0.88     0.81     0.83     0.85     0.88     0.89     0.92     1.26
NLD     0.89     0.95     0.95     0.92     0.95     0.94     0.96     0.95     0.89     0.83     4.64
USA     0.78     0.85     0.91     0.81     0.83     0.87     0.88     0.89     0.95     0.90     0.82
1.29
HUN     0.84     0.93     0.93     0.87     0.92     0.91     0.92     0.94     0.91     0.88     0.91
0.89    1.18
POL     0.85     0.92     0.91     0.90     0.89     0.90     0.91     0.91     0.89     0.85     0.89
0.83    0.90    11.31
NZL     0.88     0.82     0.85     0.78     0.82     0.79     0.84     0.82     0.85     0.75     0.82
0.80    0.80     0.69     0.29
ZAF     0.79     0.85     0.87     0.79     0.86     0.85     0.84     0.87     0.93     0.84     0.82
0.90    0.91     0.83     0.80    11.55
JPN     0.84     0.94     0.95     0.92     0.94     0.95     0.94     0.97     0.93     0.88     0.94
0.89    0.95     0.90     0.81     0.89     1.38
CZE     0.86     0.91     0.94     0.89     0.94     0.92     0.95     0.91     0.90     0.85     0.92
0.85    0.92     0.92     0.83     0.82     0.91    12.94
EST     0.80     0.86     0.86     0.82     0.87     0.86     0.86     0.87     0.78     0.76     0.90
0.74    0.84     0.87     0.68     0.73     0.85     0.82    13.16
FRR     0.85     0.88     0.90     0.85     0.91     0.90     0.92     0.92     0.89     0.83     0.92
0.83    0.83     0.87     0.79     0.80     0.87     0.89     0.82     0.15
IRL     0.69     0.77     0.82     0.73     0.82     0.83     0.80     0.82     0.91     0.79     0.75
0.91    0.84     0.74     0.81     0.87     0.82     0.82     0.64     0.75     1.59
KOR     0.73     0.87     0.79     0.81     0.84     0.81     0.79     0.87     0.78     0.68     0.79
0.74    0.84     0.75     0.77     0.77     0.88     0.80     0.70     0.76     0.74     3.66
PRT     0.76     0.85     0.87     0.80     0.87     0.88     0.86     0.85     0.86     0.82     0.82
0.85    0.88     0.84     0.73     0.81     0.84     0.86     0.75     0.81     0.82     0.80     0.38
SVN     0.82     0.89     0.91     0.87     0.89     0.87     0.91     0.87     0.87     0.75     0.89
0.83    0.85     0.92     0.73     0.79     0.86     0.90     0.82     0.83     0.78     0.74     0.81
23.34
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HOL     rls
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          AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA       HUN      POL      NZL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT
AUS       6.11
BEL       0.80     1.85
CAN       0.75     0.94     6.55
CHE       0.83     0.92     0.92     11.44
DEU       0.78     0.92     0.95     0.90     11.77
DFS       0.72     0.93     0.97     0.89     0.95     13.45
ESP       0.76     0.93     0.94     0.89     0.94     0.94     1.14
FRA       0.81     0.90     0.86     0.89     0.88     0.85     0.88     1.08
GBR       0.87     0.86     0.85     0.89     0.87     0.82     0.82     0.91     1.30
ITA       0.69     0.86     0.89     0.81     0.90     0.87     0.90     0.87     0.83     1.59
NLD       0.76     0.92     0.92     0.88     0.93     0.92     0.91     0.88     0.87     0.87     5.29
USA       0.73     0.94     0.96     0.87     0.93     0.95     0.94     0.86     0.83     0.89     0.90
1.65
HUN       0.75     0.91     0.93     0.86     0.94     0.91     0.94     0.87     0.84     0.91     0.87
0.93     1.07
POL       0.77     0.93     0.93     0.88     0.95     0.91     0.92     0.89     0.83     0.89     0.86
0.91     0.95     14.00
NZL       0.81     0.60     0.59     0.72     0.65     0.54     0.60     0.75     0.80     0.59     0.60
0.57     0.63     0.69     0.15
ZAF       0.89     0.86     0.83     0.88     0.81     0.77     0.83     0.87     0.91     0.81     0.83
0.82     0.82     0.82     0.76     11.05
JPN       0.71     0.90     0.97     0.88     0.94     0.96     0.93     0.85     0.80     0.87     0.89
0.94     0.90     0.93     0.59     0.76     1.70
CZE       0.75     0.91     0.92     0.81     0.94     0.91     0.89     0.84     0.84     0.86     0.88
0.91     0.92     0.95     0.62     0.81     0.91     16.27
EST       0.68     0.79     0.82     0.71     0.84     0.83     0.84     0.78     0.71     0.76     0.85
0.83     0.78     0.81     0.52     0.67     0.83     0.80     15.03
FRR       0.65     0.81     0.70     0.69     0.77     0.73     0.73     0.78     0.72     0.80     0.78
0.73     0.69     0.73     0.49     0.64     0.69     0.71     0.70     0.13
IRL       0.89     0.82     0.77     0.84     0.79     0.74     0.73     0.85     0.96     0.75     0.83
0.74     0.76     0.77     0.80     0.91     0.71     0.80     0.64     0.67     1.59
KOR       0.56     0.84     0.85     0.76     0.84     0.86     0.86     0.80     0.71     0.79     0.83
0.85     0.83     0.84     0.56     0.66     0.87     0.84     0.71     0.64     0.61     2.48
SVN       0.61     0.84     0.87     0.81     0.92     0.90     0.90     0.83     0.74     0.84     0.87
0.88     0.87     0.87     0.52     0.67     0.88     0.82     0.77     0.68     0.63     0.83     22.45
PRT       0.73     0.82     0.80     0.73     0.85     0.82     0.84     0.81     0.79     0.84     0.80
0.84     0.85     0.79     0.54     0.69     0.81     0.81     0.75     0.77     0.68     0.77     0.80
0.26


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HOL     rlr
--------------------------------------------------------------------------------
          AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA       HUN      POL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT
AUS      6.59
BEL      0.72     1.90
CAN      0.64     0.84     6.44
CHE      0.81     0.86     0.77    11.93
DEU      0.60     0.89     0.89     0.76    11.28
DFS      0.64     0.84     0.91     0.77     0.92    12.97
ESP      0.62     0.88     0.88     0.76     0.87     0.90     1.14
FRA      0.74     0.90     0.84     0.86     0.85     0.83     0.87     1.07
GBR      0.45     0.63     0.68     0.59     0.64     0.62     0.71     0.62     1.30
ITA      0.55     0.76     0.80     0.65     0.78     0.74     0.82     0.81     0.75     1.83
NLD      0.60     0.91     0.86     0.72     0.90     0.90     0.87     0.82     0.62     0.75     4.64
USA      0.58     0.79     0.88     0.69     0.78     0.83     0.81     0.76     0.71     0.87     0.81
1.84
HUN      0.64     0.87     0.79     0.82     0.82     0.82     0.81     0.87     0.53     0.79     0.84
0.81     1.14
POL      0.73     0.85     0.86     0.78     0.83     0.84     0.79     0.82     0.52     0.79     0.80
0.84     0.84    14.82
ZAF      0.67     0.75     0.59     0.71     0.54     0.55     0.52     0.65     0.44     0.61     0.57
0.71     0.67     0.74     9.52
JPN      0.68     0.78     0.90     0.80     0.82     0.91     0.81     0.83     0.50     0.70     0.82
0.79     0.78     0.80     0.56     1.78
CZE      0.57     0.82     0.80     0.72     0.83     0.78     0.79     0.76     0.56     0.81     0.79
0.77     0.83     0.85     0.63     0.74    16.20
EST      0.58     0.66     0.65     0.57     0.75     0.79     0.73     0.71     0.43     0.59     0.76
0.62     0.70     0.71     0.39     0.74     0.62    15.17
FRR      0.54     0.77     0.63     0.63     0.80     0.70     0.69     0.76     0.51     0.70     0.75
0.65     0.68     0.76     0.51     0.55     0.65     0.63     0.10
IRL      0.43     0.58     0.64     0.52     0.56     0.55     0.65     0.58     0.79     0.72     0.60
0.62     0.48     0.52     0.42     0.50     0.60     0.37     0.36     1.67
KOR      0.55     0.71     0.85     0.69     0.76     0.85     0.81     0.79     0.49     0.73     0.73
0.79     0.74     0.79     0.56     0.89     0.72     0.66     0.58     0.46     2.25
SVN      0.48     0.81     0.82     0.70     0.82     0.82     0.79     0.79     0.53     0.71     0.87
0.80     0.82     0.72     0.53     0.80     0.74     0.65     0.67     0.43     0.78    24.92
PRT      0.58     0.81     0.75     0.74     0.86     0.76     0.77     0.80     0.56     0.67     0.75
0.69     0.77     0.74     0.51     0.68     0.79     0.68     0.77     0.43     0.70     0.80     0.23

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HOL     fan
--------------------------------------------------------------------------------
          AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA       HUN      POL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT
AUS       5.81
BEL       0.73     2.02
CAN       0.67     0.84     6.56
CHE       0.72     0.89     0.74     11.15
DEU       0.72     0.85     0.85     0.70     12.87
DFS       0.63     0.91     0.88     0.76     0.85     13.24
ESP       0.70     0.77     0.87     0.65     0.87     0.82     1.04
FRA       0.82     0.77     0.78     0.69     0.88     0.69     0.83     1.05
GBR       0.82     0.76     0.83     0.64     0.89     0.72     0.86     0.92     1.36
ITA       0.55     0.71     0.78     0.59     0.77     0.72     0.80     0.74     0.76     1.62
NLD       0.75     0.80     0.78     0.67     0.89     0.76     0.80     0.85     0.88     0.73     5.28
USA       0.69     0.78     0.89     0.66     0.84     0.79     0.85     0.81     0.85     0.87     0.80
1.64
HUN       0.82     0.78     0.82     0.78     0.85     0.72     0.85     0.91     0.87     0.70     0.83
0.82     1.05
POL       0.66     0.76     0.82     0.72     0.71     0.74     0.74     0.75     0.76     0.73     0.65
0.80     0.80     13.35
ZAF       0.88     0.79     0.79     0.77     0.81     0.73     0.81     0.87     0.89     0.76     0.80
0.84     0.88     0.69     11.69
JPN       0.76     0.75     0.69     0.80     0.78     0.69     0.72     0.78     0.73     0.62     0.79
0.74     0.87     0.68     0.79     1.98
CZE       0.74     0.83     0.84     0.70     0.91     0.81     0.85     0.86     0.84     0.71     0.83
0.82     0.92     0.74     0.80     0.84     17.51
EST       0.66     0.66     0.68     0.57     0.72     0.67     0.77     0.75     0.68     0.58     0.79
0.73     0.77     0.62     0.64     0.73     0.78     15.62
FRR       0.57     0.78     0.61     0.61     0.75     0.68     0.65     0.73     0.65     0.66     0.76
0.60     0.55     0.47     0.63     0.55     0.67     0.57     0.11
IRL       0.77     0.76     0.83     0.61     0.85     0.73     0.81     0.82     0.95     0.74     0.81
0.79     0.78     0.74     0.83     0.60     0.78     0.59     0.61     1.66
KOR       0.59     0.62     0.73     0.47     0.76     0.64     0.77     0.78     0.77     0.70     0.74
0.78     0.79     0.69     0.65     0.64     0.78     0.59     0.50     0.66     1.80
SVN       0.34     0.53     0.60     0.37     0.71     0.71     0.73     0.58     0.62     0.65     0.60
0.64     0.55     0.52     0.47     0.47     0.67     0.50     0.50     0.61     0.60     22.62
PRT       0.57     0.53     0.59     0.42     0.76     0.61     0.72     0.76     0.70     0.64     0.71
0.75     0.67     0.42     0.66     0.66     0.73     0.69     0.58     0.56     0.74     0.66     0.18

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HOL     fua
--------------------------------------------------------------------------------
        AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA     HUN      POL      NZL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT
AUS     5.54
BEL     0.75     1.58
CAN     0.77     0.75     5.82
CHE     0.78     0.77     0.90    11.63
DEU     0.75     0.80     0.93     0.85    12.17
DFS     0.81     0.84     0.91     0.89     0.90    11.92
ESP     0.77     0.77     0.89     0.82     0.84     0.84     0.98
FRA     0.79     0.91     0.89     0.86     0.90     0.91     0.84     1.07
GBR     0.78     0.77     0.95     0.85     0.95     0.88     0.88     0.87     1.18
ITA     0.70     0.61     0.90     0.81     0.86     0.80     0.86     0.79     0.91     1.35
NLD     0.75     0.86     0.92     0.88     0.94     0.92     0.87     0.93     0.92     0.83     5.15
USA     0.73     0.66     0.95     0.84     0.89     0.85     0.90     0.82     0.94     0.94     0.88
1.43
HUN     0.80     0.75     0.91     0.87     0.88     0.89     0.83     0.85     0.87     0.82     0.87
0.84     1.06
POL     0.72     0.80     0.81     0.84     0.90     0.87     0.80     0.87     0.83     0.75     0.87
0.78     0.82    10.81
NZL     0.78     0.80     0.80     0.75     0.82     0.80     0.81     0.84     0.84     0.78     0.84
0.81     0.70     0.76     0.39
ZAF     0.81     0.82     0.91     0.83     0.92     0.89     0.86     0.86     0.94     0.82     0.89
0.86     0.88     0.83     0.79    11.05
JPN     0.72     0.72     0.95     0.90     0.87     0.92     0.81     0.84     0.90     0.88     0.89
0.91     0.87     0.80     0.77     0.85     1.68
CZE     0.79     0.84     0.91     0.86     0.94     0.92     0.82     0.91     0.92     0.79     0.92
0.82     0.94     0.90     0.75     0.94     0.87    15.25
EST     0.63     0.72     0.78     0.71     0.84     0.84     0.64     0.81     0.78     0.70     0.84
0.71     0.80     0.80     0.66     0.77     0.80     0.84    14.72
FRR     0.61     0.81     0.74     0.66     0.82     0.77     0.76     0.83     0.76     0.70     0.84
0.71     0.65     0.75     0.69     0.71     0.69     0.77     0.68     0.11
IRL     0.80     0.78     0.90     0.82     0.90     0.82     0.90     0.86     0.96     0.87     0.88
0.90     0.78     0.82     0.88     0.91     0.82     0.84     0.69     0.74     1.17
KOR     0.75     0.79     0.75     0.77     0.76     0.81     0.72     0.78     0.81     0.69     0.81
0.71     0.75     0.78     0.71     0.85     0.79     0.83     0.74     0.64     0.77     3.35
SVN     0.42     0.73     0.39     0.39     0.49     0.51     0.53     0.57     0.37     0.33     0.55
0.34     0.38     0.56     0.56     0.47     0.38     0.50     0.47     0.62     0.45     0.51    18.83
PRT     0.64     0.75     0.67     0.66     0.64     0.67     0.71     0.66     0.66     0.60     0.67
0.63     0.54     0.64     0.74     0.71     0.67     0.65     0.58     0.66     0.73     0.72     0.73
0.29

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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      FRR      IRL      KOR      SVN      PRT
AUS      5.08
BEL      0.83     1.35
CAN      0.77     0.91     5.63
CHE      0.75     0.88     0.91    10.85
DEU      0.82     0.88     0.87     0.86    13.19
DFS      0.79     0.90     0.89     0.91     0.94    11.59
ESP      0.83     0.84     0.85     0.85     0.90     0.91     0.94
FRA      0.78     0.89     0.91     0.88     0.91     0.92     0.89     1.10
GBR      0.84     0.81     0.81     0.82     0.87     0.90     0.89     0.88     1.20
ITA      0.76     0.74     0.74     0.76     0.84     0.86     0.92     0.82     0.89     1.29
NLD      0.78     0.85     0.81     0.84     0.93     0.95     0.92     0.87     0.89     0.88     4.79
USA      0.78     0.84     0.87     0.86     0.90     0.90     0.89     0.88     0.93     0.89     0.87
1.53
HUN      0.84     0.80     0.84     0.85     0.88     0.85     0.91     0.86     0.86     0.85     0.85
0.84     0.99
POL      0.74     0.80     0.70     0.76     0.84     0.86     0.85     0.80     0.82     0.83     0.86
0.78     0.81     7.69
NZL      0.84     0.78     0.80     0.81     0.83     0.83     0.82     0.82     0.90     0.83     0.82
0.88     0.85     0.74     0.38
ZAF      0.75     0.80     0.78     0.83     0.80     0.86     0.83     0.79     0.88     0.82     0.81
0.84     0.78     0.63     0.80    10.36
JPN      0.80     0.89     0.89     0.90     0.88     0.92     0.93     0.90     0.84     0.87     0.88
0.86     0.86     0.83     0.80     0.83     1.44
CZE      0.82     0.88     0.89     0.81     0.89     0.85     0.79     0.85     0.77     0.73     0.78
0.80     0.86     0.74     0.77     0.77     0.84    16.24
EST      0.71     0.78     0.75     0.70     0.75     0.80     0.80     0.73     0.73     0.75     0.79
0.77     0.74     0.76     0.68     0.68     0.78     0.76    13.62
FRR      0.70     0.82     0.69     0.70     0.81     0.78     0.77     0.78     0.71     0.76     0.78
0.75     0.63     0.80     0.64     0.61     0.74     0.70     0.68     0.10
IRL      0.78     0.77     0.78     0.80     0.83     0.88     0.89     0.83     0.97     0.90     0.86
0.92     0.84     0.81     0.89     0.86     0.82     0.72     0.73     0.66     1.04
KOR      0.70     0.86     0.84     0.78     0.72     0.73     0.77     0.77     0.63     0.66     0.70
0.73     0.76     0.63     0.64     0.66     0.83     0.78     0.68     0.64     0.60     3.96
SVN      0.63     0.82     0.73     0.68     0.78     0.75     0.75     0.76     0.59     0.61     0.76
0.66     0.67     0.69     0.61     0.57     0.73     0.70     0.73     0.70     0.57     0.70    17.93
PRT      0.77     0.80     0.71     0.71     0.80     0.80     0.85     0.80     0.84     0.84     0.82
0.80     0.82     0.80     0.72     0.75     0.78     0.74     0.63     0.70     0.83     0.69     0.64
0.33

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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      FRR      IRL      KOR      SVN      PRT
AUS       5.98
BEL       0.69     1.41
CAN       0.82     0.77     5.48
CHE       0.76     0.89     0.90    11.90
DEU       0.75     0.78     0.90     0.90    11.59
DFS       0.71     0.87     0.82     0.90     0.80    11.79
ESP       0.79     0.69     0.85     0.79     0.73     0.79     0.89
FRA       0.76     0.87     0.80     0.86     0.74     0.91     0.82     1.08
GBR       0.84     0.68     0.86     0.81     0.76     0.84     0.91     0.89     1.24
ITA       0.77     0.72     0.86     0.79     0.79     0.80     0.90     0.81     0.87     1.45
NLD       0.80     0.81     0.86     0.85     0.78     0.90     0.88     0.92     0.92     0.83     4.62
USA       0.80     0.71     0.86     0.79     0.75     0.86     0.91     0.89     0.94     0.90     0.91
1.51
HUN       0.74     0.91     0.83     0.93     0.84     0.92     0.79     0.91     0.78     0.80     0.84
0.82     0.99
POL       0.76     0.82     0.84     0.88     0.90     0.83     0.76     0.73     0.72     0.81     0.76
0.76     0.86    10.31
NZL       0.68     0.32     0.60     0.45     0.47     0.38     0.65     0.45     0.61     0.66     0.54
0.63     0.42     0.48     0.37
ZAF       0.86     0.69     0.76     0.75     0.65     0.81     0.84     0.83     0.88     0.82     0.85
0.89     0.80     0.70     0.67    11.12
JPN       0.61     0.94     0.69     0.83     0.68     0.83     0.60     0.88     0.65     0.65     0.77
0.69     0.87     0.69     0.30     0.66     1.69
CZE       0.62     0.88     0.78     0.87     0.89     0.79     0.63     0.72     0.63     0.73     0.70
0.66     0.89     0.87     0.34     0.61     0.76    14.11
EST       0.66     0.83     0.77     0.77     0.84     0.80     0.63     0.75     0.65     0.68     0.79
0.68     0.82     0.82     0.37     0.60     0.77     0.83    14.70
FRR       0.62     0.69     0.68     0.68     0.65     0.75     0.75     0.73     0.74     0.71     0.85
0.72     0.62     0.61     0.45     0.63     0.60     0.56     0.63     0.11
IRL       0.85     0.72     0.89     0.84     0.79     0.79     0.91     0.85     0.95     0.90     0.88
0.91     0.80     0.76     0.71     0.85     0.66     0.70     0.66     0.69     1.07
KOR       0.73     0.76     0.84     0.81     0.84     0.74     0.73     0.68     0.64     0.80     0.69
0.73     0.80     0.83     0.48     0.68     0.68     0.75     0.70     0.56     0.71     2.99
SVN       0.55     0.70     0.72     0.72     0.84     0.63     0.59     0.51     0.49     0.62     0.58
0.53     0.68     0.81     0.40     0.41     0.55     0.83     0.75     0.54     0.59     0.68    21.72
PRT       0.73     0.67     0.76     0.75     0.83     0.70     0.78     0.67     0.73     0.83     0.72
0.74     0.72     0.79     0.59     0.68     0.54     0.74     0.72     0.67     0.80     0.78     0.76
0.33

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HOL   ude

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT
AUS	4.42																						
BEL	0.94	1.45																					
CAN	0.93	0.96	5.81																				
CHE	0.96	0.96	0.95	11.43																			
DEU	0.94	0.96	0.98	0.96	12.98																		
DFS	0.93	0.95	0.97	0.96	0.97	11.47																	
ESP	0.95	0.96	0.98	0.96	0.97	0.97	1.13																
FRA	0.96	0.96	0.97	0.97	0.97	0.97	0.97	1.10															
GBR	0.95	0.96	0.97	0.95	0.96	0.96	0.96	0.96	1.17														
ITA	0.93	0.93	0.97	0.95	0.96	0.95	0.98	0.97	0.94	1.37													
NLD	0.94	0.96	0.96	0.96	0.98	0.98	0.96	0.98	0.97	0.95	5.10												
USA	0.94	0.95	0.97	0.96	0.96	0.97	0.97	0.98	0.97	0.97	0.97	1.49											
HUN	0.93	0.96	0.97	0.96	0.96	0.97	0.98	0.96	0.95	0.97	0.95	0.97	1.14										
POL	0.95	0.95	0.95	0.96	0.96	0.95	0.95	0.96	0.94	0.94	0.96	0.95	0.96	9.81									
ZAF	0.95	0.96	0.98	0.95	0.97	0.95	0.97	0.96	0.98	0.95	0.96	0.97	0.97	0.95	11.90								
JPN	0.94	0.94	0.97	0.95	0.94	0.97	0.97	0.97	0.95	0.96	0.95	0.97	0.96	0.94	0.96	1.35							
CZE	0.93	0.96	0.98	0.95	0.98	0.95	0.96	0.95	0.95	0.96	0.95	0.94	0.97	0.96	0.97	0.94	14.77						
EST	0.89	0.92	0.94	0.89	0.94	0.95	0.94	0.91	0.92	0.92	0.94	0.94	0.94	0.94	0.93	0.92	0.94	13.60					
FRR	0.88	0.93	0.90	0.92	0.94	0.91	0.92	0.94	0.90	0.92	0.95	0.91	0.88	0.90	0.88	0.89	0.89	0.87	0.10				
IRL	0.95	0.96	0.95	0.94	0.94	0.93	0.94	0.94	0.99	0.92	0.95	0.95	0.93	0.93	0.97	0.94	0.93	0.89	0.87	1.29			
KOR	0.88	0.84	0.88	0.90	0.86	0.88	0.90	0.90	0.87	0.91	0.87	0.91	0.88	0.86	0.88	0.93	0.84	0.81	0.84	0.85	5.01		
SVN	0.82	0.88	0.89	0.89	0.92	0.91	0.90	0.88	0.85	0.89	0.90	0.89	0.91	0.91	0.87	0.85	0.91	0.88	0.84	0.82	0.77	16.98	
PRT	0.89	0.93	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.91	0.93	0.89	0.92	0.91	0.94	0.90	0.89	0.90	0.84	0.84	0.45

HOL   ftp

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT
AUS	5.40																							
BEL	0.94	1.42																						
CAN	0.96	0.95	5.94																					
CHE	0.97	0.96	0.97	11.81																				
DEU	0.95	0.92	0.98	0.96	13.74																			
DFS	0.91	0.95	0.96	0.95	0.95	10.82																		
ESP	0.94	0.90	0.97	0.95	0.96	0.91	1.00																	
FRA	0.94	0.98	0.96	0.97	0.95	0.96	0.92	1.12																
GBR	0.95	0.89	0.97	0.94	0.96	0.93	0.96	0.91	1.23															
ITA	0.82	0.80	0.88	0.81	0.85	0.86	0.85	0.82	0.88	1.24														
NLD	0.93	0.94	0.97	0.95	0.98	0.96	0.94	0.96	0.94	0.85	4.78													
USA	0.88	0.86	0.94	0.88	0.92	0.93	0.92	0.88	0.95	0.90	0.91	1.41												
HUN	0.97	0.92	0.97	0.95	0.96	0.91	0.97	0.94	0.94	0.86	0.92	0.90	1.03											
POL	0.91	0.87	0.94	0.90	0.95	0.91	0.92	0.90	0.93	0.87	0.94	0.90	0.93	9.52										
NZL	0.93	0.88	0.90	0.89	0.88	0.87	0.88	0.90	0.91	0.79	0.88	0.88	0.89	0.85	0.30									
ZAF	0.95	0.91	0.97	0.95	0.94	0.92	0.95	0.93	0.95	0.87	0.94	0.90	0.96	0.90	0.89	10.69								
JPN	0.95	0.97	0.96	0.97	0.95	0.95	0.93	0.98	0.91	0.79	0.96	0.86	0.94	0.91	0.89	0.93	1.43							
CZE	0.95	0.93	0.96	0.95	0.95	0.92	0.95	0.93	0.92	0.81	0.94	0.88	0.97	0.91	0.88	0.95	0.94	12.80						
EST	0.87	0.88	0.91	0.86	0.90	0.89	0.89	0.89	0.87	0.79	0.92	0.83	0.89	0.88	0.79	0.86	0.90	0.90	13.08					
FRR	0.84	0.90	0.91	0.91	0.92	0.90	0.89	0.91	0.86	0.81	0.92	0.84	0.87	0.86	0.78	0.85	0.88	0.88	0.84	0.10				
IRL	0.95	0.87	0.96	0.93	0.95	0.91	0.94	0.90	0.99	0.86	0.93	0.93	0.93	0.91	0.90	0.94	0.90	0.90	0.84	0.83	1.36			
KOR	0.92	0.92	0.91	0.92	0.91	0.92	0.90	0.92	0.87	0.80	0.89	0.85	0.93	0.86	0.84	0.90	0.92	0.92	0.83	0.83	0.86	3.71		
SVN	0.90	0.89	0.93	0.91	0.94	0.89	0.94	0.90	0.92	0.82	0.92	0.88	0.91	0.91	0.83	0.87	0.91	0.89	0.87	0.85	0.90	0.87	18.06	
PRT	0.92	0.86	0.93	0.89	0.93	0.87	0.92	0.84	0.93	0.81	0.89	0.88	0.93	0.91	0.81	0.89	0.88	0.92	0.88	0.84	0.92	0.89	0.90	0.45

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HOL     ftl
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          AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA       HUN      POL      ZAF      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT
AUS      5.91
BEL      0.96     1.53
CAN      0.95     0.92     5.73
CHE      0.94     0.94     0.90    11.58
DEU      0.96     0.98     0.94     0.94    13.52
DFS      0.97     0.97     0.94     0.97     0.98    10.90
ESP      0.97     0.98     0.94     0.95     0.98     0.97     1.13
FRA      0.95     0.90     0.98     0.88     0.93     0.92     0.92     1.07
GBR      0.96     0.97     0.95     0.94     0.98     0.97     0.97     0.94     1.33
ITA      0.91     0.91     0.92     0.91     0.93     0.93     0.93     0.91     0.96     1.62
NLD      0.96     0.98     0.93     0.95     0.98     0.97     0.98     0.90     0.97     0.92     5.00
USA      0.95     0.94     0.96     0.92     0.96     0.96     0.96     0.94     0.97     0.95     0.95
1.47
HUN      0.94     0.97     0.89     0.96     0.96     0.96     0.96     0.85     0.93     0.87     0.97
0.91     0.96
POL      0.97     0.96     0.92     0.96     0.97     0.97     0.97     0.90     0.96     0.91     0.97
0.95     0.97    11.95
ZAF      0.96     0.96     0.90     0.95     0.94     0.96     0.96     0.87     0.95     0.92     0.95
0.94     0.95     0.96    11.02
JPN      0.97     0.98     0.94     0.96     0.98     0.98     0.98     0.93     0.97     0.94     0.98
0.97     0.96     0.97     0.96     1.49
CZE      0.95     0.96     0.92     0.96     0.97     0.98     0.97     0.90     0.97     0.91     0.97
0.95     0.96     0.97     0.96     0.97    14.27
EST      0.92     0.92     0.90     0.92     0.95     0.95     0.93     0.89     0.92     0.88     0.94
0.91     0.94     0.96     0.90     0.94     0.95    13.75
FRR      0.89     0.94     0.90     0.92     0.95     0.94     0.93     0.88     0.94     0.90     0.93
0.92     0.90     0.92     0.88     0.92     0.93     0.89     0.13
IRL      0.96     0.96     0.95     0.92     0.98     0.95     0.96     0.94     0.99     0.95     0.96
0.96     0.92     0.96     0.94     0.96     0.96     0.92     0.92     1.76
KOR      0.92     0.95     0.88     0.93     0.94     0.94     0.94     0.85     0.92     0.87     0.94
0.92     0.93     0.93     0.92     0.96     0.94     0.89     0.89     0.90     5.02
SVN      0.92     0.94     0.89     0.93     0.95     0.95     0.96     0.86     0.94     0.90     0.95
0.92     0.93     0.94     0.93     0.94     0.94     0.89     0.89     0.93     0.91    18.04
PRT      0.91     0.93     0.91     0.93     0.95     0.94     0.94     0.87     0.94     0.88     0.95
0.93     0.93     0.95     0.88     0.93     0.94     0.92     0.92     0.94     0.93     0.91     0.36

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HOL    rtp
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        AUS      BEL      CAN      CHE      DEU      DFS      ESP      FRA      GBR      ITA      NLD
USA     POL      NZL      JPN      CZE      EST      FRR      IRL      KOR      SVN      PRT      ZAF
AUS     5.54
BEL     0.96     1.41
CAN     0.97     0.96     6.06
CHE     0.96     0.97     0.98     11.89
DEU     0.94     0.96     0.97     0.96     13.74
DFS     0.92     0.94     0.96     0.95     0.97     10.97
ESP     0.94     0.96     0.97     0.95     0.97     0.96     0.94
FRA     0.96     0.97     0.97     0.97     0.97     0.96     0.97     1.06
GBR     0.96     0.95     0.97     0.95     0.97     0.97     0.96     0.98     1.31
ITA     0.85     0.90     0.88     0.88     0.94     0.93     0.91     0.91     0.91     1.27
NLD     0.95     0.95     0.97     0.96     0.98     0.97     0.97     0.97     0.97     0.91     4.84
USA     0.92     0.92     0.94     0.91     0.95     0.96     0.95     0.94     0.97     0.90     0.95
1.63
POL     0.89     0.93     0.93     0.92     0.97     0.94     0.96     0.95     0.94     0.91     0.95
0.92   10.57
NZL     0.96     0.94     0.94     0.94     0.95     0.92     0.92     0.95     0.95     0.88     0.93
0.89    0.92     0.45
JPN     0.96     0.97     0.98     0.97     0.97     0.97     0.97     0.98     0.97     0.90     0.97
0.95    0.95     0.94     1.55
CZE     0.91     0.95     0.94     0.92     0.97     0.94     0.95     0.95     0.95     0.90     0.94
0.93    0.96     0.93     0.94    13.95
EST     0.91     0.93     0.93     0.91     0.96     0.92     0.93     0.93     0.94     0.90     0.94
0.91    0.93     0.90     0.93     0.94    13.32
FRR     0.82     0.83     0.81     0.82     0.81     0.79     0.77     0.84     0.83     0.75     0.77
0.80    0.73     0.78     0.78     0.79     0.80     0.10
IRL     0.94     0.94     0.96     0.95     0.95     0.95     0.94     0.96     0.97     0.88     0.95
0.93    0.91     0.94     0.95     0.92     0.89     0.82     1.26
KOR     0.88     0.90     0.92     0.91     0.93     0.94     0.95     0.94     0.92     0.93     0.93
0.93    0.92     0.87     0.94     0.89     0.87     0.74     0.90     2.55
SVN     0.88     0.90     0.90     0.90     0.93     0.87     0.94     0.90     0.89     0.87     0.89
0.86    0.91     0.88     0.88     0.90     0.88     0.74     0.87     0.88    15.63
PRT     0.87     0.90     0.91     0.87     0.93     0.91     0.92     0.92     0.93     0.88     0.90
0.92    0.92     0.87     0.92     0.93     0.89     0.80     0.92     0.91     0.88     0.48
ZAF     0.90     0.89     0.91     0.85     0.89     0.85     0.88     0.87     0.86     0.81     0.87
0.87    0.84     0.86     0.89     0.86     0.86     0.75     0.85     0.83     0.83     0.84     7.81

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HOL     ocs
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        AUS     BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD
USA     HUN     POL     NZL     JPN     CZE     EST     FRR     IRL     KOR     SVN     PRT
AUS     6.36
BEL     0.59    1.22
CAN     0.58    0.71    5.45
CHE     0.52    0.79    0.92    11.74
DEU     0.62    0.61    0.86    0.83    13.02
DFS     0.64    0.65    0.81    0.78    0.87    10.33
ESP     0.66    0.63    0.81    0.76    0.87    0.86    0.89
FRA     0.58    0.73    0.80    0.84    0.84    0.86    0.86    1.12
GBR     0.69    0.71    0.87    0.88    0.92    0.88    0.87    0.90    0.94
ITA     0.58    0.63    0.82    0.79    0.82    0.81    0.85    0.87    0.86    0.81
NLD     0.62    0.69    0.81    0.81    0.89    0.89    0.87    0.86    0.90    0.81    3.02
USA     0.64    0.66    0.87    0.83    0.89    0.88    0.87    0.86    0.91    0.85    0.88
0.91
HUN     0.53    0.73    0.83    0.83    0.84    0.76    0.79    0.82    0.83    0.80    0.76
0.80    1.01
POL     0.43    0.59    0.54    0.56    0.55    0.63    0.63    0.69    0.64    0.65    0.62
0.64    0.62    7.08
NZL     0.81    0.54    0.66    0.64    0.67    0.59    0.64    0.59    0.72    0.54    0.66
0.70    0.55    0.37    0.32
JPN     0.52    0.79    0.88    0.90    0.76    0.79    0.78    0.85    0.83    0.83    0.81
0.85    0.71    0.70    0.57    0.70
CZE     0.64    0.63    0.84    0.78    0.88    0.78    0.78    0.75    0.83    0.75    0.79
0.80    0.85    0.54    0.74    0.66    15.44
EST     0.50    0.59    0.75    0.62    0.78    0.65    0.61    0.65    0.64    0.66    0.72
0.66    0.70    0.39    0.46    0.60    0.75    13.46
FRR     0.62    0.73    0.63    0.67    0.79    0.75    0.74    0.76    0.79    0.77    0.80
0.72    0.70    0.74    0.49    0.69    0.70    0.66    0.10
IRL     0.63    0.48    0.72    0.69    0.77    0.67    0.70    0.63    0.77    0.67    0.62
0.70    0.70    0.40    0.57    0.55    0.72    0.58    0.56    1.08
KOR     0.51    0.45    0.51    0.54    0.53    0.50    0.59    0.57    0.52    0.63    0.52
0.56    0.49    0.57    0.35    0.59    0.40    0.45    0.55    0.43    7.23
SVN     0.39    0.50    0.55    0.51    0.67    0.59    0.72    0.70    0.58    0.66    0.60
0.64    0.60    0.68    0.38    0.64    0.57    0.51    0.65    0.40    0.54    20.35
PRT     0.54    0.63    0.69    0.69    0.79    0.79    0.76    0.74    0.78    0.76    0.76
0.73    0.69    0.55    0.41    0.69    0.71    0.66    0.76    0.61    0.59    0.68    0.58

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HOL   ous

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	JPN	CZE	EST	FRR	IRL	SVN	PRT
AUS	4.34																					
BEL	0.57	1.33																				
CAN	0.66	0.77	5.36																			
CHE	0.66	0.85	0.93	11.70																		
DEU	0.65	0.79	0.90	0.88	13.53																	
DFS	0.43	0.82	0.86	0.90	0.88	12.78																
ESP	0.61	0.70	0.86	0.86	0.87	0.85	1.05															
FRA	0.55	0.81	0.85	0.91	0.89	0.94	0.86	1.03														
GBR	0.80	0.65	0.84	0.84	0.86	0.68	0.86	0.75	1.12													
ITA	0.65	0.71	0.89	0.88	0.86	0.83	0.94	0.88	0.85	1.03												
NLD	0.62	0.84	0.89	0.92	0.91	0.87	0.87	0.91	0.84	0.86	4.87											
USA	0.68	0.77	0.93	0.91	0.89	0.86	0.92	0.88	0.89	0.94	0.90	1.15										
HUN	0.59	0.82	0.86	0.89	0.88	0.86	0.86	0.83	0.75	0.83	0.81	0.83	1.12									
POL	0.66	0.77	0.69	0.76	0.77	0.68	0.65	0.69	0.75	0.68	0.73	0.71	0.66	8.07								
NZL	0.77	0.75	0.82	0.88	0.81	0.76	0.74	0.83	0.81	0.76	0.83	0.85	0.77	0.74	0.43							
JPN	0.71	0.83	0.92	0.89	0.87	0.79	0.80	0.83	0.87	0.87	0.87	0.92	0.76	0.77	0.81	0.76						
CZE	0.58	0.83	0.89	0.90	0.93	0.91	0.85	0.91	0.77	0.86	0.88	0.85	0.91	0.75	0.78	0.82	17.29					
EST	0.50	0.74	0.79	0.74	0.82	0.86	0.77	0.84	0.64	0.78	0.80	0.81	0.78	0.66	0.66	0.74	0.84	13.69				
FRR	0.56	0.81	0.68	0.74	0.85	0.73	0.76	0.75	0.71	0.71	0.83	0.73	0.70	0.70	0.61	0.73	0.76	0.64	0.10			
IRL	0.83	0.62	0.78	0.79	0.79	0.61	0.79	0.69	0.96	0.78	0.76	0.83	0.71	0.76	0.81	0.82	0.70	0.57	0.63	0.98		
SVN	0.44	0.52	0.48	0.44	0.51	0.40	0.41	0.42	0.41	0.43	0.53	0.48	0.39	0.62	0.49	0.53	0.48	0.48	0.43	0.44	20.79	
PRT	0.71	0.74	0.79	0.78	0.80	0.72	0.79	0.75	0.78	0.79	0.79	0.80	0.74	0.71	0.73	0.78	0.79	0.68	0.73	0.77	0.56	0.95

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	JPN	CZE	EST	IRL	SVN	PRT
AUS	5.81																			
BEL	0.48	1.78																		
CAN	0.29	0.76	6.23																	
CHE	0.35	0.81	0.89	11.46																
DEU	0.31	0.74	0.85	0.76	11.90															
DFS	0.31	0.67	0.87	0.79	0.79	13.08														
ESP	0.27	0.71	0.82	0.73	0.74	0.83	0.97													
FRA	0.32	0.77	0.67	0.64	0.74	0.60	0.72	1.08												
GBR	0.32	0.74	0.79	0.77	0.77	0.71	0.82	0.82	1.24											
ITA	0.33	0.70	0.70	0.64	0.71	0.54	0.67	0.78	0.73	1.66										
NLD	0.30	0.81	0.67	0.62	0.72	0.59	0.65	0.81	0.76	0.66	5.13									
USA	0.41	0.75	0.83	0.73	0.75	0.66	0.73	0.72	0.75	0.76	0.67	1.58								
HUN	0.46	0.71	0.60	0.59	0.66	0.40	0.57	0.76	0.66	0.75	0.69	0.72	1.08							
POL	0.45	0.76	0.74	0.70	0.74	0.53	0.62	0.69	0.67	0.75	0.55	0.81	0.70	11.36						
JPN	0.34	0.66	0.87	0.80	0.76	0.72	0.67	0.57	0.64	0.69	0.56	0.86	0.53	0.73	0.64					
CZE	0.43	0.78	0.81	0.72	0.79	0.59	0.61	0.65	0.68	0.75	0.62	0.84	0.79	0.86	0.74	15.87				
EST	0.36	0.65	0.55	0.43	0.62	0.55	0.65	0.72	0.58	0.66	0.72	0.66	0.66	0.64	0.54	0.66	15.15			
IRL	0.40	0.79	0.79	0.83	0.72	0.70	0.74	0.68	0.84	0.69	0.68	0.73	0.70	0.69	0.71	0.72	0.50	1.46		
SVN	0.49	0.59	0.62	0.52	0.55	0.48	0.52	0.62	0.51	0.65	0.66	0.75	0.70	0.53	0.65	0.67	0.61	0.49	26.31	
PRT	0.27	0.58	0.52	0.38	0.63	0.47	0.62	0.75	0.65	0.68	0.70	0.65	0.68	0.49	0.50	0.64	0.81	0.47	0.71	0.40

```
HOL     loc
--------------------------------------------------------------------------------
         BEL     CAN     CHE     DEU     DFS     ESP     FRA     GBR     ITA     NLD     USA
CZE     IRL     KOR     SVN     PRT
BEL      1.90
CAN      0.84    6.44
CHE      0.58    0.63   11.81
DEU      0.62    0.73    0.67   11.93
DFS      0.85    0.91    0.55    0.67   12.96
ESP      0.53    0.69    0.70    0.78    0.69    0.98
FRA      0.76    0.75    0.70    0.82    0.69    0.72    1.08
GBR      0.61    0.66    0.86    0.79    0.60    0.78    0.84    1.30
ITA      0.57    0.67    0.65    0.71    0.56    0.70    0.76    0.75    1.92
NLD      0.83    0.77    0.64    0.83    0.76    0.66    0.80    0.72    0.60    4.72
USA      0.54    0.71    0.53    0.78    0.65    0.71    0.75    0.70    0.80    0.60    1.58
CZE      0.33    0.51    0.52    0.65    0.49    0.56    0.61    0.62    0.63    0.44    0.70
22.56
IRL      0.61    0.63    0.67    0.69    0.57    0.71    0.73    0.78    0.63    0.64    0.66
0.41    1.67
KOR      0.55    0.76    0.52    0.52    0.73    0.64    0.62    0.63    0.57    0.50    0.56
0.58    0.59   10.81
SVN      0.66    0.72    0.64    0.64    0.73    0.68    0.71    0.68    0.72    0.71    0.64
0.69    0.49    0.67   29.48
PRT      0.28    0.49    0.47    0.61    0.43    0.55    0.52    0.59    0.50    0.49    0.47
0.65    0.43    0.52    0.61    0.23


--------------------------------------------------------------------------------
HOL     bcs
--------------------------------------------------------------------------------
         BEL     CHE     DEU     DFS     FRA     GBR     ITA     NLD     USA     CZE     FRR
JPN     IRL     KOR     CAN     PRT     ESP
BEL      1.10
CHE      0.70   11.74
DEU      0.75    0.91   13.02
DFS      0.76    0.88    0.95   12.18
FRA      0.74    0.94    0.93    0.94    1.01
GBR      0.75    0.92    0.90    0.86    0.94    1.25
ITA      0.73    0.91    0.95    0.94    0.95    0.90    6.64
NLD      0.74    0.93    0.95    0.95    0.95    0.91    0.93    4.92
USA      0.79    0.66    0.73    0.76    0.76    0.75    0.76    0.71    1.38
CZE      0.76    0.87    0.95    0.93    0.91    0.87    0.94    0.93    0.70   12.62
FRR      0.70    0.84    0.81    0.73    0.81    0.83    0.77    0.85    0.58    0.75    0.08
JPN      0.75    0.92    0.94    0.95    0.96    0.92    0.95    0.94    0.77    0.92    0.75
1.60
IRL      0.66    0.89    0.83    0.82    0.89    0.95    0.83    0.87    0.64    0.80    0.76
0.87    1.03
KOR      0.60    0.78    0.78    0.80    0.80    0.76    0.81    0.73    0.64    0.76    0.60
0.81    0.68    2.63
CAN      0.76    0.93    0.93    0.93    0.94    0.96    0.93    0.95    0.76    0.92    0.77
0.97    0.91    0.78    6.14
PRT      0.71    0.88    0.87    0.86    0.89    0.86    0.89    0.89    0.72    0.88    0.75
0.87    0.77    0.78    0.89    0.36
ESP      0.79    0.89    0.94    0.94    0.95    0.94    0.93    0.94    0.75    0.93    0.82
0.94    0.88    0.83    0.95    0.89    1.12


--------------------------------------------------------------------------------
```

```
JER    sta
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      USA      ZAF      NLD
AUS      6.14
CAN      0.85     6.13
DFS      0.86     0.95    11.91
GBR      0.88     0.94     0.93     1.03
ITA      0.87     0.95     0.91     0.96     1.22
NZL      0.88     0.87     0.85     0.93     0.90     0.36
USA      0.89     0.97     0.94     0.96     0.94     0.90     1.40
ZAF      0.81     0.86     0.84     0.94     0.93     0.94     0.90     9.63
NLD      0.89     0.95     0.96     0.94     0.93     0.85     0.94     0.87     4.91


--------------------------------------------------------------------------------
JER    cwi
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      USA      ZAF      NLD
AUS      5.46
CAN      0.68     6.54
DFS      0.81     0.82    15.37
GBR      0.76     0.87     0.82     1.60
ITA      0.60     0.90     0.75     0.77     1.34
NZL      0.82     0.59     0.69     0.79     0.52     0.36
USA      0.74     0.93     0.78     0.81     0.92     0.58     0.94
ZAF      0.83     0.83     0.71     0.88     0.72     0.80     0.83     9.39
NLD      0.72     0.80     0.90     0.77     0.73     0.64     0.83     0.75     4.38


--------------------------------------------------------------------------------
JER    bde
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      ZAF      NLD
AUS      5.37
CAN      0.75     5.88
DFS      0.84     0.86    13.51
GBR      0.68     0.79     0.79     1.59
ITA      0.51     0.70     0.73     0.83     1.37
NZL      0.75     0.60     0.64     0.66     0.64     0.36
ZAF      0.92     0.73     0.83     0.76     0.59     0.77     9.81
NLD      0.63     0.84     0.85     0.77     0.84     0.52     0.62     3.27


--------------------------------------------------------------------------------
JER    ang
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      USA      ZAF      NLD
AUS      6.47
CAN      0.57     7.18
DFS      0.69     0.76    13.30
GBR      0.85     0.69     0.87     1.16
ITA      0.70     0.72     0.85     0.87     1.27
USA      0.80     0.79     0.87     0.84     0.77     0.98
ZAF      0.71     0.64     0.79     0.87     0.75     0.79     9.59
NLD      0.76     0.68     0.64     0.76     0.63     0.74     0.59     3.59


--------------------------------------------------------------------------------
JER    ran
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      USA      ZAF      NLD
AUS      5.81
CAN      0.88     5.75
DFS      0.89     0.95    11.48
GBR      0.96     0.94     0.95     1.22
ITA      0.85     0.95     0.93     0.90     1.44
NZL      0.96     0.84     0.86     0.92     0.82     0.29
USA      0.92     0.93     0.94     0.97     0.90     0.91     1.11
ZAF      0.97     0.89     0.90     0.97     0.84     0.92     0.95    10.18
NLD      0.88     0.90     0.94     0.94     0.85     0.85     0.94     0.91     4.73


--------------------------------------------------------------------------------
```

```
JER     rwi
------------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD
AUS     6.07
CAN     0.87    6.50
DFS     0.79    0.87   11.94
GBR     0.80    0.94    0.86    1.37
ITA     0.65    0.79    0.79    0.76    1.46
NZL     0.89    0.85    0.80    0.79    0.65    0.28
USA     0.55    0.76    0.66    0.79    0.82    0.54    0.82
ZAF     0.78    0.77    0.69    0.80    0.57    0.70    0.61   10.50
NLD     0.80    0.77    0.87    0.65    0.65    0.80    0.52    0.65    4.13


------------------------------------------------------------------------------------
JER     rls
------------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD
AUS     7.35
CAN     0.47    5.69
DFS     0.54    0.92   12.90
GBR     0.70    0.82    0.77    1.74
ITA     0.43    0.76    0.79    0.77    1.55
NZL     0.69    0.57    0.55    0.75    0.71    0.12
USA     0.60    0.90    0.90    0.90    0.82    0.72    0.68
ZAF     0.88    0.66    0.64    0.87    0.67    0.86    0.82   13.50
NLD     0.60    0.83    0.89    0.77    0.88    0.64    0.83    0.69    3.51


------------------------------------------------------------------------------------
JER     rlr
------------------------------------------------------------------------------------
        AUS     CAN     DFS     ITA     ZAF     NLD
AUS     7.85
CAN     0.33    7.00
DFS     0.53    0.77   12.87
ITA     0.42    0.52    0.56    1.10
ZAF     0.29    0.38    0.55    0.73   14.38
NLD     0.61    0.75    0.86    0.78    0.68    5.06


------------------------------------------------------------------------------------
JER     fan
------------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     USA     ZAF     NLD
AUS     6.94
CAN     0.66    5.52
DFS     0.67    0.86   12.85
GBR     0.78    0.80    0.72    1.36
ITA     0.54    0.79    0.63    0.81    1.80
USA     0.67    0.88    0.78    0.85    0.86    0.76
ZAF     0.77    0.72    0.76    0.90    0.78    0.82   10.85
NLD     0.68    0.82    0.77    0.89    0.80    0.83    0.81    4.77


------------------------------------------------------------------------------------
JER     fua
------------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD
AUS     5.87
CAN     0.66    5.16
DFS     0.80    0.83   12.70
GBR     0.77    0.92    0.82    1.58
ITA     0.62    0.84    0.79    0.85    1.50
NZL     0.84    0.62    0.70    0.77    0.57    0.40
USA     0.77    0.93    0.85    0.92    0.85    0.68    1.16
ZAF     0.74    0.91    0.85    0.95    0.88    0.71    0.92   12.60
NLD     0.80    0.82    0.91    0.88    0.82    0.79    0.84    0.86    5.10


------------------------------------------------------------------------------------
```

```
JER     ruh
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      USA      ZAF      NLD
AUS      5.42
CAN      0.68     6.95
DFS      0.72     0.88    11.11
GBR      0.82     0.84     0.83     1.17
ITA      0.77     0.85     0.82     0.90     1.37
NZL      0.70     0.71     0.79     0.70     0.80     0.40
USA      0.80     0.85     0.88     0.88     0.85     0.72     1.13
ZAF      0.83     0.76     0.84     0.83     0.81     0.75     0.90    10.04
NLD      0.76     0.85     0.92     0.89     0.87     0.76     0.84     0.77     4.76


--------------------------------------------------------------------------------
JER     usu
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      USA      ZAF      NLD
AUS      5.38
CAN      0.83     6.51
DFS      0.74     0.86    12.86
GBR      0.85     0.90     0.84     1.69
ITA      0.49     0.70     0.65     0.58     1.57
NZL      0.50     0.50     0.39     0.60     0.57     0.38
USA      0.73     0.85     0.87     0.77     0.63     0.31     0.83
ZAF      0.84     0.88     0.80     0.85     0.60     0.39     0.83    11.43
NLD      0.79     0.81     0.88     0.75     0.76     0.53     0.84     0.76     5.30


--------------------------------------------------------------------------------
JER     ude
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      USA      ZAF      NLD
AUS      5.43
CAN      0.94     4.88
DFS      0.93     0.93    12.22
GBR      0.93     0.94     0.92     1.55
ITA      0.95     0.93     0.93     0.88     1.41
USA      0.93     0.97     0.95     0.92     0.93     1.51
ZAF      0.96     0.94     0.93     0.93     0.95     0.95    11.76
NLD      0.94     0.94     0.95     0.92     0.95     0.92     0.92     4.62


--------------------------------------------------------------------------------
JER     ftp
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      NZL      USA      ZAF      NLD
AUS      6.07
CAN      0.88     5.85
DFS      0.86     0.94    13.03
GBR      0.89     0.88     0.88     1.40
ITA      0.61     0.77     0.79     0.61     1.64
NZL      0.90     0.91     0.85     0.84     0.71     0.30
USA      0.86     0.95     0.94     0.87     0.76     0.87     1.12
ZAF      0.88     0.96     0.91     0.91     0.71     0.90     0.94    11.24
NLD      0.92     0.96     0.95     0.89     0.76     0.87     0.91     0.91     5.32


--------------------------------------------------------------------------------
JER     ftl
--------------------------------------------------------------------------------
          AUS      CAN      DFS      GBR      ITA      USA      ZAF      NLD
AUS      6.45
CAN      0.77     5.42
DFS      0.91     0.86    13.83
GBR      0.95     0.85     0.93     1.40
ITA      0.89     0.69     0.87     0.91     1.63
USA      0.93     0.85     0.94     0.95     0.91     1.02
ZAF      0.95     0.82     0.91     0.94     0.90     0.97    11.25
NLD      0.93     0.89     0.96     0.95     0.87     0.95     0.93     4.90


--------------------------------------------------------------------------------
```

```
JER     rtp
--------------------------------------------------------------------------------
         AUS     CAN     DFS     NZL     ZAF     NLD
AUS      5.84
CAN      0.94    6.11
DFS      0.89    0.94   13.01
NZL      0.95    0.95    0.89    0.39
ZAF      0.93    0.97    0.91    0.92   10.53
NLD      0.81    0.86    0.95    0.85    0.79    4.58


--------------------------------------------------------------------------------
JER     ocs
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     ITA     NZL     USA     NLD
AUS      6.06
CAN      0.45    5.89
DFS      0.48    0.66   12.95
GBR      0.67    0.84    0.74    1.93
ITA      0.38    0.80    0.59    0.72    0.76
NZL      0.61    0.61    0.44    0.58    0.58    0.33
USA      0.69    0.78    0.63    0.81    0.68    0.62    0.91
NLD      0.57    0.79    0.85    0.81    0.84    0.60    0.79    2.71


--------------------------------------------------------------------------------
JER     ous
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     NZL     USA     NLD
AUS      5.10
CAN      0.67    6.14
DFS      0.44    0.87   12.66
GBR      0.73    0.86    0.74    1.34
NZL      0.65    0.77    0.73    0.76    0.45
USA      0.66    0.90    0.82    0.86    0.67    0.70
NLD      0.63    0.88    0.86    0.79    0.80    0.90    4.67


--------------------------------------------------------------------------------
JER     ofl
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     ITA     USA     NLD
AUS      6.94
CAN      0.57    5.89
DFS      0.36    0.80   13.76
GBR      0.57    0.75    0.51    1.32
ITA      0.61    0.77    0.59    0.68    1.15
USA      0.67    0.85    0.57    0.74    0.79    0.96
NLD      0.45    0.71    0.60    0.72    0.71    0.67    5.69


--------------------------------------------------------------------------------
RDC     sta
--------------------------------------------------------------------------------
         AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD
AUS     10.96
CAN      0.87    5.93
DEU      0.89    0.95   12.25
DFS      0.87    0.96    0.96    8.78
GBR      0.90    0.91    0.94    0.87    1.19
NOR      0.87    0.90    0.93    0.95    0.88   11.67
NZL      0.89    0.89    0.84    0.88    0.88    0.87    0.47
USA      0.88    0.97    0.94    0.93    0.93    0.87    0.87    2.02
NLD      0.86    0.95    0.97    0.96    0.92    0.93    0.81    0.92    4.29


--------------------------------------------------------------------------------
```

```
RDC     cwi
---------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NZL      USA      NLD
AUS      6.67
CAN      0.67     7.15
DEU      0.69     0.84    11.14
DFS      0.76     0.84     0.88    12.83
GBR      0.78     0.82     0.90     0.82     1.50
NZL      0.79     0.59     0.73     0.71     0.77     0.35
USA      0.53     0.86     0.81     0.77     0.81     0.69     1.08
NLD      0.66     0.89     0.93     0.89     0.91     0.66     0.82     3.70
---------------------------------------------------------------------------------
RDC     bde
---------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      7.94
CAN      0.78     5.97
DEU      0.79     0.88     9.30
DFS      0.84     0.84     0.92    11.75
GBR      0.77     0.81     0.90     0.82     1.41
NOR      0.77     0.65     0.78     0.81     0.63    11.87
NZL      0.80     0.57     0.70     0.79     0.68     0.74     0.35
USA      0.63     0.77     0.86     0.78     0.88     0.64     0.65     1.00
NLD      0.68     0.84     0.91     0.84     0.90     0.64     0.53     0.88     4.16


---------------------------------------------------------------------------------
RDC     ang
---------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      USA      NLD
AUS      8.19
CAN      0.63     6.72
DEU      0.62     0.85    12.07
DFS      0.63     0.81     0.86     9.24
GBR      0.74     0.78     0.81     0.79     1.31
USA      0.71     0.86     0.85     0.79     0.84     0.87
NLD      0.67     0.72     0.48     0.63     0.76     0.66     5.32


---------------------------------------------------------------------------------
RDC     ran
---------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      8.30
CAN      0.90     6.00
DEU      0.89     0.97     8.32
DFS      0.82     0.95     0.95    10.08
GBR      0.94     0.96     0.96     0.94     1.39
NOR      0.68     0.84     0.88     0.90     0.80    10.91
NZL      0.93     0.92     0.89     0.88     0.92     0.80     0.29
USA      0.91     0.98     0.96     0.95     0.95     0.85     0.91     1.06
NLD      0.90     0.96     0.98     0.96     0.97     0.88     0.89     0.96     5.80


---------------------------------------------------------------------------------
RDC     rwi
---------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NZL      USA      NLD
AUS      7.99
CAN      0.85     5.96
DEU      0.84     0.92     8.56
DFS      0.85     0.93     0.91    10.60
GBR      0.84     0.82     0.89     0.78     1.37
NZL      0.87     0.88     0.81     0.89     0.81     0.30
USA      0.77     0.89     0.84     0.86     0.87     0.84     1.19
NLD      0.88     0.94     0.94     0.92     0.89     0.83     0.82     5.75


---------------------------------------------------------------------------------
```

```
RDC     rls
-------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      4.79
CAN      0.65     6.37
DEU      0.73     0.93     8.62
DFS      0.59     0.96     0.92     9.10
GBR      0.83     0.76     0.87     0.74     1.67
NOR      0.47     0.86     0.88     0.93     0.69    13.50
NZL      0.65     0.56     0.67     0.57     0.64     0.58     0.12
USA      0.69     0.94     0.92     0.94     0.80     0.84     0.53     0.70
NLD      0.73     0.91     0.92     0.87     0.87     0.73     0.60     0.89     5.42
-------------------------------------------------------------------------------
RDC     rlr
-------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      NOR      NLD
AUS      5.46
CAN      0.63     6.76
DEU      0.64     0.88     9.54
DFS      0.64     0.86     0.91    10.74
NOR      0.45     0.75     0.81     0.86    12.56
NLD      0.56     0.86     0.89     0.88     0.88     4.72


-------------------------------------------------------------------------------
RDC     fan
-------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NOR      USA      NLD
AUS      6.01
CAN      0.58     6.63
DEU      0.72     0.83    14.23
DFS      0.68     0.62     0.78     9.44
GBR      0.81     0.76     0.89     0.67     1.71
NOR      0.48     0.56     0.76     0.54     0.65    13.76
USA      0.71     0.84     0.83     0.72     0.83     0.61     0.81
NLD      0.71     0.78     0.87     0.71     0.88     0.70     0.80     4.45


-------------------------------------------------------------------------------
RDC     fua
-------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      7.90
CAN      0.74     6.03
DEU      0.77     0.88    10.98
DFS      0.75     0.82     0.82    11.79
GBR      0.76     0.82     0.94     0.81     1.67
NOR      0.71     0.80     0.74     0.86     0.75    11.15
NZL      0.80     0.78     0.80     0.71     0.76     0.74     0.34
USA      0.75     0.93     0.89     0.82     0.89     0.81     0.84     1.13
NLD      0.75     0.91     0.93     0.90     0.92     0.87     0.83     0.88     4.32


-------------------------------------------------------------------------------
RDC     ruh
-------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      8.48
CAN      0.77     5.83
DEU      0.79     0.87    13.39
DFS      0.76     0.90     0.91    10.66
GBR      0.85     0.75     0.87     0.81     1.43
NOR      0.66     0.84     0.83     0.88     0.73    11.71
NZL      0.84     0.75     0.80     0.75     0.88     0.66     0.32
USA      0.79     0.87     0.90     0.91     0.88     0.81     0.84     1.04
NLD      0.78     0.82     0.93     0.93     0.89     0.86     0.82     0.87     5.35


-------------------------------------------------------------------------------
```

```
RDC     usu
---------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD
AUS     7.09
CAN     0.77    5.95
DEU     0.72    0.88    11.59
DFS     0.61    0.79    0.79    12.48
GBR     0.82    0.79    0.75    0.69    1.92
NOR     0.74    0.67    0.70    0.77    0.71    13.65
NZL     0.74    0.66    0.53    0.40    0.65    0.63    0.30
USA     0.79    0.85    0.75    0.83    0.85    0.77    0.69    0.97
NLD     0.79    0.85    0.78    0.89    0.91    0.85    0.56    0.91    4.54


---------------------------------------------------------------------------------
RDC     ude
---------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NOR     USA     NLD
AUS     9.02
CAN     0.92    5.59
DEU     0.94    0.96    11.12
DFS     0.92    0.97    0.95    10.58
GBR     0.92    0.92    0.96    0.89    1.84
NOR     0.85    0.85    0.89    0.91    0.82    10.87
USA     0.94    0.97    0.96    0.96    0.93    0.85    1.10
NLD     0.94    0.96    0.98    0.96    0.96    0.90    0.97    4.62


---------------------------------------------------------------------------------
RDC     ftp
---------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD
AUS     9.43
CAN     0.89    5.18
DEU     0.89    0.95    12.29
DFS     0.84    0.95    0.89    11.83
GBR     0.90    0.89    0.95    0.83    1.54
NOR     0.75    0.83    0.76    0.90    0.73    11.65
NZL     0.92    0.88    0.85    0.76    0.86    0.72    0.26
USA     0.85    0.93    0.92    0.91    0.90    0.83    0.83    1.12
NLD     0.92    0.97    0.97    0.94    0.94    0.84    0.87    0.91    3.72


---------------------------------------------------------------------------------
RDC     ftl
---------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NOR     USA     NLD
AUS     9.68
CAN     0.88    5.19
DEU     0.95    0.91    12.80
DFS     0.93    0.81    0.96    10.48
GBR     0.94    0.86    0.97    0.91    1.53
NOR     0.88    0.80    0.91    0.90    0.89    11.16
USA     0.93    0.89    0.95    0.92    0.94    0.87    1.14
NLD     0.96    0.91    0.98    0.95    0.96    0.92    0.95    4.99


---------------------------------------------------------------------------------
RDC     rtp
---------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     NOR     NZL     NLD
AUS     6.62
CAN     0.87    5.98
DEU     0.90    0.96    13.51
DFS     0.85    0.94    0.96    12.46
NOR     0.60    0.71    0.60    0.43    12.30
NZL     0.90    0.94    0.93    0.90    0.68    0.34
NLD     0.90    0.97    0.97    0.95    0.63    0.93    4.35
---------------------------------------------------------------------------------
```

```
RDC      ocs
--------------------------------------------------------------------------------
         AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      7.08
CAN      0.62     5.76
DEU      0.65     0.82    17.48
DFS      0.59     0.71     0.70     9.37
GBR      0.69     0.77     0.91     0.71     1.66
NOR      0.43     0.49     0.74     0.64     0.52    15.84
NZL      0.72     0.49     0.67     0.69     0.60     0.72     0.29
USA      0.67     0.83     0.88     0.82     0.83     0.69     0.71     0.74
NLD      0.64     0.80     0.87     0.86     0.89     0.64     0.67     0.88     3.15


--------------------------------------------------------------------------------
RDC      ous
--------------------------------------------------------------------------------
         AUS      CAN      DEU      DFS      GBR      NOR      NZL      USA      NLD
AUS      6.80
CAN      0.70     5.82
DEU      0.69     0.87    14.54
DFS      0.53     0.79     0.82    10.97
GBR      0.79     0.81     0.85     0.63     1.52
NOR      0.69     0.80     0.73     0.81     0.71    10.94
NZL      0.76     0.74     0.83     0.76     0.73     0.74     0.36
USA      0.70     0.93     0.89     0.86     0.86     0.80     0.82     0.91
NLD      0.65     0.89     0.91     0.87     0.85     0.83     0.83     0.90     4.76


--------------------------------------------------------------------------------
RDC      ofl
--------------------------------------------------------------------------------
         AUS      CAN      DEU      DFS      GBR      NOR      USA      NLD
AUS      6.01
CAN      0.24     6.17
DEU      0.37     0.84    14.62
DFS      0.36     0.80     0.77    13.11
GBR      0.31     0.70     0.76     0.57     1.59
NOR      0.62     0.62     0.72     0.37     0.55     9.39
USA      0.46     0.71     0.74     0.52     0.71     0.68     1.00
NLD      0.34     0.67     0.72     0.56     0.75     0.74     0.67     6.58
------------------------------------------------------------------------------------------------
---------
^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   97   63   91   34  112   84   17   14
   CHE   82    0  136  376   54  238  435   35   13
   FRA   56  101    0  143   49   85  146   30   11
   ITA   74  325  114    0   70  160  445   51   13
   NLD   26   49   39   50    0   50   67   22    7
   USA  104  212   57  111   36    0  194   18   14
   DEA   67  344  109  362   55  156    0   51   10
   SVN   15   35   29   50   20   15   48    0    5
   GBR   12   11   11   11    7   13    9    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    89    63    90    27   112    82    16    14
  CHE    76     0   121   326    49   208   373    34    12
  FRA    56    87     0   142    45    85   144    29    11
  ITA    74   276   114     0    63   159   415    50    12
  NLD    22    46    36    49     0    36    61    22     7
  USA   104   183    57   111    27     0   176    17    14
  DEA    66   287   108   330    53   131     0    49     9
  SVN    14    33    28    49    20    14    47     0     5
  GBR    12    11    11    11     7    13     9     4     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   DEA   SVN   GBR
------------------------------------------------------------------------------
  CAN     0    90    61    86    27    82    10    14
  CHE    78     0   135   374    53   434    22    13
  FRA    55   101     0   142    45   146    18    11
  ITA    71   322   114     0    64   443    33    13
  NLD    22    49    36    49     0    62    14     7
  DEA    67   344   109   361    54     0    32    10
  SVN     9    21    19    31    13    31     0     4
  GBR    12    11    11    11     7     9     3     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   NLD   USA   GBR
------------------------------------------------------------------------------
  CAN     0    96    63    14   111    14
  CHE    82     0   131    28   236    13
  FRA    56    96     0    27    85    11
  NLD    11    27    22     0    19     3
  USA   103   212    57    14     0    14
  GBR    12    11    11     3    13     0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
------------------------------------------------------------------------------
  CAN     0    97    63    91    34   112    84    17    14
  CHE    82     0   136   376    54   238   435    35    13
  FRA    56   101     0   143    49    85   146    30    11
  ITA    74   325   114     0    70   160   445    51    13
  NLD    26    49    39    50     0    50    67    22     7
  USA   104   212    57   111    36     0   194    18    14
  DEA    67   344   109   362    55   156     0    51    10
  SVN    15    35    29    50    20    15    48     0     5
  GBR    12    11    11    11     7    13     9     4     0
------------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   FRA   NLD   USA   DEA   GBR   SVN
  ------------------------------------------------------------------------------
   CAN     0    97    63    34   112    84    14    10
   CHE    82     0   135    53   237   430    13    22
   FRA    56   100     0    49    85   146    11    18
   NLD    26    48    39     0    50    67     7    14
   USA   104   212    57    36     0   194    14    10
   DEA    67   343   108    55   156     0    10    32
   GBR    12    11    11     7    13     9     0     4
   SVN     9    21    19    13     9    31     3     0
  ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
  ------------------------------------------------------------------------------
   CAN     0    97    63    91    34   112    84    17    14
   CHE    82     0   136   376    54   238   435    35    13
   FRA    56   101     0   143    49    85   146    30    11
   ITA    74   325   114     0    70   160   445    51    13
   NLD    26    49    39    50     0    50    67    22     7
   USA   104   212    57   111    36     0   194    18    14
   DEA    67   344   109   362    55   156     0    51    10
   SVN    15    35    29    50    20    15    48     0     5
   GBR    12    11    11    11     7    13     9     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    97    63    91    26   112    84    17    14
   CHE    82     0   136   376    52   238   435    35    13
   FRA    56   101     0   143    45    85   146    30    11
   ITA    74   325   114     0    63   160   445    51    13
   NLD    21    48    36    48     0    35    61    22     7
   USA   104   212    57   111    25     0   194    18    14
   DEA    67   344   109   362    53   156     0    51    10
   SVN    15    35    29    50    20    15    48     0     5
   GBR    12    11    11    11     7    13     9     4     0
  ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   FRA   ITA   NLD   DEA   SVN
  ------------------------------------------------------------------------------
   CAN     0    88    60    83    26    81    17
   CHE    75     0   133   363    51   429    35
   FRA    54    99     0   139    45   145    30
   ITA    70   312   114     0    62   438    51
   NLD    21    47    36    48     0    61    22
   DEA    66   339   108   358    53     0    51
   SVN    15    34    29    50    20    48     0
  ------------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
 ------------------------------------------------------------------------
  CAN     0    97    63    90    26   112    50    10    14
  CHE    82     0   136   371    53   238   237    22    13
  FRA    56   101     0   142    45    85    93    18    11
  ITA    74   322   114     0    61   156   205    33    12
  NLD    21    49    36    49     0    35    48    14     7
  USA   104   212    57   111    26     0    94    10    14
  DEA    40   175    63   172    42    64     0    30     7
  SVN     9    21    19    31    13     9    29     0     4
  GBR    12    11    11    11     7    13     7     3     0
 ------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
 ------------------------------------------------------------------------
  CAN     0    97    63    91    27   112    84    17    14
  CHE    82     0   136   376    53   238   435    35    13
  FRA    56   101     0   143    45    85   146    30    11
  ITA    74   325   114     0    64   160   445    51    13
  NLD    22    49    36    49     0    36    62    22     7
  USA   104   212    57   111    27     0   194    18    14
  DEA    67   344   109   362    54   156     0    51    10
  SVN    15    35    29    50    20    15    48     0     5
  GBR    12    11    11    11     7    13     9     4     0
 ------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN
 ------------------------------------------------------------------------
  CAN     0    97    63    91    27   112    84    17
  CHE    82     0   136   376    53   238   435    35
  FRA    56   101     0   143    45    85   146    30
  ITA    74   325   114     0    64   160   445    51
  NLD    22    49    36    49     0    36    62    22
  USA   104   212    57   111    27     0   194    18
  DEA    67   344   109   362    54   156     0    51
  SVN    15    35    29    50    20    15    48     0
 ------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
 ------------------------------------------------------------------------
  CAN     0    97    63    91    34   112    84    10    14
  CHE    82     0   136   376    54   238   435    22    13
  FRA    56   101     0   143    49    85   146    18    11
  ITA    74   325   114     0    70   160   445    33    13
  NLD    26    49    39    50     0    50    67    14     7
  USA   104   212    57   111    36     0   194    10    14
  DEA    67   344   109   362    55   156     0    32    10
  SVN     9    21    19    31    13     9    31     0     4
  GBR    12    11    11    11     7    13     9     3     0
 ------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
 ------------------------------------------------------------------------------
  CAN     0    97    63    91    34   110    84    17    14
  CHE    82     0   136   376    54   238   435    35    13
  FRA    56   101     0   143    49    85   146    30    11
  ITA    74   325   114     0    70   160   445    51    13
  NLD    26    49    39    50     0    50    67    22     7
  USA   103   212    57   111    36     0   194    18    14
  DEA    67   344   109   362    55   156     0    51    10
  SVN    15    35    29    50    20    15    48     0     5
  GBR    12    11    11    11     7    13     9     4     0
 ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   NLD   USA   DEA   SVN   GBR
 ------------------------------------------------------------------------------
  CAN     0    97    63    34   112    73    16    14
  CHE    82     0   135    53   237   399    34    13
  FRA    56   100     0    49    85   136    29    11
  NLD    26    48    39     0    50    61    22     7
  USA   104   212    57    36     0   169    16    14
  DEA    59   312   100    53   128     0    49     9
  SVN    14    34    28    20    14    47     0     5
  GBR    12    11    11     7    13     9     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    97    63    91    34   112    84    16    14
  CHE    82     0   136   376    54   238   435    34    13
  FRA    56   101     0   143    49    85   146    29    11
  ITA    74   325   114     0    70   160   445    50    13
  NLD    26    49    39    50     0    50    67    22     7
  USA   104   212    57   111    36     0   194    17    14
  DEA    67   344   109   362    55   156     0    50    10
  SVN    14    34    28    49    20    14    47     0     5
  GBR    12    11    11    11     7    13     9     4     0
 ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   DEA   SVN
 ------------------------------------------------------------------------------
  CAN     0    88    60    83    22    48    16
  CHE    76     0   134   360    49   235    34
  FRA    54   100     0   139    42    92    29
  ITA    70   312   114     0    57   204    50
  NLD    18    47    34    47     0    48    21
  DEA    39   174    62   172    42     0    41
  SVN    14    34    28    49    20    38     0
 ------------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
-------------------------------------------------------------------------------
  CAN     0    89    53    90    34   112    50    10    14
  CHE    76     0    98   324    48   208   233    22    12
  FRA    50    74     0   109    39    69    83    18    11
  ITA    74   274    92     0    67   156   205    33    12
  NLD    26    46    34    50     0    50    48    14     7
  USA   104   183    49   111    36     0    94    10    14
  DEA    40   171    61   172    42    64     0    30     7
  SVN     9    21    19    31    13     9    29     0     4
  GBR    12    11    11    11     7    13     7     3     0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
-------------------------------------------------------------------------------
  CAN     0    89    53    91    34   111    84    10    14
  CHE    76     0    99   326    49   208   384    22    12
  FRA    50    74     0   110    39    69   115    18    11
  ITA    74   276    92     0    70   160   439    33    13
  NLD    26    46    34    50     0    50    67    14     7
  USA   103   183    49   111    36     0   192    10    14
  DEA    66   298    87   359    55   152     0    32    10
  SVN     9    21    19    31    13     9    31     0     4
  GBR    12    11    11    11     7    13     9     3     0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
-------------------------------------------------------------------------------
  CAN     0    89    53    89    34   112    84    10    14
  CHE    76     0    99   323    49   208   384    22    12
  FRA    50    74     0   108    39    69   115    18    11
  ITA    74   275    92     0    67   156   435    33    12
  NLD    26    46    34    50     0    50    67    14     7
  USA   104   183    49   108    36     0   192    10    14
  DEA    66   298    87   356    55   152     0    32    10
  SVN     9    21    19    31    13     9    31     0     4
  GBR    12    11    11    11     7    13     9     3     0
-------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   GBR   USA   AUS
-------------------------------------------------------------------------------
  CAN     0    20    54    21
  GBR    17     0    61    12
  USA    43    61     0    26
  AUS    20     9    21     0
-------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   GBR   USA   AUS
-------------------------------------------------------------------------------
  CAN     0    20    54    21
  GBR    17     0    61    12
  USA    43    61     0    26
  AUS    20     9    21     0
-------------------------------------------------------------------------------
```

```
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 ------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 ------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 ------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 ------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 ------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 ------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 ------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 ------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 ------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 ------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  USA  AUS
 ------------------------------------------------------------------------------
   CAN    0   26    7
   USA   24    0    8
   AUS    6    7    0
 ------------------------------------------------------------------------------
```

```
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 -------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 -------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 -------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 -------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   20   52   20
   GBR   17    0   61   12
   USA   42   61    0   26
   AUS   19    9   21    0
 -------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
 -------------------------------------------------------------------------------
   CAN    0   20   54   21
   GBR   17    0   61   12
   USA   43   61    0   26
   AUS   20    9   21    0
 -------------------------------------------------------------------------------
```

```
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
--------------------------------------------------------------------------------
  CAN    0   20   54   21
  GBR   17    0   61   12
  USA   43   61    0   26
  AUS   20    9   21    0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  AUS
--------------------------------------------------------------------------------
  CAN    0    7
  AUS    6    0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
--------------------------------------------------------------------------------
  CAN    0   12   54   21
  GBR    9    0   33   10
  USA   43   31    0   26
  AUS   20    7   21    0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
--------------------------------------------------------------------------------
  CAN    0   18   52   20
  GBR   15    0   59   12
  USA   42   59    0   26
  AUS   19    9   21    0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
--------------------------------------------------------------------------------
  CAN    0   18   54   21
  GBR   15    0   59   12
  USA   43   59    0   26
  AUS   20    9   21    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 FRR IRL KOR SVN PRT
 ----------------------------------------------------------------------------
 AUS    0  317  650  305  661  598  453  630  664  628  696  821  354  391  429  251  425  420
 48    8  320  209   73  417
 BEL  230    0  381  322  544  438  370  486  462  482  670  474  264  334  204  178  267  343
 37   36  268  146   86  376
 CAN  508  342    0  545 1477  866  938  974 1091 1241  915 2149  618  706  305  318  915  782
 81   12  334  437   95  684
 CHE  223  298  386    0  671  401  370  384  451  500  566  600  265  323  187  166  273  344
 30   33  252  147   69  330
 DEU  250  389  395  395    0 1666 1056 1680 1346 1981 1928 2220  775 1138  385  326  972 1304
119  110  464  358  146  808
 DFS  307  357  506  325  583    0  735 1202 1087 1216 1320 1367  579  832  399  332  651  887
 88   26  451  311  128  709
 ESP  287  329  477  283  437  456    0  818  813 1000  792 1131  517  618  261  309  643  658
 72   13  332  309  101  648
 FRA  299  427  463  313  476  414  486    0 1156 1426 1457 1919  616  943  427  307  905  929
 83   16  437  326   96  665
 GBR  466  424 1006  425  564  656  624  558    0 1264 1285 1530  598  766  409  342  703  806
 84   20  578  344  123  735
 ITA  358  405  750  408  848  740  667  540  890    0 1357 2041  732  962  402  350  896 1037
 99   31  439  426  140  832
 NLD  477  693  687  520  879  856  620  627  962  941    0 1746  625  929  520  335  720 1053
117   87  541  311  139  815
 USA  561  369 1824  493  627  700  637  757 1205 1119 1229    0  851 1074  475  404 1410 1190
120   22  440  573  121  911
 HUN  211  215  506  205  423  385  387  332  464  550  445  716    0  514  229  251  455  655
 61    4  270  289   79  481
 POL  189  249  417  220  505  470  357  375  486  600  608  720  366    0  251  234  526  776
 96   70  306  305  115  606
 NZL  304  146  245  151  194  230  204  186  301  276  445  382  174  137    0  187  265  278
 27    5  280  129   40  288
 ZAF  212  152  293  150  224  256  287  212  316  300  298  426  218  165  165    0  258  256
 32    5  205  183   50  303
 JPN  169  141  245  132  172  208  200  171  227  236  211  294  173  147  105  155    0  591
 59    3  257  335   75  459
 CZE  207  238  464  227  709  457  416  485  514  650  812  783  546  478  169  190  147    0
 77   26  318  331  120  585
 EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   11   15   13   36
  0    1   41   33   21   65
 FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    5    4    3   22
  0    0    9    1   13   19
 IRL  267  256  308  249  307  347  317  327  628  387  485  398  229  215  227  196  137  239
 20    9    0  148   64  345
 KOR  126   82  377   94  150  182  203  139  245  333  181  619  227  204   80  144  133  226
 13    0   97    0   54  319
 SVN   45   72   70   51  117  105   73   65   96  121  115   98   61   91   30   37   38   91
 16   12   50   30    0   96
 PRT  270  360  675  291  554  596  662  568  682  784  815  883  456  548  209  288  189  498
 42   18  313  260   79    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  FRR  IRL  KOR  SVN  PRT
 ----------------------------------------------------------------------------
  AUS    0  311  650  305  661  597  468  500  664  628  643  821  354  389  429  204  425  420
 48    8  324  207   73  417
  BEL  230    0  376  320  539  433  376  440  456  478  622  460  262  331  201  159  261  342
 37   33  272  144   86  373
  CAN  508  342    0  545 1476  866  948  802 1091 1241  840 2149  618  705  305  267  915  782
 81   10  339  434   95  684
  CHE  223  297  386    0  671  401  378  349  451  500  545  600  265  322  187  147  273  344
 30   28  258  146   69  330
  DEU  250  389  395  395    0 1666 1088 1535 1345 1981 1837 2220  775 1135  385  281  972 1304
119   94  473  354  146  808
  DFS  307  357  506  325  583    0  760 1026 1085 1215 1242 1366  578  828  398  279  651  887
 88   23  452  308  128  708
  ESP  298  346  484  293  486  484    0  749  837 1034  786 1157  527  637  273  266  654  672
 75   11  351  309  105  680
  FRA  261  403  405  285  392  389  491    0 1001 1292 1146 1480  564  877  336  223  740  880
 78   13  386  287   95  593
  GBR  466  424 1006  425  564  656  659  508    0 1264 1220 1529  598  764  409  285  703  806
 84   17  583  342  123  734
  ITA  358  405  750  408  848  740  724  486  890    0 1302 2041  732  962  402  305  896 1037
 99   29  447  422  140  832
  NLD  449  644  630  500  840  832  628  514  909  900    0 1508  604  906  493  272  651 1036
114   70  534  291  139  784
  USA  561  369 1824  493  627  699  660  557 1205 1119  987    0  851 1072  475  337 1410 1190
120   20  445  567  121  911
  HUN  211  215  506  205  423  385  396  317  464  550  428  716    0  513  229  225  455  655
 61    4  272  286   79  481
  POL  189  249  417  220  505  470  379  360  485  600  597  720  366    0  251  209  525  776
 96   63  310  303  115  605
  NZL  304  146  245  151  194  230  213  157  301  276  424  382  174  137    0  151  265  278
 27    3  281  127   40  288
  ZAF  181  141  253  136  200  232  251  173  268  270  240  344  203  158  131    0  215  236
 31    5  168  163   50  266
  JPN  169  141  245  132  172  208  204  166  227  236  209  294  173  147  105  149    0  591
 59    3  260  334   75  459
  CZE  207  238  464  227  709  457  435  454  514  650  795  783  546  478  169  178  147    0
 77   25  323  330  120  585
  EST   15   26   30   12   49   39   29   23   31   43   65   68   33   47   11   15   13   36
  0    1   41   32   21   65
  FRR    6   30    8   24   73   23    8   12   14   27   48   13    4   63    3    4    3   21
  0    0    9    1   12   18
  IRL  272  262  314  256  312  351  340  304  637  395  480  407  230  219  227  167  138  242
 20    9    0  146   64  346
  KOR  126   82  375   94  150  182  204  132  245  333  172  612  226  204   80  130  133  226
 13    0   98    0   54  316
  SVN   45   72   70   51  117  105   80   65   96  121  113   98   61   91   30   37   38   91
 16   11   50   30    0   96
  PRT  270  360  675  291  554  596  715  535  682  784  783  883  456  548  209  262  189  498
 42   17  314  259   79    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  FRR  IRL  KOR  PRT  SVN
 ----------------------------------------------------------------------------
  AUS    0  316  642  304  659  593  447  622  658  627  671  813  354  389  422  251  424  419
48    8  322  208  414   48
  BEL  230    0  381  322  544  437  371  486  462  482  648  474  264  334  204  178  267  343
37   36  273  145  376   57
  CAN  507  342    0  545 1477  866  940  974 1091 1241  884 2149  618  706  305  318  915  782
81   12  339  435  684   70
  CHE  223  298  386    0  671  401  371  384  451  500  558  600  265  323  187  166  273  344
30   33  258  146  330   48
  DEU  250  389  395  395    0 1666 1060 1680 1346 1981 1887 2220  775 1138  385  326  972 1304
119  110  473  355  808  112
  DFS  307  357  506  325  583    0  737 1201 1086 1215 1279 1366  578  831  398  332  651  887
88   26  453  309  708   96
  ESP  289  331  477  285  442  459    0  819  816 1005  781 1134  518  620  261  309  645  658
72   13  337  307  652   73
  FRA  299  427  463  313  476  414  488    0 1156 1426 1344 1919  616  943  427  307  905  929
83   16  442  324  665   72
  GBR  465  424 1006  425  564  656  628  558    0 1264 1258 1530  598  766  409  342  703  806
84   20  584  343  735   90
  ITA  358  405  750  408  848  740  673  540  890    0 1335 2041  732  962  402  350  896 1037
99   31  447  424  832  106
  NLD  474  669  680  519  871  855  622  604  951  940    0 1619  616  920  507  325  687 1049
116   84  541  304  805  100
  USA  559  369 1824  493  627  699  640  757 1205 1119 1192    0  851 1074  475  404 1410 1190
120   22  446  569  911   89
  HUN  211  215  506  205  423  385  388  332  464  550  445  716    0  514  229  251  455  655
61    4  272  288  481   62
  POL  189  249  417  220  505  470  359  375  486  600  607  720  366    0  251  234  526  776
96   70  310  304  606   90
  NZL  303  146  245  151  194  230  205  186  301  276  443  382  174  137    0  187  265  278
27    5  281  128  288   30
  ZAF  212  152  293  150  224  256  287  212  316  300  296  426  218  165  165    0  258  256
32    5  205  182  303   32
  JPN  169  141  245  132  172  208  201  171  227  236  211  294  173  147  105  155    0  591
59    3  260  334  459   52
  CZE  207  238  464  227  709  457  416  485  514  650  812  783  546  478  169  190  147    0
77   26  323  331  585   92
  EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   11   15   13   36
 0    1   41   33   65   17
  FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    5    4    3   22
 0    0    9    1   19    8
  IRL  272  262  314  256  312  351  320  331  637  395  491  407  230  219  227  196  138  242
20    9    0  148  346   43
  KOR  126   82  376   94  150  182  203  139  245  333  179  615  227  204   80  143  133  226
13    0   98    0  318   41
  PRT  270  360  675  291  554  596  668  568  682  784  808  883  456  548  209  288  189  498
42   18  314  260    0   68
  SVN   30   49   53   38   91   79   52   49   70   90   82   75   47   71   23   24   23   71
12    8   37   23   56    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  ZAF  JPN  CZE  EST
FRR  IRL  KOR  PRT  SVN
 ----------------------------------------------------------------------------
  AUS    0  305  650  295  660  596  464  500  661  628  296  819  353  387  250  425  418   46
8  322  207  417   47
  BEL  230    0  370  301  530  426  367  437  447  471  340  450  255  325  172  256  333   37
34  267  139  367   56
  CAN  508  340    0  511 1475  862  945  802 1089 1240  458 2149  618  705  317  915  781   80
12  338  434  684   70
  CHE  223  282  359    0  578  396  370  347  443  477  311  555  259  303  166  272  328   29
21  257  144  321   48
  DEU  250  387  395  338    0 1654 1078 1534 1343 1980  914 2217  772 1133  325  971 1300  118
110  472  354  807  111
  DFS  307  356  506  320  583    0  751 1022 1075 1209  620 1357  574  819  331  648  881   86
26  451  308  706   95
  ESP  294  340  482  290  473  476    0  742  830 1024  424 1151  523  629  314  651  665   73
13  346  309  673   73
  FRA  261  403  405  283  392  389  477    0 1000 1292  560 1479  563  876  254  740  880   76
14  385  287  593   72
  GBR  466  421 1006  420  563  656  653  508    0 1261  578 1522  594  757  339  702  800   81
20  576  342  732   89
  ITA  358  405  750  392  847  740  707  486  888    0  676 2038  730  959  348  896 1034   97
31  445  422  832  105
  NLD  233  340  390  270  463  522  334  327  485  530    0  650  320  556  160  280  629   76
41  261  155  399   91
  USA  561  365 1824  450  627  699  656  557 1204 1118  474    0  849 1071  402 1410 1185  119
22  442  566  910   89
  HUN  211  214  506  201  423  385  394  317  463  549  233  715    0  512  251  455  653   61
4  269  286  479   62
  POL  189  248  417  201  505  468  373  360  483  600  427  719  366    0  232  525  770   95
70  307  303  604   89
  ZAF  212  152  293  150  224  256  292  182  316  300  139  425  218  165    0  258  253   31
5  203  181  302   32
  JPN  169  141  245  132  172  208  204  166  227  236  138  294  173  147  155    0  591   59
3  259  334  459   52
  CZE  207  237  464  219  709  457  430  454  512  650  565  782  546  476  190  147    0   73
26  320  330  583   91
  EST   15   26   30   12   49   39   28   23   31   43   47   68   33   47   15   13   35    0
1   39   32   64   16
  FRR    6   31    8   17   84   26    8   12   16   29   30   13    4   75    4    3   22    0
0    9    1   19    8
  IRL  272  262  314  255  311  351  334  304  631  395  262  407  230  218  196  138  242   20
9    0  146  345   43
  KOR  126   82  375   93  150  182  204  132  245  333   99  611  226  204  143  133  226   13
0   98    0  316   41
  PRT  270  359  675  284  554  596  701  535  682  784  389  883  456  548  288  189  498   42
18  314  259    0   67
  SVN   30   49   53   38   91   79   55   49   70   90   81   75   47   71   24   23   70   12
8   37   23   56    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  FRR  IRL KOR SVN PRT
 --------------------------------------------------------------------------
  AUS    0 317 650 305 661 598 453 630 664 628 696 821 354 391 429 251 425 420
48   8 324 209  73 417
  BEL  230   0 381 322 544 438 369 486 462 482 670 474 264 334 204 178 267 343
37  36 273 146  86 376
  CAN  508 342   0 545 1477 866 937 974 1091 1241 915 2149 618 706 305 318 915 782
81  12 339 437  95 684
  CHE  223 298 386   0 671 401 370 384 451 500 566 600 265 323 187 166 273 344
30  33 258 147  69 330
  DEU  250 389 395 395   0 1666 1055 1680 1346 1981 1928 2220 775 1138 385 326 972 1304
119 110 473 359 146 808
  DFS  306 356 506 325 583   0 733 1202 1087 1216 1320 1367 579 832 399 332 651 887
88  26 454 311 128 709
  ESP  287 329 476 283 437 453   0 816 811 998 792 1129 516 618 261 309 642 657
72  13 335 309 101 648
  FRA  299 427 463 313 476 411 484   0 1156 1426 1457 1919 616 943 427 307 905 929
83  16 442 327  96 665
  GBR  466 424 1006 425 564 654 623 558   0 1264 1285 1530 598 766 409 342 703 806
84  20 585 344 123 735
  ITA  358 405 750 408 848 739 666 540 890   0 1357 2041 732 962 402 350 896 1037
99  31 447 426 140 832
  NLD  477 693 687 520 879 856 620 627 962 941   0 1746 625 929 520 335 720 1053
117  87 548 311 139 815
  USA  561 369 1824 493 627 699 636 757 1205 1119 1229   0 851 1074 475 404 1410 1190
120  22 447 574 121 911
  HUN  211 215 506 205 423 383 387 332 464 550 445 716   0 514 229 251 455 655
61   4 272 289  79 481
  POL  189 249 417 220 505 470 357 375 486 600 608 720 366   0 251 234 526 776
96  70 310 306 115 606
  NZL  304 146 245 151 194 230 204 186 301 276 445 382 174 137   0 187 265 278
27   5 281 129  40 288
  ZAF  212 152 293 150 224 256 287 212 316 300 298 426 218 165 165   0 258 256
32   5 205 183  50 303
  JPN  169 141 245 132 172 208 200 171 227 236 211 294 173 147 105 155   0 591
59   3 260 336  75 459
  CZE  207 238 464 227 709 455 415 485 514 650 812 783 546 478 169 190 147   0
77  26 323 331 120 585
  EST   15  26  30  12  49  39  27  23  31  43  66  68  33  47  11  15  13  36
0   1  41  33  21  65
  FRR    6  32   8  25  84  26   8  12  16  29  53  13   4  75   5   4   3  22
0   0   9   1  13  19
  IRL  272 262 314 256 312 350 319 331 638 395 494 407 230 219 227 196 138 242
20   9   0 149  64 346
  KOR  126  82 377  94 150 182 202 139 245 333 181 620 227 204  80 144 133 226
13   0  98   0  54 319
  SVN   45  72  70  51 117 105  73  65  96 121 115  98  61  91  30  37  38  91
16  12  50  30   0  96
  PRT  270 360 675 291 554 594 662 568 682 784 815 883 456 548 209 288 189 498
42  18 314 260  79   0
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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  FRR  IRL  KOR  PRT  SVN
 ---------------------------------------------------------------------------
  AUS    0  292  650  305  661  598  453  630  664  628  694  821  354  391  429  251  235  420
48    8  324  207  417   48
  BEL  229    0  364  315  521  417  353  448  440  463  590  433  249  321  189  166  175  328
37   34  264  136  357   57
  CAN  508  337    0  545 1477  866  937  974 1091 1241  912 2149  618  706  305  318  613  782
81   12  339  434  684   70
  CHE  223  296  386    0  671  401  370  384  451  500  564  600  265  323  187  166  201  344
30   33  258  145  330   48
  DEU  250  386  395  395    0 1666 1055 1680 1346 1981 1923 2220  775 1138  385  326  694 1304
119  110  473  354  808  112
  DFS  307  355  506  325  583    0  733 1202 1087 1216 1312 1367  579  832  399  332  423  887
88   26  454  308  709   96
  ESP  287  328  476  283  437  455    0  816  811  998  789 1129  516  618  261  309  463  657
72   13  335  305  648   73
  FRA  299  422  463  313  476  414  484    0 1156 1426 1445 1919  616  943  427  307  572  929
83   16  442  323  665   72
  GBR  466  419 1006  425  564  656  623  558    0 1264 1283 1530  598  766  409  342  462  806
84   20  585  342  735   90
  ITA  358  403  750  408  848  740  666  540  890    0 1356 2041  732  962  402  350  657 1037
99   31  447  423  832  106
  NLD  477  613  687  520  878  856  619  627  961  941    0 1739  625  928  519  335  475 1053
116   87  547  306  814  100
  USA  561  360 1824  493  627  699  636  757 1205 1119 1226    0  851 1074  475  404  891 1190
120   22  447  567  911   89
  HUN  211  213  506  205  423  385  387  332  464  550  445  716    0  514  229  251  337  655
61    4  272  287  481   62
  POL  189  248  417  220  505  470  357  375  486  600  608  720  366    0  251  234  424  776
96   70  310  303  606   90
  NZL  304  143  245  151  194  230  204  186  301  276  445  382  174  137    0  187  151  278
27    5  281  127  288   30
  ZAF  212  150  293  150  224  256  287  212  316  300  298  426  218  165  165    0  160  256
32    5  205  181  303   32
  JPN  133  113  202  113  144  176  157  142  181  201  169  237  142  136   80  110    0  450
47    2  176  248  303   49
  CZE  207  237  464  227  709  457  415  485  514  650  812  783  546  478  169  190  129    0
77   26  323  330  585   92
  EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   11   15   13   36
0    1   41   33   65   17
  FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    5    4    2   22
0    0    9    1   19    8
  IRL  272  260  314  256  312  351  319  331  638  395  494  407  230  219  227  196  114  242
20    9    0  147  346   43
  KOR  126   82  377   94  150  182  202  139  245  333  181  615  227  204   80  144  116  226
13    0   98    0  317   41
  PRT  270  354  675  291  554  596  662  568  682  784  814  883  456  548  209  288  150  498
42   18  314  260    0   68
  SVN   30   49   53   38   91   79   52   49   70   90   82   75   47   71   23   24   23   71
12    8   37   23   56    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  FRR  IRL  KOR  SVN  PRT
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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT
AUS	0	317	650	305	661	598	462	630	664	628	696	821	354	391	429	251	425	420	48	8	324	207	73	417
BEL	230	0	381	322	544	438	374	486	462	482	670	474	264	334	204	178	267	343	37	35	273	144	86	376
CAN	508	342	0	545	1477	866	944	974	1091	1241	915	2149	618	706	305	318	915	782	81	12	339	434	95	684
CHE	223	298	386	0	671	401	375	384	451	500	566	600	265	323	187	166	273	344	30	32	258	146	69	330
DEU	250	389	395	395	0	1666	1073	1680	1346	1981	1928	2220	775	1138	385	326	972	1304	119	109	473	354	146	808
DFS	307	357	506	325	583	0	749	1202	1087	1216	1320	1367	579	832	399	332	651	887	88	25	454	308	128	709
ESP	291	335	480	289	460	469	0	835	829	1020	811	1147	522	630	270	313	649	666	73	13	345	308	102	665
FRA	299	427	463	313	476	414	510	0	1156	1426	1457	1919	616	943	427	307	905	929	83	16	442	322	96	665
GBR	466	424	1006	425	564	656	642	558	0	1264	1285	1530	598	766	409	342	703	806	84	19	585	342	123	735
ITA	358	405	750	408	848	740	694	540	890	0	1357	2041	732	962	402	350	896	1037	99	30	447	422	140	832
NLD	477	693	687	520	879	856	640	627	962	941	0	1746	625	929	520	335	720	1053	117	86	548	306	139	815
USA	561	369	1824	493	627	700	650	757	1205	1119	1229	0	851	1074	475	404	1410	1190	120	22	447	566	121	911
HUN	211	215	506	205	423	385	391	332	464	550	445	716	0	514	229	251	455	655	61	4	272	286	79	481
POL	189	249	417	220	505	470	365	375	486	600	608	720	366	0	251	234	526	776	96	69	310	303	115	606
NZL	304	146	245	151	194	230	209	186	301	276	445	382	174	137	0	187	265	278	27	4	281	127	40	288
ZAF	212	152	293	150	224	256	291	212	316	300	298	426	218	165	165	0	258	256	32	5	205	181	50	303
JPN	169	141	245	132	172	208	203	171	227	236	211	294	173	147	105	155	0	591	59	3	260	334	75	459
CZE	207	238	464	227	709	457	424	485	514	650	812	783	546	478	169	190	147	0	77	25	323	330	120	585
EST	15	26	30	12	49	39	27	23	31	43	66	68	33	47	11	15	13	36	0	1	41	32	21	65
FRR	6	31	8	24	83	25	8	12	15	28	52	13	4	74	4	4	3	21	0	0	9	1	12	19
IRL	272	262	314	256	312	351	329	331	638	395	494	407	230	219	227	196	138	242	20	9	0	146	64	346
KOR	126	82	375	94	150	182	203	138	245	332	180	611	226	204	80	143	133	226	13	0	98	0	54	315
SVN	45	72	70	51	117	105	75	65	96	121	115	98	61	91	30	37	38	91	16	11	50	30	0	96
PRT	270	360	675	291	554	596	688	568	682	784	815	883	456	548	209	288	189	498	42	18	314	259	79	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 ZAF JPN CZE EST
FRR  IRL  KOR  SVN  PRT
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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT
AUS	0	255	467	267	515	455	370	335	520	482	492	547	287	300	183	302	274	41	8	274	120	69	341
BEL	219	0	344	311	501	401	350	360	422	447	552	412	245	296	147	230	266	36	31	250	96	83	345
CAN	397	332	0	512	1396	772	876	650	996	1187	775	1955	597	654	256	791	648	76	10	311	332	92	643
CHE	212	292	371	0	671	400	377	304	451	500	536	600	265	299	147	266	273	30	29	250	102	67	323
DEU	234	373	391	395	0	1665	1080	1262	1344	1981	1793	2220	774	1086	281	936	1073	119	97	455	275	143	799
DFS	293	349	503	325	583	0	748	805	1081	1211	1204	1365	576	779	279	607	701	88	24	428	223	127	696
ESP	273	335	470	293	481	480	0	623	826	1028	759	1148	525	599	266	615	562	75	12	333	229	105	665
FRA	201	329	333	245	318	326	411	0	785	1060	925	1133	481	775	180	587	696	66	10	303	208	86	485
GBR	413	407	933	425	564	654	655	403	0	1263	1169	1522	597	721	285	655	652	83	17	541	255	120	723
ITA	327	397	741	408	848	739	718	412	888	0	1277	2039	731	927	305	858	880	99	30	431	334	137	826
NLD	387	572	610	495	826	827	612	440	884	892	0	1414	588	855	267	617	885	113	74	485	221	136	762
USA	443	355	1711	493	627	699	657	422	1204	1119	956	0	850	1023	337	1281	982	120	20	419	435	118	900
HUN	201	209	500	205	423	385	395	272	464	550	431	716	0	489	225	440	539	61	4	261	232	78	478
POL	174	236	396	207	484	446	349	322	464	586	573	690	349	0	194	491	674	94	69	274	256	112	567
ZAF	176	138	250	136	200	232	251	137	268	270	238	344	203	149	0	206	194	31	5	164	117	49	264
JPN	163	140	241	132	171	206	199	145	224	233	206	289	171	141	148	0	481	57	3	233	248	75	433
CZE	155	193	386	177	580	377	330	338	402	543	701	631	437	422	141	133	0	69	24	246	260	111	475
EST	15	26	30	12	49	39	29	19	31	43	65	68	33	46	15	13	31	0	1	39	27	21	64
FRR	6	29	8	24	75	24	8	8	14	28	49	13	4	74	4	3	20	0	0	9	1	10	18
IRL	253	253	311	254	310	349	335	244	605	392	464	401	228	205	166	137	187	20	9	0	92	63	332
KOR	73	63	288	70	116	139	140	113	172	261	126	461	178	183	86	102	183	11	0	64	0	46	240
SVN	45	70	69	50	115	105	79	59	95	119	112	97	60	90	37	38	87	16	10	50	28	0	96
PRT	252	345	639	285	544	583	694	464	669	776	764	866	452	519	260	184	394	41	17	307	198	79	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  ZAF  JPN  CZE  EST
FRR  IRL  KOR  SVN  PRT
 ---------------------------------------------------------------------------
  AUS    0  289  642  304  360  592  458  621  658  625  661  813  352  387  251  424  417   46
8  321  208   71  414
  BEL  229    0  361  314  370  414  358  445  439  458  583  431  248  319  166  245  326   36
34  263  137   85  357
  CAN  507  337    0  544 1006  865  946  959 1091 1238  868 2149  615  701  318  915  776   79
12  339  434   93  684
  CHE  223  296  386    0  454  400  377  381  450  496  555  599  264  321  166  272  342   30
33  258  145   68  330
  DEU  176  288  300  280    0  967  769 1014  837 1379 1186 1378  520  830  185  611  896   89
47  286  249  123  507
  DFS  307  354  506  325  416    0  755 1173 1084 1207 1264 1363  574  826  332  651  879   86
26  453  309  126  707
  ESP  295  340  483  293  318  477    0  828  833 1023  792 1153  522  630  314  651  667   73
13  347  310  102  674
  FRA  299  422  463  313  287  413  520    0 1141 1415 1301 1880  612  934  306  892  922   82
15  436  319   95  662
  GBR  465  419 1006  425  382  656  654  558    0 1262 1240 1528  596  761  341  703  800   83
20  580  343  122  734
  ITA  358  400  750  407  575  738  708  539  889    0 1318 2039  727  953  349  893 1030   96
31  445  422  138  831
  NLD  470  611  674  517  566  852  644  590  942  933    0 1574  607  904  323  679 1038  114
80  534  300  137  797
  USA  559  360 1824  493  407  699  657  722 1205 1119 1176    0  848 1067  404 1410 1185  119
21  445  565  119  911
  HUN  211  212  506  205  290  382  395  332  464  548  442  716    0  511  250  454  651   59
4  271  287   77  480
  POL  189  247  417  219  402  467  374  375  484  597  599  720  364    0  233  523  769   93
69  308  303  112  603
  ZAF  212  150  293  150  133  256  292  212  316  300  292  426  218  165    0  258  255   32
5  205  182   50  303
  JPN  169  141  245  132  134  208  204  171  227  236  210  294  173  147  155    0  588   58
3  260  334   73  459
  CZE  207  235  464  226  510  456  431  485  513  647  809  783  544  475  190  147    0   74
26  322  330  118  583
  EST   15   25   30   12   35   38   29   23   30   42   65   68   32   45   15   13   34    0
1   40   33   20   65
  FRR    6   32    8   25   35   26    8   12   16   29   51   13    4   75    4    3   22    0
0    9    1   13   19
  IRL  272  260  314  256  211  351  334  331  633  395  490  407  230  219  196  138  242   20
9    0  147   63  346
  KOR  126   82  375   94  118  182  202  138  245  331  177  606  226  204  143  133  226   13
0   98    0   54  315
  SVN   45   71   70   51  106  103   79   65   96  119  114   98   60   89   37   38   90   15
12   50   30    0   95
  PRT  270  354  675  291  392  596  702  568  682  784  803  883  456  548  288  189  498   42
18  314  257   79    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  FRR  IRL  KOR  SVN  PRT
 ----------------------------------------------------------------------------
  AUS    0  311  650  305  661  597  465  584  664  628  643  821  354  390  429  251  425  420
48    8  324  208   73  417
  BEL  230    0  377  321  539  434  375  467  457  479  623  461  262  332  201  177  261  342
37   36  272  145   86  374
  CAN  508  342    0  545 1476  866  946  895 1091 1241  840 2149  618  706  305  318  915  782
81   12  339  436   95  684
  CHE  223  297  386    0  671  401  377  375  451  500  545  600  265  323  187  166  273  344
30   33  258  146   69  330
  DEU  250  389  395  395    0 1666 1081 1644 1346 1981 1838 2220  775 1137  385  326  972 1304
119  110  473  356  146  808
  DFS  307  357  506  325  583    0  755 1124 1086 1215 1242 1366  578  831  398  332  651  887
88   26  453  310  128  708
  ESP  297  342  483  293  475  477    0  802  834 1028  782 1153  525  634  271  314  651  670
75   13  347  311  104  675
  FRA  298  425  460  313  473  411  523    0 1099 1384 1256 1718  602  931  394  292  827  919
80   15  424  307   96  646
  GBR  466  424 1006  425  564  656  654  553    0 1264 1221 1530  598  766  409  342  703  806
84   20  584  343  123  735
  ITA  358  405  750  408  848  740  712  536  890    0 1302 2041  732  962  402  350  896 1037
99   31  447  425  140  832
  NLD  449  644  631  500  840  831  620  575  910  901    0 1510  604  907  493  316  651 1036
114   78  534  293  139  785
  USA  561  369 1824  493  627  700  657  686 1205 1119  987    0  851 1074  475  404 1410 1190
120   22  446  570  121  911
  HUN  211  215  506  205  423  385  395  331  464  550  428  716    0  514  229  251  455  655
61    4  272  289   79  481
  POL  189  249  417  220  505  470  375  375  486  600  599  720  366    0  251  234  526  776
96   70  310  305  115  606
  NZL  304  146  245  151  194  230  211  184  301  276  424  382  174  137    0  187  265  278
27    5  281  128   40  288
  ZAF  212  152  293  150  224  256  292  210  316  300  278  426  218  165  165    0  258  256
32    5  205  182   50  303
  JPN  169  141  245  132  172  208  204  171  227  236  209  294  173  147  105  155    0  591
59    3  260  334   75  459
  CZE  207  238  464  227  709  457  432  483  514  650  795  783  546  478  169  190  147    0
77   26  323  331  120  585
  EST   15   26   30   12   49   39   29   23   31   43   65   68   33   47   11   15   13   36
0    1   41   33   21   65
  FRR    6   32    8   25   84   26    8   12   16   29   51   13    4   75    5    4    3   22
0    0    9    1   13   19
  IRL  272  262  314  256  312  351  336  329  637  395  479  407  230  219  227  196  138  242
20    9    0  148   64  346
  KOR  126   82  376   94  150  182  204  138  245  333  172  615  227  204   80  143  133  226
13    0   98    0   54  318
  SVN   45   72   70   51  117  105   79   65   96  121  113   98   61   91   30   37   38   91
16   12   50   30    0   96
  PRT  270  360  675  291  554  596  704  565  682  784  783  883  456  548  209  288  189  498
42   18  314  260   79    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	FRR	IRL	KOR	SVN	PRT
AUS	0	311	650	305	661	549	460	627	664	628	673	821	354	391	429	250	425	420	48	8	324	208	73	417
BEL	230	0	377	321	539	427	372	475	457	479	635	461	262	332	201	176	261	342	37	36	272	145	86	374
CAN	508	342	0	545	1477	786	943	959	1091	1241	884	2149	618	706	305	318	915	782	81	12	339	436	95	684
CHE	223	297	386	0	671	383	374	381	451	500	558	600	265	323	187	165	273	344	30	33	258	146	69	330
DEU	250	389	395	395	0	1576	1068	1668	1346	1981	1887	2220	775	1138	385	325	972	1304	119	110	473	356	146	808
DFS	307	356	506	325	581	0	701	1091	1026	1171	1243	1270	562	807	370	303	595	854	84	26	434	296	128	683
ESP	291	332	479	287	451	462	0	816	822	1012	787	1140	518	624	264	311	647	661	73	13	340	308	102	656
FRA	299	427	463	313	474	413	497	0	1143	1416	1338	1880	614	939	423	305	892	925	82	16	437	321	96	662
GBR	466	423	1005	425	563	654	630	557	0	1264	1258	1530	598	766	409	341	703	806	84	20	584	343	123	735
ITA	358	405	750	408	848	738	682	539	889	0	1335	2041	732	962	402	349	896	1037	99	31	447	425	140	832
NLD	474	665	680	519	871	854	627	603	950	940	0	1619	616	920	507	324	687	1049	116	84	541	305	139	805
USA	561	369	1824	493	627	699	643	722	1205	1119	1192	0	851	1074	475	403	1410	1190	120	22	446	571	121	911
HUN	211	215	506	205	423	385	388	332	464	550	445	716	0	514	229	251	455	655	61	4	272	289	79	481
POL	189	249	417	220	505	470	362	375	486	600	607	720	366	0	251	234	526	776	96	70	310	305	115	606
NZL	304	146	245	151	194	230	206	186	301	276	443	382	174	137	0	186	265	278	27	5	281	128	40	288
ZAF	212	152	293	150	224	255	289	212	316	300	296	426	218	165	165	0	258	256	32	5	204	182	50	303
JPN	169	141	245	132	172	208	202	171	227	236	211	294	173	147	105	155	0	591	59	3	260	334	75	459
CZE	207	238	464	227	709	457	418	485	514	650	812	783	546	478	169	190	147	0	77	26	323	331	120	585
EST	15	26	30	12	49	39	27	23	31	43	66	68	33	47	11	15	13	36	0	1	41	33	21	65
FRR	6	32	8	25	84	26	8	12	16	29	53	13	4	75	5	4	3	22	0	0	9	1	13	19
IRL	272	262	314	256	312	350	323	331	637	395	491	407	230	219	227	196	138	242	20	9	0	148	64	346
KOR	126	82	377	94	150	182	203	139	245	333	179	616	227	204	80	144	133	226	13	0	98	0	54	318
SVN	45	72	70	51	117	105	75	65	96	121	115	98	61	91	30	37	38	91	16	12	50	30	0	96
PRT	270	360	675	291	554	592	675	568	682	784	808	883	456	548	209	288	189	498	42	18	314	260	79	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  FRR  IRL  KOR  SVN  PRT
 ----------------------------------------------------------------------------
  AUS    0  311  650  305  661  598  473  630  664  628  696  821  354  391  429  251  425  420
48    8  324  206   73  417
  BEL  230    0  377  321  539  435  379  476  457  479  641  461  262  332  201  177  261  342
37   36  272  143   86  374
  CAN  508  342    0  545 1477  866  951  974 1091 1241  915 2149  618  706  305  318  915  782
81   12  339  433   95  684
  CHE  223  297  386    0  671  401  378  384  451  500  566  600  265  323  187  166  273  344
30   33  258  145   69  330
  DEU  250  389  395  395    0 1666 1095 1680 1346 1981 1928 2220  775 1138  385  326  972 1304
119  110  473  353  146  808
  DFS  307  357  507  325  583    0  766 1202 1087 1216 1320 1367  579  832  399  332  651  887
88   26  454  307  128  709
  ESP  299  348  485  294  493  489    0  853  843 1041  830 1162  530  644  274  315  657  675
75   13  352  310  106  687
  FRA  299  427  463  313  476  414  544    0 1156 1426 1457 1919  616  943  427  307  905  929
83   16  442  321   96  665
  GBR  466  424 1006  425  564  656  663  558    0 1264 1285 1530  598  766  409  342  703  806
84   20  585  341  123  735
  ITA  358  405  750  408  848  740  729  540  890    0 1357 2041  732  962  402  350  896 1037
99   31  447  421  140  832
  NLD  477  672  687  520  879  856  665  627  962  941    0 1746  625  929  520  335  720 1053
117   87  548  305  139  815
  USA  561  369 1824  493  627  701  662  757 1205 1119 1229    0  851 1074  475  404 1410 1190
120   22  447  564  121  911
  HUN  211  215  506  205  423  386  401  332  464  550  445  716    0  514  229  251  455  655
61    4  272  285   79  481
  POL  189  249  417  220  505  470  387  375  486  600  608  720  366    0  251  234  526  776
96   70  310  302  115  606
  NZL  304  146  245  151  194  230  213  186  301  276  445  382  174  137    0  187  265  278
27    5  281  126   40  288
  ZAF  212  152  293  150  224  257  293  212  316  300  298  426  218  165  165    0  258  256
32    5  205  180   50  303
  JPN  169  141  245  132  172  208  205  171  227  236  211  294  173  147  105  155    0  591
59    3  260  333   75  459
  CZE  207  238  464  227  709  457  438  485  514  650  812  783  546  478  169  190  147    0
77   26  323  330  120  585
  EST   15   26   30   12   49   39   30   23   31   43   66   68   33   47   11   15   13   36
0    1   41   32   21   65
  FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    5    4    3   22
0    0    9    1   13   19
  IRL  272  262  314  256  312  351  341  331  638  395  494  407  230  219  227  196  138  242
20    9    0  145   64  346
  KOR  125   81  374   93  149  181  203  137  244  331  179  609  225  204   79  142  132  226
13    0   97    0   54  314
  SVN   45   72   70   51  117  105   82   65   96  121  115   98   61   91   30   37   38   91
16   12   50   30    0   96
  PRT  270  360  675  291  554  596  724  568  682  784  815  883  456  548  209  288  189  498
42   18  314  258   79    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  ZAF  JPN  CZE  EST
FRR  IRL  KOR  SVN  PRT
 --------------------------------------------------------------------------
  AUS    0  314  642  304  659  594  447  622  658  627  692  813  354  389  251  424  419   48
8  321  208   73  414
  BEL  230    0  379  321  540  436  370  482  460  479  666  471  262  332  177  265  341   37
36  271  143   86  374
  CAN  507  341    0  545 1477  866  940  974 1091 1241  915 2149  618  706  318  915  782   81
12  339  435   95  684
  CHE  223  298  386    0  671  401  371  384  451  500  566  600  265  323  166  273  344   30
33  258  146   69  330
  DEU  250  389  395  395    0 1666 1059 1680 1346 1981 1928 2220  775 1138  326  972 1304  119
110  473  355  146  808
  DFS  307  357  507  325  583    0  737 1202 1087 1216 1320 1367  579  832  332  651  887   88
26  454  309  128  709
  ESP  288  330  477  284  440  458    0  819  816 1004  794 1134  518  619  309  645  658   72
13  337  307  101  651
  FRA  299  427  463  313  476  414  488    0 1156 1426 1457 1919  616  943  307  905  929   83
16  442  324   96  665
  GBR  465  424 1006  425  564  656  627  558    0 1264 1285 1530  598  766  342  703  806   84
20  582  343  123  735
  ITA  358  405  750  408  848  740  671  540  890    0 1357 2041  732  962  350  896 1037   99
31  447  424  140  832
  NLD  477  689  687  520  879  856  622  627  962  941    0 1746  625  929  335  720 1053  117
87  548  308  139  815
  USA  559  368 1824  493  627  701  639  757 1205 1119 1229    0  851 1074  404 1410 1190  120
22  447  569  121  911
  HUN  211  215  506  205  423  386  388  332  464  550  445  716    0  514  251  455  655   61
4  272  288   79  481
  POL  189  249  417  220  505  470  358  375  486  600  608  720  366    0  234  526  776   96
70  310  304  115  606
  ZAF  212  152  293  150  224  257  287  212  316  300  298  426  218  165    0  258  256   32
5  205  182   50  303
  JPN  169  141  245  132  172  208  201  171  227  236  211  294  173  147  155    0  591   59
3  260  334   75  459
  CZE  207  238  464  227  709  457  416  485  514  650  812  783  546  478  190  147    0   77
26  323  331  120  585
  EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   15   13   36    0
1   41   33   21   65
  FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    4    3   22    0
0    9    1   13   19
  IRL  272  262  314  256  312  351  320  331  635  395  494  407  230  219  196  138  242   20
9    0  148   64  346
  KOR  126   82  377   94  150  182  203  139  245  333  181  616  227  204  144  133  226   13
0   98    0   54  318
  SVN   45   72   70   51  117  105   73   65   96  121  115   98   61   91   37   38   91   16
12   50   30    0   96
  PRT  270  359  675  291  554  596  666  568  682  784  815  883  456  548  288  189  498   42
18  314  260   79    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  FRR  IRL  KOR  SVN  PRT
 ----------------------------------------------------------------------------
  AUS    0  311  650  305  661  598  457  630  664  628  696  821  354  391  429  251  425  420
48    8  324  208   71  417
  BEL  230    0  377  321  539  435  371  476  457  479  641  461  262  332  201  177  261  342
37   36  272  145   84  374
  CAN  508  342    0  545 1477  866  942  974 1091 1241  915 2149  618  706  305  318  915  782
81   12  339  436   93  684
  CHE  223  297  386    0  671  401  372  384  451  500  566  600  265  323  187  166  273  344
30   33  258  146   67  330
  DEU  250  389  395  395    0 1666 1062 1680 1346 1981 1928 2220  775 1138  385  326  972 1304
119  110  473  356  144  808
  DFS  307  357  507  325  583    0  740 1202 1087 1216 1320 1367  579  832  399  332  651  887
88   26  454  310  127  709
  ESP  290  331  478  286  446  460    0  822  819 1008  798 1137  518  621  261  309  647  659
73   13  339  308  100  653
  FRA  299  427  463  313  476  414  490    0 1156 1426 1457 1919  616  943  427  307  905  929
83   16  442  325   94  665
  GBR  466  424 1006  425  564  656  630  558    0 1264 1285 1530  598  766  409  342  703  806
84   20  585  343  121  735
  ITA  358  405  750  408  848  740  678  540  890    0 1357 2041  732  962  402  350  896 1037
99   31  447  425  138  832
  NLD  477  672  687  520  879  856  626  627  962  941    0 1746  625  929  520  335  720 1053
117   87  548  310  137  815
  USA  561  369 1824  493  627  700  641  757 1205 1119 1229    0  851 1074  475  404 1410 1190
120   22  447  571  119  911
  HUN  211  215  506  205  423  386  388  332  464  550  445  716    0  514  229  251  455  655
61    4  272  289   77  481
  POL  189  249  417  220  505  470  359  375  486  600  608  720  366    0  251  234  526  776
96   70  310  305  113  606
  NZL  304  146  245  151  194  230  205  186  301  276  445  382  174  137    0  187  265  278
27    5  281  128   40  288
  ZAF  212  152  293  150  224  257  287  212  316  300  298  426  218  165  165    0  258  256
32    5  205  182   49  303
  JPN  169  141  245  132  172  208  202  171  227  236  211  294  173  147  105  155    0  591
59    3  260  334   74  459
  CZE  207  238  464  227  709  457  417  485  514  650  812  783  546  478  169  190  147    0
77   26  323  331  118  585
  EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   11   15   13   36
 0    1   41   33   20   65
  FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    5    4    3   22
 0    0    9    1   13   19
  IRL  272  262  314  256  312  351  322  331  638  395  494  407  230  219  227  196  138  242
20    9    0  148   63  346
  KOR  126   82  377   94  150  182  203  139  245  333  181  616  227  204   80  144  133  226
13    0   98    0   53  318
  SVN   45   72   70   51  116  105   73   65   96  120  114   97   60   90   30   37   38   91
16   12   50   30    0   95
  PRT  270  360  675  291  554  596  671  568  682  784  815  883  456  548  209  288  189  498
42   18  314  260   79    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  ZAF  JPN  CZE  EST
FRR  IRL  KOR  SVN  PRT
 --------------------------------------------------------------------------
  AUS    0  316  642  304  659  594  447  622  658  627  692  813  343  389  251  417  419   48
8  321  209   71  414
  BEL  230    0  381  322  544  438  370  486  462  482  670  474  260  334  178  267  343   37
36  273  146   84  376
  CAN  507  342    0  545 1477  866  938  974 1091 1241  915 2149  604  706  318  908  781   81
12  339  437   93  684
  CHE  223  298  386    0  671  401  370  384  451  500  566  600  259  323  166  273  344   30
33  258  147   67  330
  DEU  250  389  395  395    0 1666 1056 1680 1346 1981 1928 2220  757 1138  326  969 1304  119
110  473  359  144  808
  DFS  307  357  507  325  583    0  735 1202 1087 1216 1320 1367  564  832  332  645  887   88
26  454  311  127  709
  ESP  288  329  477  283  437  456    0  819  814 1001  792 1132  508  618  309  635  658   72
13  337  310  100  648
  FRA  299  427  463  313  476  414  488    0 1156 1426 1457 1919  598  943  307  892  929   83
16  442  327   94  665
  GBR  465  424 1006  425  564  656  625  558    0 1264 1285 1530  583  766  342  698  806   84
20  582  344  121  735
  ITA  358  405  750  408  848  740  668  540  890    0 1357 2041  719  962  350  890 1037   99
31  447  426  138  832
  NLD  477  693  687  520  879  856  620  627  962  941    0 1746  607  929  335  713 1053  117
87  548  311  137  815
  USA  559  369 1824  493  627  701  638  757 1205 1119 1229    0  821 1074  404 1391 1189  120
22  447  574  119  911
  HUN  203  208  492  201  414  377  374  324  448  534  432  690    0  508  242  445  642   61
4  265  287   77  474
  POL  189  249  417  220  505  470  358  375  486  600  608  720  362    0  234  524  776   96
70  310  306  113  606
  ZAF  212  152  293  150  224  257  287  212  316  300  298  426  207  165    0  256  256   32
5  205  183   49  303
  JPN  169  141  245  132  172  208  201  171  227  236  211  294  167  147  155    0  590   58
3  258  336   74  458
  CZE  207  238  464  227  709  457  416  485  514  649  812  783  534  478  190  147    0   77
26  323  331  118  585
  EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   15   13   36    0
1   41   33   20   65
  FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    4    3   22    0
0    9    1   13   19
  IRL  272  262  314  256  312  351  320  331  635  395  494  407  222  219  196  138  242   20
9    0  149   63  346
  KOR  126   82  377   94  150  182  203  139  245  333  181  620  225  204  144  133  226   13
0   98    0   53  319
  SVN   45   72   70   51  116  105   73   65   96  120  114   97   60   90   37   38   91   16
12   50   30    0   95
  PRT  270  360  675  291  554  596  663  568  682  784  815  883  448  548  288  189  498   42
18  314  260   79    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  POL  NZL  JPN  CZE  EST  FRR
IRL  KOR  SVN  PRT  ZAF
 ------------------------------------------------------------------------------
  AUS    0  244  409  245  433  366  324  370  440  412  420  425  248  260  202  251   37    6
231   91   66  242  114
  BEL  211    0  371  302  509  390  365  466  402  465  548  382  260  194  177  271   37   35
229   79   84  280   91
  CAN  360  340    0  510 1409  709  942  974  909 1223  759 1737  601  299  613  650   79   12
274  254   93  525  166
  CHE  202  282  359    0  565  352  367  381  407  472  448  501  242  181  200  261   29   21
221   75   66  247   82
  DEU  212  378  383  333    0 1418 1036 1606 1129 1917 1641 1764  974  358  691 1061  115  100
374  213  144  599  163
  DFS  257  329  476  294  527    0  635  973  843 1075 1096  970  672  313  410  671   79   26
340  163  123  504  159
  ESP  238  331  479  285  438  411    0  824  706 1001  695  967  521  259  466  552   72   13
270  177  101  494  160
  FRA  232  427  463  311  426  376  494    0  873 1394 1072 1230  790  418  572  748   80   16
331  179   94  473  140
  GBR  363  382  848  383  490  553  521  452    0 1080  986 1153  621  301  447  623   72   15
395  190  119  525  165
  ITA  291  403  748  391  825  676  678  532  774    0 1186 1647  838  387  657  875   98   31
367  251  138  631  185
  NLD  336  554  571  418  752  759  543  514  729  836    0 1133  768  394  466  863  109   70
410  163  134  581  162
  USA  360  340 1551  425  531  600  535  493  985  981  788    0  878  302  851  931  110   15
322  330  116  626  192
  POL  142  195  358  161  408  391  267  299  392  512  500  598    0  173  402  640   83   65
226  204  103  461  131
  NZL  214  145  244  148  188  198  204  186  234  267  346  253   94    0  149  188   25    5
219   60   39  182   83
  JPN  132  113  202  113  144  175  159  142  181  201  169  237  125   80    0  423   46    2
159  178   62  280  113
  CZE  147  193  386  170  578  372  318  356  395  540  694  615  401  120  125    0   67   25
229  202  111  438  154
  EST   15   26   30   12   48   36   27   23   28   43   62   65   38   11   13   30    0    1
32   24   20   56   24
  FRR    5   32    8   17   77   26    8   12   13   29   46   11   71    5    2   21    0    0
9    1   13   13    5
  IRL  222  232  270  226  269  290  269  266  413  337  398  331  166  186  114  183   18    9
0   66   61  234   94
  KOR   60   52  221   53   88  104  100   85  127  199   89  357  148   40   78  141   11    0
46    0   41  172   78
  SVN   44   72   70   51  116  103   75   65   94  120  113   97   80   30   33   87   16   12
50   25    0   86   40
  PRT  179  248  480  199  385  397  457  378  439  551  538  592  417  118  140  353   33   13
203  144   70    0  153
  ZAF  104   84  148   71  111  138  138  110  143  155  135  186  107   72   86  117   13    4
90   54   30  143    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  JPN  CZE  EST
FRR  IRL  KOR  SVN  PRT
 --------------------------------------------------------------------------------
  AUS    0  317  650  305  661  598  459  514  664  628  696  819  354  390  429  425  420   48
8  324  209   48  417
  BEL  230    0  380  321  544  437  371  449  461  481  669  472  264  333  204  267  343   37
36  273  146   57  375
  CAN  508  342    0  545 1477  866  943  818 1091 1241  915 2141  618  705  305  915  782   81
12  339  439   70  684
  CHE  223  298  386    0  671  401  373  359  451  500  566  597  265  322  187  273  344   30
33  258  147   48  330
  DEU  250  389  395  395    0 1666 1067 1551 1346 1981 1928 2213  775 1137  385  972 1304  119
110  473  359  112  808
  DFS  307  357  507  325  583    0  743 1042 1087 1216 1320 1366  579  830  399  651  887   88
26  453  312   96  709
  ESP  291  331  479  287  451  463    0  747  821 1011  801 1135  518  623  263  647  660   73
13  340  310   73  655
  FRA  283  413  430  304  415  407  488    0 1021 1309 1207 1499  572  884  348  751  888   78
14  397  298   72  605
  GBR  466  424 1006  425  564  656  632  546    0 1264 1285 1527  598  765  409  703  806   84
20  584  344   90  735
  ITA  358  405  750  408  848  740  682  520  890    0 1357 2037  732  962  402  896 1037   99
31  447  427  106  832
  NLD  477  693  687  520  879  856  629  567  962  941    0 1743  625  928  520  720 1053  117
87  548  311  100  815
  USA  559  368 1807  489  621  698  641  599 1199 1113 1224    0  851 1070  475 1407 1187  119
20  446  576   89  908
  HUN  211  215  506  205  423  386  388  330  464  550  445  716    0  513  229  455  655   61
4  272  289   62  481
  POL  189  249  417  220  505  470  361  367  486  600  608  718  366    0  251  525  776   96
70  310  306   90  606
  NZL  304  146  245  151  194  230  206  180  301  276  445  380  174  137    0  265  278   27
5  281  130   30  288
  JPN  169  141  245  132  172  208  202  170  227  236  211  294  173  147  105    0  591   59
3  260  337   52  459
  CZE  207  238  464  227  709  457  417  470  514  650  812  780  546  478  169  147    0   77
26  323  331   92  585
  EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   11   13   36    0
1   41   33   17   65
  FRR    6   32    8   25   84   26    8   12   16   29   53   12    4   75    5    3   22    0
0    9    1    8   19
  IRL  272  262  314  256  312  351  323  327  638  395  494  406  230  219  227  138  242   20
9    0  149   43  346
  KOR  126   82  377   94  150  182  203  136  245  333  181  620  227  204   80  133  226   13
0   98    0   41  319
  SVN   30   49   53   38   91   79   53   49   70   90   82   75   47   71   23   23   71   12
8   37   23    0   68
  PRT  270  360  675  291  554  596  674  557  682  784  815  876  456  548  209  189  498   42
18  314  260   56    0
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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  JPN  CZE  EST
FRR  IRL  SVN  PRT
 --------------------------------------------------------------------------
   AUS    0  317  650  305  661  598  459  630  664  628  696  821  354  391  429  425  420   48
8  312   48  417
   BEL  230    0  381  322  544  438  372  486  462  482  670  474  264  334  204  267  343   37
36  264   57  376
   CAN  508  342    0  545 1477  866  943  974 1091 1241  915 2149  618  706  305  915  782   81
12  326   70  684
   CHE  223  298  386    0  671  401  373  384  451  500  566  600  265  323  187  273  344   30
33  250   48  330
   DEU  250  389  395  395    0 1666 1067 1680 1346 1981 1928 2220  775 1138  385  972 1304  119
110  456  113  808
   DFS  307  357  507  325  583    0  743 1202 1087 1216 1320 1367  579  832  399  651  887   88
26  431   97  709
   ESP  291  331  479  287  451  463    0  825  821 1011  801 1139  518  623  263  647  660   73
13  326   73  655
   FRA  299  427  463  313  476  414  494    0 1156 1426 1457 1919  616  943  427  905  929   83
16  414   72  665
   GBR  466  423 1005  425  562  655  629  557    0 1264 1285 1530  598  766  409  703  806   84
20  548   91  735
   ITA  358  405  750  408  848  740  682  540  888    0 1357 2041  732  962  402  896 1037   99
31  432  107  832
   NLD  477  693  687  520  879  856  629  627  960  941    0 1746  625  929  520  720 1053  117
87  513  101  815
   USA  561  369 1824  493  627  701  643  757 1205 1119 1229    0  851 1074  475 1410 1190  120
22  421   90  911
   HUN  211  215  506  205  423  386  388  332  464  550  445  716    0  514  229  455  655   61
4  262   62  481
   POL  189  249  417  220  505  470  361  375  486  600  608  720  366    0  251  526  776   96
70  300   91  606
   NZL  304  146  245  151  194  230  206  186  301  276  445  382  174  137    0  265  278   27
5  267   30  288
   JPN  169  141  245  132  172  208  202  171  227  236  211  294  173  147  105    0  591   59
3  246   52  459
   CZE  207  238  464  227  709  457  417  485  513  650  812  783  546  478  169  147    0   77
26  309   93  585
   EST   15   26   30   12   49   39   27   23   31   43   66   68   33   47   11   13   36    0
1   40   17   65
   FRR    6   32    8   25   84   26    8   12   16   29   53   13    4   75    5    3   22    0
0    9    9   19
   IRL  271  261  313  254  310  350  320  326  615  392  486  401  228  219  223  138  241   20
9    0   43  334
   SVN   30   49   53   38   91   79   53   49   70   91   83   75   47   71   23   23   71   12
8   37    0   68
   PRT  270  360  675  291  554  596  674  568  681  784  815  883  456  548  209  189  498   42
18  313   56    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	JPN	CZE	EST	IRL	SVN	PRT
AUS	0	309	642	304	659	594	465	498	658	627	672	811	343	387	417	419	48	309	48	414
BEL	230	0	375	320	538	433	376	440	455	477	629	456	257	330	257	342	37	262	57	372
CAN	507	342	0	545	1477	866	951	802	1091	1241	883	2141	604	705	899	781	81	326	70	684
CHE	223	297	386	0	671	401	378	349	451	500	555	598	259	321	272	344	30	250	48	330
DEU	250	389	395	395	0	1666	1094	1535	1346	1981	1888	2214	757	1131	965	1304	119	456	112	808
DFS	307	357	507	325	583	0	765	1027	1087	1215	1293	1353	564	830	640	887	88	431	96	709
ESP	299	348	485	293	493	489	0	754	842	1040	810	1158	520	642	644	675	75	338	77	686
FRA	261	403	405	285	392	389	497	0	1002	1292	1170	1473	558	878	733	880	78	376	72	593
GBR	465	423	1005	425	562	655	659	507	0	1264	1260	1523	583	765	691	806	84	545	90	735
ITA	358	405	750	408	848	740	729	486	888	0	1332	2032	719	962	887	1037	99	432	106	832
NLD	454	651	640	502	849	833	636	516	922	903	0	1634	600	915	681	1042	115	508	100	800
USA	559	367	1824	493	625	701	660	557	1204	1119	1020	0	821	1071	1358	1187	120	419	89	910
HUN	203	208	492	201	414	377	387	313	448	534	416	690	0	507	444	642	61	257	62	474
POL	189	249	417	220	505	470	385	360	486	600	600	720	362	0	523	776	96	300	90	606
JPN	169	141	245	132	172	208	205	166	227	236	209	294	167	147	0	588	58	242	52	453
CZE	207	238	464	227	709	457	438	454	513	649	795	782	534	478	147	0	77	309	92	585
EST	15	26	30	12	49	39	30	23	31	43	65	68	33	47	13	36	0	40	17	65
IRL	271	261	313	254	310	350	338	302	612	392	476	401	221	219	138	241	20	0	43	334
SVN	30	49	53	38	91	79	58	49	70	90	82	75	47	71	23	71	12	37	0	68
PRT	270	360	675	291	554	596	722	535	681	784	789	881	448	548	189	498	42	313	56	0

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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
 ------------------------------------------------------------------------------------
  BEL    0  343  250  395  398  334  412  421  308  502  413  261  248   69   33  262
  CAN  332    0  411 1069  771  832  772  993  876  693 1952  631  311  205   43  509
  CHE  235  291    0  430  303  288  283  348  333  378  445  232  193   62   29  219
  DEU  303  315  255    0 1116  819 1122  934 1099 1277 1532  919  318  161   69  482
  DFS  346  504  253  449    0  660 1023 1074  670 1059 1344  680  428  134   62  503
  ESP  313  414  207  342  431    0  689  728  678  654 1019  540  293  145   50  483
  FRA  396  403  229  299  389  456    0  999  732  974 1472  723  375  145   46  450
  GBR  406  932  316  409  653  544  508    0  754  994 1511  634  540  151   59  534
  ITA  291  559  270  441  492  423  352  556    0  726 1165  647  261  190   61  460
  NLD  510  540  345  594  753  499  473  730  553    0 1159  828  426  135   63  545
  USA  355 1709  357  445  700  521  557 1202  717  760    0  948  418  253   58  654
  CZE  191  376  154  517  364  321  346  389  419  664  606    0  235  157   56  414
  IRL  253  310  190  227  350  288  302  606  260  409  401  180    0   55   25  235
  KOR   47  183   45   74   86   87   74  104  158   75  276  110   40    0   21  135
  SVN   32   34   22   59   52   38   30   49   54   50   48   45   22   13    0   44
  PRT  241  472  179  350  390  458  367  432  415  506  594  329  200  114   35    0
 ------------------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      BEL  CHE  DEU  DFS  FRA  GBR  ITA  NLD  USA  CZE  FRR  JPN  IRL  KOR  CAN  PRT  ESP
 ------------------------------------------------------------------------------------
  BEL    0  307  402  257  298  438  335  572  432  238   33  132  234   77  283  160  345
  CHE  290    0  504  231  243  416  388  510  557  236   33  145  214   75  378  137  343
  DEU  307  310    0  763  914  939 1235 1327 1540  858   58  499  277  195  920  316  821
  DFS  206  185  294    0  419  621  509  783  685  429    4  201  253  111  319  212  398
  FRA  263  198  254  165    0  589  713  714  870  530   10  374  200  142  492  227  502
  GBR  414  392  412  345  317    0  845 1143 1476  565   19  336  477  190  685  315  753
  ITA  316  313  460  343  312  608    0  839 1339  676   22  453  260  241  826  329  751
  NLD  586  475  622  496  361  852  608    0 1369  787   73  331  422  161  547  316  703
  USA  360  467  447  343  329 1191  799  903    0  855   21  653  375  329 1319  393 1065
  CZE  174  158  491  226  262  346  433  631  550    0   25  321  180  195  502  252  487
  FRR   31   25   44    4    8   16   20   50   13   21    0    2    6    1    7    7   13
  JPN   84   79  110   96  103  139  154  128  183  102    2    0   97  156  422  155  362
  IRL  236  219  209  192  173  536  253  398  364  136    6   73    0   56  204  114  281
  KOR   52   53   88   65   83  127  197   89  358  137    0   77   39    0  226  142  173
  CAN  280  296  302  242  269  670  543  484 1272  329    6  156  220  208    0  282  634
  PRT  142  105  215  155  190  237  280  265  369  202    7   93   93  117  271    0  277
  ESP  322  259  325  255  319  585  455  546  587  272    8  123  283  100  345  227    0
 ------------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD
 ------------------------------------------------------------------------------------
  AUS    0  109   61   76   38  124  196  103   14
  CAN  113    0   58   95   45   61  281  105   11
  DFS   38   41    0   73   49   69  112   88   13
  GBR   75   97   64    0   47   63  122   81   10
  ITA   36   42   45   45    0   33   59   55   13
  NZL  121   65   48   64   29    0  128   88   14
  USA  184  274   77  125   62  139    0  190   24
  ZAF  107  104   67   77   55   85  201    0   21
  NLD   11    7    8    8   10   12   25   17    0
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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
 ------------------------------------------------------------------------------
   AUS     0   109    61    76    38   124   196    96    14
   CAN   113     0    58    95    45    61   281    94    11
   DFS    38    41     0    73    49    69   112    79    13
   GBR    75    97    64     0    47    63   122    76    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    48    64    29     0   128    79    14
   USA   184   274    77   125    62   139     0   170    24
   ZAF   102    95    62    73    55    77   182     0    21
   NLD    11     7     8     8    10    12    25    17     0
 ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NZL   ZAF   NLD
 ------------------------------------------------------------------------------
   AUS     0   101    55    70    34   119    94    13
   CAN   108     0    54    88    40    57    87     9
   DFS    37    40     0    68    46    68    76    10
   GBR    73    94    63     0    45    61    68     9
   ITA    34    39    45    45     0    31    52    11
   NZL   115    61    48    62    29     0    79    13
   ZAF   101    91    59    70    53    77     0    17
   NLD    11     7     7     7     9    12    15     0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   USA   ZAF   NLD
 ------------------------------------------------------------------------------
   AUS     0   109    59    75    38   196   102     1
   CAN   113     0    58    95    45   281   105     2
   DFS    36    41     0    71    49   112    87     3
   GBR    74    97    62     0    47   122    81     3
   ITA    36    42    45    45     0    59    55     3
   USA   184   274    77   125    62     0   190     6
   ZAF   106   104    66    77    55   201     0     5
   NLD     1     2     3     3     3     6     5     0
 ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
 ------------------------------------------------------------------------------
   AUS     0   109    61    76    38   124   196   103    14
   CAN   113     0    58    95    45    61   281   105    11
   DFS    38    41     0    73    49    69   112    88    13
   GBR    75    97    64     0    47    63   122    81    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    48    64    29     0   128    88    14
   USA   184   274    77   125    62   139     0   190    24
   ZAF   107   104    67    77    55    85   201     0    21
   NLD    11     7     8     8    10    12    25    17     0
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```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
 -------------------------------------------------------------------------------
   AUS     0   109    61    76    38   124   196   103    14
   CAN   113     0    58    95    45    61   281   105    11
   DFS    38    41     0    73    49    69   112    88    13
   GBR    75    97    64     0    47    63   122    81    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    48    64    29     0   128    88    14
   USA   184   274    77   125    62   139     0   190    24
   ZAF   107   104    67    77    55    85   201     0    21
   NLD    11     7     8     8    10    12    25    17     0
 -------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
 -------------------------------------------------------------------------------
   AUS     0   109    61    76    38   124   196   103    14
   CAN   113     0    58    95    45    61   281   105    11
   DFS    38    41     0    73    49    69   112    88    13
   GBR    75    97    64     0    47    63   122    81    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    48    64    29     0   128    88    14
   USA   184   274    77   125    62   139     0   190    24
   ZAF   107   104    67    77    55    85   201     0    21
   NLD    11     7     8     8    10    12    25    17     0
 -------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   ITA   ZAF   NLD
 -------------------------------------------------------------------------------
   AUS     0    66    33    26    60     8
   CAN    65     0    53    38    70     8
   DFS    25    38     0    45    54     9
   ITA    25    37    44     0    45    11
   ZAF    64    68    40    45     0    12
   NLD     7     6     6     8    10     0
 -------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   USA   ZAF   NLD
 -------------------------------------------------------------------------------
   AUS     0   107    59    74    38   195   102    14
   CAN   111     0    58    95    45   281   105    11
   DFS    36    41     0    71    49   112    87    13
   GBR    73    97    62     0    47   122    81    10
   ITA    36    42    45    45     0    59    55    13
   USA   183   274    77   125    62     0   190    24
   ZAF   106   104    66    77    55   201     0    21
   NLD    11     7     8     8    10    25    17     0
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```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
--------------------------------------------------------------------------------
   AUS     0   109    61    76    38   124   196   103    14
   CAN   113     0    58    95    45    61   281   105    11
   DFS    38    41     0    73    49    69   112    88    13
   GBR    75    97    64     0    47    63   122    81    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    48    64    29     0   128    88    14
   USA   184   274    77   125    62   139     0   190    24
   ZAF   107   104    67    77    55    85   201     0    21
   NLD    11     7     8     8    10    12    25    17     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
--------------------------------------------------------------------------------
   AUS     0   109    59    76    38   124   196   103    14
   CAN   113     0    52    95    45    61   281   105    11
   DFS    37    39     0    63    49    62   105    80    13
   GBR    75    97    58     0    47    62   122    80    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    43    63    29     0   128    87    14
   USA   184   274    73   125    62   139     0   190    24
   ZAF   107   104    64    76    55    84   201     0    21
   NLD    11     7     8     8    10    12    25    17     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
--------------------------------------------------------------------------------
   AUS     0   109    61    76    38   124   196   103    14
   CAN   113     0    58    95    45    61   281   105    11
   DFS    38    41     0    73    49    69   112    88    13
   GBR    75    97    64     0    47    63   122    81    10
   ITA    36    42    45    45     0    33    59    55    13
   NZL   121    65    48    64    29     0   128    88    14
   USA   184   274    77   125    62   139     0   190    24
   ZAF   107   104    67    77    55    85   201     0    21
   NLD    11     7     8     8    10    12    25    17     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   USA   ZAF   NLD
--------------------------------------------------------------------------------
   AUS     0   107    59    74    38   195   102    14
   CAN   111     0    58    95    45   278   105    11
   DFS    36    41     0    71    49   112    87    13
   GBR    73    96    62     0    47   122    81    10
   ITA    36    42    45    45     0    59    55    13
   USA   183   272    77   125    62     0   190    24
   ZAF   106   104    66    77    55   201     0    21
   NLD    11     7     8     8    10    25    17     0
--------------------------------------------------------------------------------
```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD
---------------------------------------------------------------------------
  AUS    0   109    61    76    38   124   196   103    14
  CAN  113     0    58    95    45    61   281   105    11
  DFS   38    41     0    73    49    69   112    88    13
  GBR   75    97    64     0    47    63   122    81    10
  ITA   36    42    45    45     0    33    59    55    13
  NZL  121    65    48    64    29     0   128    88    14
  USA  184   274    77   125    62   139     0   190    24
  ZAF  107   104    67    77    55    85   201     0    21
  NLD   11     7     8     8    10    12    25    17     0
---------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   USA   ZAF   NLD
---------------------------------------------------------------------------
  AUS    0   107    59    74    38   195    95    14
  CAN  111     0    58    95    45   281    94    11
  DFS   36    41     0    71    49   112    78    13
  GBR   73    97    62     0    47   122    76    10
  ITA   36    42    45    45     0    59    55    13
  USA  183   274    77   125    62     0   170    24
  ZAF  101    95    61    73    55   182     0    21
  NLD   11     7     8     8    10    25    17     0
---------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   NZL   ZAF   NLD
---------------------------------------------------------------------------
  AUS    0    62    29    68    59     8
  CAN   60     0    44    57    83     9
  DFS   20    35     0    55    67    10
  NZL   61    60    39     0    75    13
  ZAF   64    83    51    68     0    15
  NLD    7     6     7    11    13     0
---------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NZL   USA   NLD
---------------------------------------------------------------------------
  AUS    0   109    61    33    38   124   196    14
  CAN  113     0    58    37    45    61   281    11
  DFS   38    41     0    29    49    69   112    13
  GBR   37    43    27     0    14    33    37     4
  ITA   36    42    45    15     0    33    59    13
  NZL  121    65    48    37    29     0   128    14
  USA  184   274    77    40    62   139     0    24
  NLD   11     7     8     5    10    12    25     0
---------------------------------------------------------------------------
```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   NZL   USA   NLD
-------------------------------------------------------------------------------
  AUS     0   109    61    76   124   196    14
  CAN   113     0    58    95    61   278    11
  DFS    38    41     0    73    69   112    13
  GBR    75    96    64     0    62   122    10
  NZL   121    65    48    63     0   128    14
  USA   184   272    77   125   139     0    24
  NLD    11     7     8     8    12    25     0
-------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   USA   NLD
-------------------------------------------------------------------------------
  AUS     0   107    59    74    38   194    14
  CAN   111     0    58    95    45   281    11
  DFS    36    41     0    71    49   112    13
  GBR    73    96    62     0    47   122    10
  ITA    36    42    45    45     0    59    13
  USA   182   274    77   125    62     0    24
  NLD    11     7     8     8    10    25     0
-------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
-------------------------------------------------------------------------------
  AUS     0    21     8    36     7    14    16    10     6
  CAN    20     0     6    82    47     3    29   113     2
  DEU     7     6     0    28     0     7     3     0     6
  DFS    27    77    18     0    29    65    50    51    18
  GBR     6    46     0    27     0     0    19    35     0
  NOR    11     3     6    52     0     0     8     0    15
  NZL    16    27     3    48    16     7     0    18     2
  USA    10   105     0    47    32     0    17     0     1
  NLD     6     2     5    18     0    14     2     1     0
-------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NZL   USA   NLD
-------------------------------------------------------------------------------
  AUS     0    21     8    36     7    16    10     6
  CAN    20     0     6    82    47    29   113     2
  DEU     7     6     0    28     0     3     0     4
  DFS    27    77    18     0    29    47    51    14
  GBR     6    46     0    27     0    19    35     0
  NZL    16    27     3    45    16     0    18     2
  USA    10   105     0    47    32    17     0     1
  NLD     6     2     3    14     0     2     1     0
-------------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
--------------------------------------------------------------------------------
   AUS    0    21     8    36     7     4    16    10     6
   CAN   20     0     6    82    47     0    29   111     2
   DEU    7     6     0    28     0     2     3     0     5
   DFS   27    77    18     0    29    30    47    51    14
   GBR    6    46     0    27     0     0    19    34     0
   NOR    4     0     1    21     0     0     2     0    10
   NZL   16    27     3    45    16     2     0    18     2
   USA   10   104     0    47    31     0    17     0     1
   NLD    6     2     4    14     0     9     2     1     0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   USA   NLD
--------------------------------------------------------------------------------
   AUS    0    21     8    36     7    10     6
   CAN   20     0     6    82    47   113     2
   DEU    7     6     0    28     0     0     4
   DFS   27    77    18     0    29    51    15
   GBR    6    46     0    27     0    35     0
   USA   10   105     0    47    32     0     1
   NLD    6     2     3    15     0     1     0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
--------------------------------------------------------------------------------
   AUS    0    21     8    36     7    14    16    10     6
   CAN   20     0     6    82    47     3    29   113     2
   DEU    7     6     0    28     0     7     3     0     6
   DFS   27    77    18     0    29    73    46    51    17
   GBR    6    46     0    27     0     0    19    35     0
   NOR   11     3     6    58     0     0     8     0    15
   NZL   16    27     3    42    16     7     0    18     2
   USA   10   105     0    47    32     0    17     0     1
   NLD    6     2     5    17     0    14     2     1     0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NZL   USA   NLD
--------------------------------------------------------------------------------
   AUS    0    21     8    36     7    16    10     6
   CAN   20     0     6    82    47    29   113     2
   DEU    7     6     0    28     0     3     0     6
   DFS   27    77    18     0    29    47    51    17
   GBR    6    46     0    27     0    19    35     0
   NZL   16    27     3    45    16     0    18     2
   USA   10   105     0    47    32    17     0     1
   NLD    6     2     5    17     0     2     1     0
--------------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
 -----------------------------------------------------------------------------
   AUS     0    21     8    36     7    14    16    10     6
   CAN    20     0     6    82    47     3    29   113     2
   DEU     7     6     0    28     0     7     3     0     6
   DFS    27    77    18     0    29    76    50    51    18
   GBR     6    46     0    27     0     0    19    35     0
   NOR    11     3     6    60     0     0     8     0    15
   NZL    16    27     3    48    16     7     0    18     2
   USA    10   105     0    47    32     0    17     0     1
   NLD     6     2     5    18     0    14     2     1     0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   NOR   NLD
 -----------------------------------------------------------------------------
   AUS     0    10     8    24    12     6
   CAN    10     0     6    81     3     2
   DEU     7     6     0    28     7     4
   DFS    18    76    18     0    73    15
   NOR    10     3     6    58     0    15
   NLD     6     2     3    15    14     0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD
 -----------------------------------------------------------------------------
   AUS     0    21     5    36     7    14    10     6
   CAN    20     0     3    82    47     3   113     2
   DEU     4     3     0    15     0     5     0     4
   DFS    27    77     9     0    29    73    51    16
   GBR     6    46     0    27     0     0    35     0
   NOR    11     3     4    58     0     0     0    15
   USA    10   105     0    47    32     0     0     1
   NLD     6     2     3    16     0    14     1     0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
 -----------------------------------------------------------------------------
   AUS     0    21     8    36     7    14    16    10     6
   CAN    20     0     6    82    47     3    29   113     2
   DEU     7     6     0    28     0     7     3     0     4
   DFS    27    77    18     0    29    76    50    51    16
   GBR     6    46     0    27     0     0    19    35     0
   NOR    11     3     6    60     0     0     8     0    15
   NZL    16    27     3    48    16     7     0    18     2
   USA    10   105     0    47    32     0    17     0     1
   NLD     6     2     3    16     0    14     2     1     0
 -----------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
 -------------------------------------------------------------------------------
   AUS    0    21     8    36     7    14    16    10     6
   CAN   20     0     6    82    47     3    29   113     2
   DEU    7     6     0    28     0     7     3     0     5
   DFS   27    77    18     0    29    73    47    51    16
   GBR    6    46     0    27     0     0    19    35     0
   NOR   11     3     6    58     0     0     8     0    15
   NZL   16    27     3    44    16     7     0    18     2
   USA   10   105     0    47    32     0    17     0     1
   NLD    6     2     4    16     0    14     2     1     0
 -------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
 -------------------------------------------------------------------------------
   AUS    0    21     8    36     7    14    16    10     6
   CAN   20     0     6    82    47     3    29   113     2
   DEU    7     6     0    28     0     7     3     0     6
   DFS   27    77    18     0    29    66    50    51    18
   GBR    6    46     0    27     0     0    19    35     0
   NOR   11     3     6    53     0     0     8     0    15
   NZL   16    27     3    48    16     7     0    18     2
   USA   10   105     0    47    32     0    17     0     1
   NLD    6     2     5    18     0    14     2     1     0
 -------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD
 -------------------------------------------------------------------------------
   AUS    0    21     8    36     7    14    10     6
   CAN   20     0     6    82    47     3   110     2
   DEU    7     6     0    28     0     7     0     6
   DFS   27    77    18     0    29    76    51    18
   GBR    6    46     0    27     0     0    35     0
   NOR   11     3     6    60     0     0     0    15
   USA   10   104     0    47    32     0     0     1
   NLD    6     2     5    18     0    14     1     0
 -------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
 -------------------------------------------------------------------------------
   AUS    0    21     8    36     7    14    16    10     6
   CAN   20     0     6    82    47     3    29   113     2
   DEU    7     6     0    28     0     7     3     0     6
   DFS   27    77    18     0    29    73    47    51    17
   GBR    6    46     0    27     0     0    19    35     0
   NOR   11     3     6    58     0     0     8     0    15
   NZL   16    27     3    45    16     7     0    18     2
   USA   10   105     0    47    32     0    17     0     1
   NLD    6     2     5    17     0    14     2     1     0
 -------------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD
--------------------------------------------------------------------------------
  AUS    0    21     8    36     7    14    10     6
  CAN   20     0     6    82    47     3   111     2
  DEU    7     6     0    28     0     7     0     6
  DFS   27    77    18     0    29    70    51    16
  GBR    6    46     0    27     0     0    34     0
  NOR   11     3     6    55     0     0     0    13
  USA   10   104     0    47    31     0     0     1
  NLD    6     2     5    16     0    12     1     0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   NOR   NZL   NLD
--------------------------------------------------------------------------------
  AUS    0     7     7    20    10     6     6
  CAN    7     0     5    76     3    29     2
  DEU    6     5     0    21     7     3     4
  DFS   15    70    15     0    65    41    15
  NOR    8     3     6    53     0     8    15
  NZL    6    27     3    41     7     0     1
  NLD    6     2     3    15    14     1     0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
--------------------------------------------------------------------------------
  AUS    0    21     8    36     7    14    16    10     6
  CAN   20     0     6    82    44     3    29   113     2
  DEU    7     6     0    28     0     7     3     0     6
  DFS   27    77    18     0    29    75    48    51    18
  GBR    6    43     0    27     0     0    16    33     0
  NOR   11     3     6    60     0     0     8     0    15
  NZL   16    27     3    46    13     7     0    18     2
  USA   10   105     0    47    30     0    17     0     1
  NLD    6     2     5    18     0    14     2     1     0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   NZL   USA   NLD
--------------------------------------------------------------------------------
  AUS    0    21     8    36     7    14    16    10     6
  CAN   20     0     6    82    44     3    29   110     2
  DEU    7     6     0    28     0     7     3     0     6
  DFS   27    77    18     0    29    76    50    51    18
  GBR    6    43     0    27     0     0    16    33     0
  NOR   11     3     6    60     0     0     8     0    15
  NZL   16    27     3    48    13     7     0    18     2
  USA   10   104     0    47    30     0    17     0     1
  NLD    6     2     5    18     0    14     2     1     0
--------------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD
----------------------------------------------------------------------------
  AUS    0    21     8    36     7    14    10     6
  CAN   20     0     6    82    44     3   113     2
  DEU    7     6     0    28     0     7     0     6
  DFS   27    77    18     0    29    76    51    18
  GBR    6    43     0    27     0     0    33     0
  NOR   11     3     6    60     0     0     0    15
  USA   10   105     0    47    30     0     0     1
  NLD    6     2     5    18     0    14     1     0
----------------------------------------------------------------------------
```