```
function mpc = case1354pegase
%CASE1354PEGASE  Power flow data for medium part of European system.
%   Please see CASEFORMAT for details on the case file format.
%
%   This case accurately represents the size and complexity of part of
the
%   European high voltage transmission network. The network contains
1,354
%   buses, 260 generators, and 1,991 branches and it operates at 380
and
%   220 kV. Please note that the data are fictitious and do not
correspond
%   to real world data. They can thus be used to validate methods and
tools
%   but should not be used for operation and planning of the European
grid.
%
%   The data stems from the Pan European Grid Advanced Simulation and
State
%   Estimation (PEGASE) project, part of the 7th Framework Program of
the
%   European Union (http://www.fp7-pegase.com/).
%
%   When publishing results based on this data, please cite:
%
%     C. Josz, S. Fliscounakis, J. Maeght, and P. Panciatici, "AC Power
Flow
%     Data in MATPOWER and QCQP Format: iTesla, RTE Snapshots, and
PEGASE"
%     http://arxiv.org/abs/1603.01533
%
%     S. Fliscounakis, P. Panciatici, F. Capitanescu, and L. Wehenkel,
%     "Contingency ranking with respect to overloads in very large
power
%     systems taking into account uncertainty, preventive and
corrective
%     actions", Power Systems, IEEE Trans. on, (28)4:4909-4917, 2013.
%     http://dx.doi.org/10.1109/TPWRS.2013.2251015
%
%   Remarks:
%
%   1. Line flow limits are 100 MVA (at 1 p.u. voltage) lower than the
%   current flow limits found in PEGASE data.
%
%   2. PEGASE data contains asymmetric shunt conductance and
susceptance in
%   the PI transmission line model of branches. Thus total line
charging
%   susceptance of branches is set to 0 p.u. and the nodal
representation
%   of shunt condutance and susceptance is used. As a result, power
flow
%   equations are left unchanged compared with original PEGASE data.
%   However, line flow constraints in the optimal flow problem are
%   modified.
%
```

```
%   3. Identical linear costs are used for all generators to form a
loss
%   minimizing OPF objective function.
%
%   4. Since some parts of the network are aggregated, some generators
%   (e.g. with negative PMIN) represent aggregations of multiple loads
%   and generators.
%
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%     9 rue de la Porte de Buc, 78000 Versailles Cedex, France
%
%   March 18th, 2015

%   MATPOWER
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Jean Maeght,
%   and Patrick Panciatici
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%   http://creativecommons.org/licenses/by/4.0/

%% MATPOWER Case Format : Version 2
mpc.version = '2';

%%-----  Power Flow Data  -----%%
%% system MVA base
mpc.baseMVA = 100;

%% bus data
%   bus_i   type    Pd  Qd  Gs  Bs  area    Vm  Va  baseKV  zone
Vmax    Vmin
mpc.bus = [
    3   1   151 48.8    0   4.69    0   1.016674    -21.761632  220 5
1.1 0.9;
    4   1   171.41  23.4    0   2.1 0   1.026472    -7.007354   220 5
1.1 0.9;
    10  1   134 24.7    0   12.44   0   1.038534    -24.281644  220 5
1.1 0.9;
    21  1   161.2   39.3    0   30.71   0   1.036195    -21.958828  220
5   1.1 0.9;
    22  1   0   -0  0   0.85    0   1.035058    -18.483339  220 5   1.1
0.9;
    26  1   167.3   54.8    0   110.54  0   1.032267    -3.318448   380
5   1.1 0.9;
    29  1   152.9   49.4    0   27.65   0   0.994409    -13.816418  380
5   1.1 0.9;
    44  1   -0  0   0   7.27    0   1.045829    -22.181066  220 5   1.1
0.9;
    53  1   48.65   16.1    0   7.14    0   1.063422    -9.070013   220
5   1.1 0.9;
```

```
    58  1   0   0   0   2.31    0   0.983702    -21.159412  380 5   1.1
0.9;
    59  1   119.2   20.7    0   3.31    0   1.036808    -23.631999  220
5   1.1 0.9;
    90  1   363.25  115.39  0   3.95    0   1.042187    -27.546292  220
5   1.1 0.9;
    96  1   -8.4    28.66   0   3.49    0   1.030441    -15.689479  220
5   1.1 0.9;
    113 1   -0  -0  0   6.532711    0   1.030718    -14.242909  380 5
1.1 0.9;
    115 1   0   -0  0   4.21    0   1.066797    -19.783678  220 5   1.1
0.9;
    118 1   704.53  -35.33  0   13.102834   0   1.020256    -11.430028
380 5   1.1 0.9;
    124 2   0   0   0   0   0   1.081537    8.330657    220 5   1.1
0.9;
    128 1   23.73   12.7    0   0.52    0   1.020482    -16.063366  220
5   1.1 0.9;
    145 1   38.34   5.6 0   7.64    0   1.039096    -8.903623   220 5
1.1 0.9;
    148 1   32.34   12  0   6.1 0   1.041568    -7.991267   220 5   1.1
0.9;
    150 2   0   0   0   0   0   1.062805    2.531831    220 5   1.1
0.9;
    163 1   147.76  32.73   0   8.34    0   1.047047    -10.672351  220
5   1.1 0.9;
    171 1   100.8   13.2    0   5.24    0   1.069649    -25.153324  220
5   1.1 0.9;
    174 1   370.5   -17 0   9.91    0   1.074846    -27.942789  220 5
1.1 0.9;
    184 1   -0  -0  0   2.42    0   1.042771    -11.94851   220 5   1.1
0.9;
    188 1   36.84   13.9    0   3.3 0   1.018752    -19.550413  220 5
1.1 0.9;
    195 1   73.14   21.55   0   8.52    0   1.056337    -8.791116   220
5   1.1 0.9;
    196 1   0   -0  0   12.48   0   1.074825    -26.319857  220 5   1.1
0.9;
    198 1   39.74   11.8    0   1.44    0   1.01673 -16.306681  220 5
1.1 0.9;
    207 1   321.98  84.4    0   1.34    0   1.026604    -13.457588  220
5   1.1 0.9;
    216 1   155.6   54.7    0   2.21    0   1.039362    -24.590496  220
5   1.1 0.9;
    217 1   105.2   0.1 0   7.36    0   1.042762    -2.603638   220 5
1.1 0.9;
    218 1   69.83   15.12   0   2.23    0   1.045923    -13.114892  220
5   1.1 0.9;
    221 2   0   0   0   0   0   0.984682    -21.807603  380 5   1.1
0.9;
    225 1   0   0   0   1.15    0   1.063761    -20.174043  220 5   1.1
0.9;
    280 1   119.6   29.6    0   5.34    0   1.035725    -11.193679  220
5   1.1 0.9;
    283 1   27.33   11.9    0   1.17    0   1.035204    -12.094637  220
5   1.1 0.9;
```

```
    292 1   13.82   1.4 0   0.7 0   1.047544    -14.765137  220 5   1.1
0.9;
    305 1   103 12  0   0.63    0   1.067188    -32.434719  220 5   1.1
0.9;
    306 1   -0  0   0   4.76    0   1.030032    -18.823594  220 5   1.1
0.9;
    314 1   163.1   46.3    0   10.6    0   1.005548    -16.020947  220
5   1.1 0.9;
    333 1   524.5   43  0   6.85    0   1.014579    -42.137692  220 5
1.1 0.9;
    338 2   0   0   0   0   0   1.048249    -6.162533   220 5   1.1
0.9;
    346 1   197.5   48.3    0   0.71    0   1.040694    -21.298393  220
5   1.1 0.9;
    350 1   110.4   26.2    0   5.62    0   1.043185    -24.295117  220
5   1.1 0.9;
    352 2   0   0   0   0   0   1.055378    0.262953    380 5   1.1
0.9;
    367 1   65.17   -51.5   0   4.85    0   1.07164 -23.599251  220 5
1.1 0.9;
    401 1   56.5    36.29   0   3.08    0   1.026548    -14.262083  220
5   1.1 0.9;
    408 1   129.1   7.4 0   0.04    0   1.039791    -11.549917  220 5
1.1 0.9;
    410 1   170.89  50.38   0   6.44    0   1.041564    -26.439994  220
5   1.1 0.9;
    413 2   0   0   0   0   0   1.05013 -6.606455   220 5   1.1 0.9;
    416 1   70.68   13.5    0   6.96    0   1.0458  -6.728632   220 5
1.1 0.9;
    426 1   123.1   6.5 0   3.25    0   1.040489    -18.395441  220 5
1.1 0.9;
    432 1   -0  -0  0   68.517663   0   1.047774    2.403578    380 5
1.1 0.9;
    444 1   0   -0  0   2.45    0   1.036267    -12.201434  220 5   1.1
0.9;
    449 1   0   0   0   29.42   0   1.021739    -8.489958   380 5   1.1
0.9;
    453 2   0   0   0   0   0   1.018914    -7.857046   380 5   1.1
0.9;
    455 1   274.32  5.66    0   13.24   0   1.045882    -30.596498  220
5   1.1 0.9;
    490 1   20.52   4   0   2.77    0   1.036451    -23.014287  220 5
1.1 0.9;
    500 1   144.4   35.5    0   7.66    0   1.040423    -15.042452  220
5   1.1 0.9;
    502 1   -0  0   0   1.96    0   1.043564    -6.675538   220 5   1.1
0.9;
    506 1   -0  0   0   0.4 0   1.063297    -9.078728   380 5   1.1
0.9;
    513 1   57.46   17.1    0   1.61    0   1.038461    -7.443414   220
5   1.1 0.9;
    516 2   0   0   0   0   0   1.075592    -33.453515  220 5   1.1
0.9;
    520 1   118.5   20.4    0   2.57    0   1.048239    -27.108761  220
5   1.1 0.9;
    549 1   0   -0  0   5.15    0   1.074517    -10.959606  220 5   1.1
0.9;
```

```
    554 1   0   -0  0   1.97    0   1.024071    -20.793083  220 5   1.1
0.9;
    556 1   16.52   9   0   1.17    0   1.03694 -22.762979  220 5   1.1
0.9;
    561 1   0   -0  0   0.32    0   1.055451    -11.021763  220 5   1.1
0.9;
    564 2   0   0   0   0   0   1.069817    -47.078276  220 5   1.1
0.9;
    575 1   0   -0  0   0.67    0   1.04436 -11.163788  220 5   1.1
0.9;
    583 2   0   0   0   0   0   1.045397    -15.568574  220 5   1.1
0.9;
    594 1   67.57   17  0   5.75    0   1.036683    -8.869667   220 5
1.1 0.9;
    601 1   140.6   42.6    0   5.71    0   1.040685    -14.418335  220
5   1.1 0.9;
    604 1   33.24   4.4 0   24.54   0   0.996939    -12.93567   380 5
1.1 0.9;
    608 1   150.9   10.4    0   4.77    0   1.071753    -32.66829   220
5   1.1 0.9;
    609 1   -0  -0  0   5.67    0   1.025344    -14.779536  220 5   1.1
0.9;
    615 2   0   0   0   0   0   1.063876    -10.607341  220 5   1.1
0.9;
    616 2   0   0   0   0   0   1.048713    -12.997468  220 5   1.1
0.9;
    619 1   72.88   14.4    0   2.96    0   1.046742    -25.252227  220
5   1.1 0.9;
    639 2   0   0   0   0   0   1.051376    -29.999643  220 5   1.1
0.9;
    641 1   45.32   18.5    0   0.74    0   1.03515 -13.956622  220 5
1.1 0.9;
    658 1   258.4   66.7    0   5.87    0   1.033849    -17.442414  220
5   1.1 0.9;
    661 1   -0  -0  0   0.6 0   1.040021    2.414523    380 5   1.1
0.9;
    666 1   -5.61   -2.79   0   150.93  0   1.03076 -5.413919   380 5
1.1 0.9;
    678 1   232.1   89.8    0   0.09    0   0.986375    -18.62447   220
5   1.1 0.9;
    682 2   0   0   0   0   0   1.0691  -10.045044  220 5   1.1 0.9;
    687 1   -0  0   0   5.6 0   1.05742 -4.068613   220 5   1.1 0.9;
    707 1   83.99   21.2    0   5.36    0   1.054495    -25.620212  220
5   1.1 0.9;
    718 1   135.11  41  0   5.31    0   1.031148    -24.884639  220 5
1.1 0.9;
    720 1   -0  -0  0   23.554121   0   0.981824    -26.763103  380 5
1.1 0.9;
    726 1   400.3   189.9   0   0.53    0   1.048069    -4.933448   220
5   1.1 0.9;
    742 1   0   -0  0   2.83    0   1.05759 -4.070122   220 5   1.1
0.9;
    747 1   69.58   16  0   3.03    0   1.073922    -26.380554  220 5
1.1 0.9;
    749 2   0   0   0   0   0   1.057884    -28.950791  220 5   1.1
0.9;
```

```
    750 1   -0  -0  0   18.63   0   1.041141    -24.444747  220 5   1.1
0.9;
    757 2   0   0   0   0   0   1.017567    -13.765564  380 5   1.1
0.9;
    766 1   -0  0   0   7.85    0   1.047952    -19.8489    220 5   1.1
0.9;
    769 1   152.57  40  0   6.12    0   1.024104    -10.886119  220 5
1.1 0.9;
    772 1   343.9   141.9   0   5.55    0   1.034361    -14.167643  220
5   1.1 0.9;
    776 2   0   0   0   0   0   1.026368    -13.331099  220 5   1.1
0.9;
    778 2   0   0   0   0   0   1.049411    -6.680953   220 5   1.1
0.9;
    789 1   -0  -0  0   6.63    0   1.051689    -5.954643   220 5   1.1
0.9;
    795 2   0   0   0   0   0   1.035522    -15.484388  220 5   1.1
0.9;
    800 1   50.56   18  0   0.11    0   1.034778    -12.128589  220 5
1.1 0.9;
    803 2   0   0   0   0   0   1.041369    -24.768342  220 5   1.1
0.9;
    804 1   -0  -0  0   7.26    0   1.05585 -7.563603   220 5   1.1
0.9;
    805 1   124.5   29.6    0   15.4    0   1.05673 -11.12828   220 5
1.1 0.9;
    809 1   0   -0  0   58.088687   0   1.027525    -0.064839   380 5
1.1 0.9;
    819 1   0   -0  0   0.22    0   1.052169    -0.720463   220 5   1.1
0.9;
    823 2   0   0   0   0   0   1.044097    -2.229251   380 5   1.1
0.9;
    839 1   -0  -0  0   8.17514 0   1.024385    -1.386321   380 5   1.1
0.9;
    851 2   0   0   0   0   0   1.00025 -17.401395  220 5   1.1 0.9;
    858 2   0   0   0   0   0   1.031745    1.110134    380 5   1.1
0.9;
    870 1   110 3.4 0   11.95   0   1.040762    -24.602002  220 5   1.1
0.9;
    871 1   108.89  -21.76  0   3.72    0   1.056945    -11.955754  220
5   1.1 0.9;
    883 1   192.5   78.3    0   6.65    0   1.017176    -10.133417  220
5   1.1 0.9;
    891 2   0   0   0   0   0   1.064525    -18.97841   380 5   1.1
0.9;
    892 1   -0  -0  0   9.1 0   1.069234    -34.99461   220 5   1.1
0.9;
    900 1   0   0   0   0.15    0   1.050278    -15.385577  220 5   1.1
0.9;
    903 1   82.69   20.1    0   1.36    0   1.073885    -26.405705  220
5   1.1 0.9;
    905 1   631.71  -54.16  0   7.534129    0   1.035643    -15.075813
380 5   1.1 0.9;
    907 1   -0  -0  0   0.05    0   1.038555    -9.767436   220 5   1.1
0.9;
    908 1   125.9   -0.5    0   0.21    0   1.065214    -7.929625   220
5   1.1 0.9;
```

```
    920 1   34.44   8.5 0   1.11    0   1.045537    -20.769903  220 5
1.1 0.9;
    923 1   62.07   14.7    0   4.84    0   1.035596    -23.090183  220
5   1.1 0.9;
    933 1   -0  0   0   22.75   0   1.019946    -21.525393  220 5   1.1
0.9;
    935 1   -0  0   0   9.46    0   1.049182    -24.470238  220 5   1.1
0.9;
    953 1   108.7   -12.15  0   37.11   0   1.065973    -13.014498  380
5   1.1 0.9;
    954 1   66.27   13.6    0   0.67    0   1.044324    -21.525875  220
5   1.1 0.9;
    960 1   -0  -0  0   108.728602  0   1.063295    -9.078724   380 5
1.1 0.9;
    964 1   88.5    16.5    0   146.44  0   1.015553    -11.659761  380
5   1.1 0.9;
    972 2   0   0   0   0   0   1.072621    5.35893 380 5   1.3 0.7;
    980 1   14.71   4.6 0   7.88    0   1.047164    -25.138433  220 5
1.1 0.9;
    1001    2   0   0   0   0   0   1.074143    -33.62199   220 5   1.1
0.9;
    1002    2   0   0   0   0   0   1.041506    -20.086455  220 5   1.1
0.9;
    1005    1   0   0   0   0.81    0   1.053955    -12.379476  220 5
1.1 0.9;
    1015    1   44.55   0   0   4.78    0   1.056277    -5.398682   220
5   1.1 0.9;
    1026    1   201.4   53  0   9.67    0   1.028182    -29.352232  220
5   1.1 0.9;
    1027    1   -5.91   -2.33   0   30.393595   0   0.990542    -
18.181223  380 5   1.1 0.9;
    1033    1   26.33   5.3 0   4.31    0   1.040934    -24.521854  220
5   1.1 0.9;
    1035    1   382.5   57.9    0   8.16    0   1.067815    -32.322562
220 5   1.1 0.9;
    1039    1   34.64   -0  0   0.91    0   1.034441    -19.543294  220
5   1.1 0.9;
    1040    1   31.94   8.8 0   3.79    0   1.038913    -9.027471   220
5   1.1 0.9;
    1043    2   0   0   0   0   0   1.028946    -3.693426   380 5   1.1
0.9;
    1051    1   -0  0   0   3.79    0   1.041627    -12.829065  220 5
1.1 0.9;
    1077    1   -0  0   0   0.1 0   1.035206    -12.094658  220 5   1.1
0.9;
    1078    1   -0  -0  0   4.74    0   1.061509    -3.472987   220 5
1.1 0.9;
    1081    1   277.86  58.95   0   182.880644  0   1.038644    -
10.509999  380 5   1.1 0.9;
    1083    2   0   0   0   0   0   1.049472    -8.613737   220 5   1.1
0.9;
    1090    1   56.06   18.7    0   4.24    0   1.0101  -21.692579  220
5   1.1 0.9;
    1093    2   0   0   0   0   0   1.027056    -8.507308   380 5   1.1
0.9;
    1096    1   0   -0  0   0.16    0   1.050189    -1.116839   220 5
1.1 0.9;
```

```
    1100    2   0   0   0   0   0   1.042801    -4.348181   220 5   1.1
0.9;
    1101    1   -0  -0  0   2.05    0   1.033508    -14.209132  220 5
1.1 0.9;
    1102    2   0   0   0   0   0   1.049879    -6.64195    220 5   1.1
0.9;
    1105    1   29.83   7.3 0   6.49    0   1.074759    -26.325932  220
5   1.1 0.9;
    1111    1   0   0   0   1.1 0   1.036823    -8.871578   220 5   1.1
0.9;
    1129    1   190.47  55.03   0   6.7 0   1.003325    -22.532961  220
5   1.1 0.9;
    1136    1   16.22   2   0   0.71    0   1.034786    -18.539009  220
5   1.1 0.9;
    1137    1   -0  -0  0   0.05    0   1.048666    -24.42816   220 5
1.1 0.9;
    1146    1   32.84   -0  0   1.41    0   1.032638    -5.627486   220
5   1.1 0.9;
    1151    1   -0  -0  0   18.82   0   1.043354    -20.606997  220 5
1.1 0.9;
    1153    1   12.41   3.9 0   2.23    0   1.034654    -6.058841   220
5   1.1 0.9;
    1156    1   65.67   24  0   9.95    0   1.038055    -22.501868  220
5   1.1 0.9;
    1159    1   112.4   13  0   3.99    0   1.052615    -36.244174  220
5   1.1 0.9;
    1172    1   -0  -0  0   2.3 0   1.074468    -25.55724   220 5   1.1
0.9;
    1179    1   86.6    23.4    0   0.39    0   1.040896    -2.802576
220 5   1.1 0.9;
    1183    1   199.4   -19.9   0   6.68    0   1.066643    -33.081849
220 5   1.1 0.9;
    1187    1   67.57   21.2    0   5.71    0   1.039857    -4.955282
220 5   1.1 0.9;
    1188    1   30.93   6.6 0   9.09    0   1.054495    -14.222981  220
5   1.1 0.9;
    1194    1   129.6   13.3    0   13.98   0   1.03896 -15.127161  380
5   1.1 0.9;
    1198    1   0   0   0   30.637696   0   0.987964    -14.637206  380
5   1.1 0.9;
    1201    1   114.1   23.5    0   1.08    0   1.050304    -19.627666
220 5   1.1 0.9;
    1216    1   0   0   0   4.93    0   1.040626    -10.966354  220 5
1.1 0.9;
    1233    1   0   -0  0   1.72    0   1.037981    -22.526704  220 5
1.1 0.9;
    1234    1   71.78   17.9    0   1.96    0   1.022628    -16.524518
220 5   1.1 0.9;
    1237    2   0   0   0   0   0   1.108028    -6.285992   380 5   1.3
0.7;
    1248    1   0   0   0   1.17    0   1.047205    -10.673893  220 5
1.1 0.9;
    1249    1   348.93  26.47   0   9.36    0   1.019402    -11.26449
380 5   1.1 0.9;
    1251    2   0   0   0   0   0   1.027102    -8.516785   380 5   1.1
0.9;
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    1262    1   -0  0   0   10.73   0   1.038607    -22.034538  220 5
1.1 0.9;
    1265    1   173 -21.3   0   5.93    0   1.066705    -50.057306  220
5   1.1 0.9;
    1275    1   52.46   2.9 0   0.35    0   1.032647    -18.856368  220
5   1.1 0.9;
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0.9;
    1301    1   479 99.2    0   10.68   0   1.05167 -28.720012  220 5
1.1 0.9;
    1305    1   -0  -0  0   4.34    0   1.038253    -22.269637  220 5
1.1 0.9;
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380 5   1.1 0.9;
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1.1 0.9;
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1.1 0.9;
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0.9;
    1343    1   -0  -0  0   58.3    0   0.996377    -14.200565  380 5
1.1 0.9;
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0.9;
    1355    1   -3.29   -1.32   0   190.704588  0   1.0328  -8.554156
380 5   1.1 0.9;
    1364    1   40.85   14.5    0   0.59    0   1.039851    -12.092524
220 5   1.1 0.9;
    1380    1   145.2   21.4    0   1.09    0   1.033661    -22.574327
220 5   1.1 0.9;
    1394    1   30.93   7.6 0   4.69    0   1.074659    -26.314245  220
5   1.1 0.9;
    1397    1   0   -0  0   2.14    0   1.037924    -12.820941  220 5
1.1 0.9;
    1398    1   196.7   44.2    0   0.1 0   1.017322    -19.003234  220
5   1.1 0.9;
    1401    1   11.91   2.9 0   5.27    0   1.038647    -14.758146  220
5   1.1 0.9;
    1414    1   144.7   20.3    0   6.35    0   1.022683    -27.895964
220 5   1.1 0.9;
    1415    1   0   -0  0   0.3 0   1.032141    -11.506028  220 5   1.1
0.9;
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0.9;
    1435    1   -0  0   0   3.85    0   1.044674    -24.345986  220 5
1.1 0.9;
    1436    2   0   0   0   0   0   1.047684    -12.917585  220 5   1.1
0.9;
    1448    1   0   0   0   9.49    0   1.075069    -15.319825  220 5
1.1 0.9;
    1459    1   -0  -0  0   3.38    0   1.042934    -21.817757  220 5
1.1 0.9;
    1462    1   -0  0   0   0.42    0   1.043552    -20.967069  220 5
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15.339654  380 5   1.1 0.9;
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0.9;
    1483    1   0   0   0   4.86    0   1.064156    -26.867437  220 5
1.1 0.9;
    1486    1   79.59   18.8    0   6.78    0   1.034956    -23.34269
220 5   1.1 0.9;
    1494    1   -1.85   -1.63   0   31.424588   0   1.034255    -
11.521816  380 5   1.1 0.9;
    1502    1   -0  0   0   37.116157   0   1.027764    -26.693479  380
5   1.1 0.9;
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1.1 0.9;
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    1538    1   36.34   15.2    0   0.3 0   1.033256    -8.75699    220
5   1.1 0.9;
    1539    1   73.58   3.24    0   52.35   0   1.059384    -15.296455
220 5   1.1 0.9;
    1541    1   125.4   45.8    0   0   0   1.039282    -23.538177  220
5   1.1 0.9;
    1545    1   42.55   8.2 0   2.06    0   1.042222    -23.472695  220
5   1.1 0.9;
    1547    1   -0  -0  0   1.02    0   1.040481    -15.042995  220 5
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    1551    1   -0  -0  0   7.99    0   1.043158    -20.41875   220 5
1.1 0.9;
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5   1.1 0.9;
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1.1 0.9;
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220 5   1.1 0.9;
    1566    1   156.9   -4  0   2.48    0   1.036219    -24.756749  220
5   1.1 0.9;
    1568    1   69.08   21.5    0   1.65    0   1.046858    -25.154702
220 5   1.1 0.9;
    1578    1   0   -0  0   1.38    0   1.040417    -12.029853  220 5
1.1 0.9;
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1.1 0.9;
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220 5   1.1 0.9;
    1595    1   71.77   13.57   0   3.84    0   1.01584 -29.283839  220
5   1.1 0.9;
    1604    2   0   0   0   0   0   1.043862    -6.640235   220 5   1.1
0.9;
    1605    1   -0  0   0   0.05    0   1.076968    -24.357645  220 5
1.1 0.9;
    1607    1   73.78   -0  0   2.69    0   1.030671    -5.514136   380
5   1.1 0.9;
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0.9;
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220 5   1.1 0.9;
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    1672    1   -28.13  -0.83   0   0.1 0   1.061821    -11.405066  220
5   1.1 0.9;
    1680    2   0   0   0   0   0   1.04395 -2.225166   380 5   1.1
0.9;
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    1704    1   62.16   8   0   2.99    0   1.038923    -13.052366  220
5   1.1 0.9;
    1708    2   0   0   0   0   0   1.037938    -13.186223  380 5   1.1
0.9;
    1709    1   -15.38  -4.94   0   33.241519   0   1.007462    -
14.734072  380 5   1.1 0.9;
    1711    1   25.13   -61.6   0   3.68    0   1.052686    -29.767092
220 5   1.1 0.9;
    1721    2   0   0   0   0   0   1.062238    2.466713    220 5   1.1
0.9;
    1730    1   -17.18  -4.35   0   44.419365   0   1.025799    -
14.51076   380 5   1.1 0.9;
    1742    1   0   0   0   6.68    0   1.030326    -32.491405  220 5
1.1 0.9;
    1746    1   -0  0   0   1.86    0   1.049354    -24.089302  220 5
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5   1.1 0.9;
    1754    2   0   0   0   0   0   1.04286 -17.149587  380 5   1.1
0.9;
    1758    1   0   -0  0   121.29  0   1.03465 -4.424306   380 5   1.1
0.9;
    1763    1   -0  -0  0   0.28    0   1.034875    -30.808254  380 5
1.1 0.9;
    1767    1   333.5   -1.4    0   8.37    0   1.049612    -45.569227
220 5   1.1 0.9;
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    1775    1   -0  0   0   1.64    0   1.05106 -25.97492   220 5   1.1
0.9;
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0.9;
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7.424983   380 5   1.1 0.9;
    1803    1   -0  -0  0   0.05    0   1.038883    -22.036572  220 5
1.1 0.9;
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220 5   1.1 0.9;
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0.9;
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0.9;
    1857    1   0   0   0   1.53    0   1.028608    -11.055937  220 5
1.1 0.9;
    1860    1   88.8    -3.2    0   13.63   0   1.060858    -25.532569
220 5   1.1 0.9;
    1866    1   209.2   23.5    0   6.44    0   1.04474 -28.285319  220
5   1.1 0.9;
    1868    1   11.71   3.8 0   2.96    0   1.035258    -15.877966  220
5   1.1 0.9;
    1876    1   -0  -0  0   6.273568    0   1.030797    -14.242223  380
5   1.1 0.9;
    1883    1   27.33   5   0   6.77    0   1.029787    -16.425673  220
5   1.1 0.9;
    1888    2   0   0   0   0   0   1.039377    -2.376673   220 5   1.1
0.9;
    1895    1   20.82   -0  0   0.14    0   1.070353    7.588403    220
5   1.1 0.9;
    1896    1   -0  -0  0   1.18    0   1.021131    -6.153674   380 5
1.1 0.9;
    1910    1   -0  0   0   2.68    0   1.049243    -6.695385   220 5
1.1 0.9;
    1914    2   0   0   0   0   0   1.035636    -20.619184  220 5   1.1
0.9;
    1917    1   197.5   -31 0   17.34   0   1.050486    -25.132946  220
5   1.1 0.9;
    1923    1   192.11  45.5    0   68.04   0   1.002407    -11.646061
380 5   1.1 0.9;
    1940    1   0   0   0   1.19    0   1.03614 -18.037347  220 5   1.1
0.9;
    1959    2   0   0   0   0   0   1.064692    -10.511132  220 5   1.1
0.9;
    1965    1   248.7   8.1 0   12.46   0   1.066548    -49.702693  220
5   1.1 0.9;
    1973    1   210.1   66.2    0   59.36   0   1.074741    -26.300211
220 5   1.1 0.9;
    1979    1   0   0   0   0.14    0   1.074144    -33.621995  220 5
1.1 0.9;
    1980    1   177.3   36.4    0   0.7 0   1.040983    -21.42173   220
5   1.1 0.9;
    1998    1   25.73   7.3 0   2.82    0   1.033294    -20.141362  220
5   1.1 0.9;
    2012    1   41.45   4.9 0   18.43   0   1.038506    -18.675791  220
5   1.1 0.9;
    2019    1   72.08   21.3    0   7.19    0   1.044528    -21.078894
220 5   1.1 0.9;
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    2020    1   0   0   0   9.98    0   1.051074    -24.096673  220 5
1.1 0.9;
    2021    1   3.9 1   0   3.81    0   1.050096    -24.96566   220 5
1.1 0.9;
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0.9;
    2042    1   14.02   6.5 0   0.09    0   1.037536    -5.903671   220
5   1.1 0.9;
    2043    1   3.2 1.7 0   0.05    0   1.043517    -20.967534  220 5
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1.1 0.9;
    2050    2   0   0   0   0   0   1.009914    -1.144693   380 5   1.1
0.9;
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    2057    1   120.2   20.5    0   19.94   0   1.04971 -30.773674  220
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    2072    1   101.2   2.1 0   38.43   0   1.065746    -17.405584  380
5   1.1 0.9;
    2078    1   77.19   18.6    0   2.22    0   1.020675    -14.721188
220 5   1.1 0.9;
    2079    1   0   -0  0   13.94   0   1.050272    -12.128304  220 5
1.1 0.9;
    2083    1   121.4   20.2    0   16.61   0   1.035   -18.482915  220
5   1.1 0.9;
    2085    2   0   0   0   0   0   1.040351    2.467063    380 5   1.1
0.9;
    2088    1   -0  0   0   6.02    0   1.052176    -12.052739  220 5
1.1 0.9;
    2089    1   199.86  56.93   0   46.83   0   1.04312 -25.770522  220
5   1.1 0.9;
    2093    1   -5.64   -2.84   0   34.582195   0   1.016671    -
8.086067   380 5   1.1 0.9;
    2101    1   -0  -0  0   38.32   0   1.02998 -5.549174   380 5   1.1
0.9;
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220 5   1.1 0.9;
    2129    1   0   0   0   56.686515   0   1.016495    -8.242431   380
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    2142    1   0   -0  0   7.63    0   1.050391    -7.902365   220 5
1.1 0.9;
    2155    1   63.67   20.2    0   6.13    0   1.037645    -5.893797
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    2161    1   35.66   -9.39   0   7.89    0   1.048364    -28.662661
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    2174    1   0   0   0   61.795782   0   1.011944    -13.202451  380
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0.9;
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5   1.1 0.9;
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```
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    2229    1   0   -0  0   2.91    0   1.062959    -13.080678  220 5
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    2230    1   0   -0  0   1.71    0   1.036513    -22.481463  220 5
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    2231    1   0   0   0   0.45    0   1.049391    1.166976    220 5
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    2242    1   -0  -0  0   2.76    0   1.02489 -19.020985  220 5   1.1
0.9;
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220 5   1.1 0.9;
    2273    1   141.3   32.4    0   7.29    0   1.074359    -26.339387
220 5   1.1 0.9;
    2276    2   0   0   0   0   0   1.05324 -23.758819  220 5   1.1
0.9;
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220 5   1.1 0.9;
    2288    1   170.9   39  0   11.25   0   1.034468    -8.57662    220
5   1.1 0.9;
    2291    2   0   0   0   0   0   1.072528    -10.610728  220 5   1.1
0.9;
    2303    1   0   -0  0   7.94    0   1.03744 -15.856049  220 5   1.1
0.9;
    2304    1   88.7    -0.1    0   2.83    0   1.058495    -25.832763
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    2308    1   32.04   6.6 0   0.44    0   1.038612    -24.078628  220
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    2313    1   0   -0  0   0.41    0   1.046654    -21.265608  220 5
1.1 0.9;
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    2327    1   114.5   25.2    0   17.57   0   1.047194    -25.133812
220 5   1.1 0.9;
    2328    1   -0  0   0   0.4 0   1.017489    -14.250876  220 5   1.1
0.9;
    2337    1   103.4   27  0   1.41    0   1.045493    -29.7818    220
5   1.1 0.9;
    2340    1   96.91   13.9    0   3.98    0   1.03958 -12.236094  220
5   1.1 0.9;
    2341    1   -0  0   0   3.28    0   1.065118    -26.070582  220 5
1.1 0.9;
    2359    2   0   0   0   0   0   1.024884    -9.921886   380 5   1.1
0.9;
    2360    1   215.5   31.3    0   14.23   0   1.044563    -21.085033
220 5   1.1 0.9;
    2361    1   16.9    3.85    0   25.09   0   1.052288    -29.004707
220 5   1.1 0.9;
    2365    1   37.94   15.4    0   117.386167  0   1.033702    -
22.17424   380 5   1.1 0.9;
    2372    1   0   -0  0   14.490904   0   0.991274    -17.482034  380
5   1.1 0.9;
```

```
    2377    1   101.7   17.6    0   13.14   0   1.036655    -14.897845
220 5   1.1 0.9;
    2393    1   20.82   0   0   0.13    0   1.070495    7.700354    220
5   1.1 0.9;
    2406    1   0   0   0   1.69    0   1.048666    -24.428158  220 5
1.1 0.9;
    2421    2   0   0   0   0   0   1.047766    -23.702161  220 5   1.1
0.9;
    2424    1   44.55   16.8    0   2.31    0   1.034979    -22.416002
220 5   1.1 0.9;
    2425    2   0   0   0   0   0   1.041186    -9.882232   220 5   1.1
0.9;
    2426    2   0   0   0   0   0   1.037687    -13.762974  220 5   1.1
0.9;
    2430    1   -0  0   0   6.21    0   1.041369    -11.921713  220 5
1.1 0.9;
    2432    1   291.2   35.4    0   21.87   0   1.030479    -32.300033
220 5   1.1 0.9;
    2438    1   -0  0   0   0.64    0   1.046626    -21.265307  220 5
1.1 0.9;
    2446    2   0   0   0   0   0   1.06157 7.557722    380 5   1.1
0.9;
    2457    1   30.73   9.6 0   2.75    0   1.040059    -24.619174  220
5   1.1 0.9;
    2458    1   132 26  0   27.18   0   1.006537    -13.460583  380 5
1.1 0.9;
    2467    1   0   -0  0   11.65   0   1.018095    -14.100158  220 5
1.1 0.9;
    2468    2   0   0   0   0   0   1.048132    -6.215141   220 5   1.1
0.9;
    2475    1   0   0   0   0.21    0   1.065573    -7.808732   220 5
1.1 0.9;
    2479    1   -2.65   -1.17   0   65.673108   0   1.008158    -
2.627166   380 5   1.1 0.9;
    2481    2   0   0   0   0   0   1.042777    -18.185589  220 5   1.1
0.9;
    2489    2   0   0   0   0   0   1.049366    1.167288    220 5   1.1
0.9;
    2503    1   -0  0   0   2.09    0   1.012856    -21.48175   220 5
1.1 0.9;
    2510    1   115.87  29.41   0   7.92    0   1.028486    -12.08393
220 5   1.1 0.9;
    2518    1   -5.29   -1.91   0   42.622979   0   0.999088    -
11.536983  380 5   1.1 0.9;
    2526    1   238.45  46.86   0   125.534496  0   1.044376    -
19.855823  380 5   1.1 0.9;
    2527    1   59.77   16.7    0   0.64    0   1.043988    -4.63491
220 5   1.1 0.9;
    2535    1   51.56   2.1 0   0.18    0   1.037544    -2.896669   220
5   1.1 0.9;
    2550    2   0   0   0   0   0   1.049384    -6.666685   220 5   1.1
0.9;
    2558    1   159.27  38.31   0   2.18    0   1.023305    -16.640241
220 5   1.1 0.9;
    2563    1   52.86   13  0   6.04    0   1.046977    -4.707678   220
5   1.1 0.9;
```

```
    2575    1   62.97   17.4    0   0.3 0   1.04159 -2.724929   220 5
1.1 0.9;
    2591    1   253.77  84.6    0   20.71   0   1.030923    -15.233022
220 5   1.1 0.9;
    2597    1   14.72   5.4 0   0.72    0   1.033106    -10.863404  220
5   1.1 0.9;
    2598    1   25.63   12.7    0   8.42    0   1.040506    -15.286014
220 5   1.1 0.9;
    2600    2   0   0   0   0   0   1.038821    -13.64341   220 5   1.1
0.9;
    2627    2   0   0   0   0   0   1.061488    7.521439    380 5   1.1
0.9;
    2629    1   203.1   65.2    0   0.64    0   1.045498    -24.492103
220 5   1.1 0.9;
    2641    1   0   0   0   1.72    0   1.042124    -11.251293  220 5
1.1 0.9;
    2644    1   0   0   0   0.19    0   1.07369 -24.808555  220 5   1.1
0.9;
    2653    2   0   0   0   0   0   1.036517    -23.007774  220 5   1.1
0.9;
    2654    1   207.1   50.4    0   4.93    0   1.019228    -18.770253
220 5   1.1 0.9;
    2656    1   -0.72   0   0   69.582294   0   1.034308    -22.749906
380 5   1.1 0.9;
    2676    1   123.24  23.65   0   6.44    0   1.035697    -14.93988
220 5   1.1 0.9;
    2689    1   0   0   0   0.45    0   1.034001    -3.213772   220 5
1.1 0.9;
    2695    1   16.22   8.9 0   2.2 0   1.038344    -21.004788  220 5
1.1 0.9;
    2702    1   151.7   27.6    0   6.49    0   1.043222    -25.609448
220 5   1.1 0.9;
    2719    2   0   0   0   0   0   1.035384    -15.495326  220 5   1.1
0.9;
    2721    1   -0  0   0   10.040547   0   0.983623    -22.371652  380
5   1.1 0.9;
    2732    1   85.59   20.72   0   142.79  0   1.013054    -10.064991
380 5   1.1 0.9;
    2749    1   55.56   26.5    0   1.09    0   1.049925    -30.124895
220 5   1.1 0.9;
    2751    1   34.54   8.6 0   5.05    0   1.042162    -21.896741  220
5   1.1 0.9;
    2754    1   -0  0   0   3.72    0   1.051994    -13.365671  220 5
1.1 0.9;
    2770    1   85.39   14.3    0   0.35    0   1.047946    -9.667144
220 5   1.1 0.9;
    2782    1   -28.13  -0.81   0   0.1 0   1.06184 -11.404239  220 5
1.1 0.9;
    2786    2   0   0   0   0   0   1.073795    6.427789    380 5   1.3
0.7;
    2794    1   0   -0  0   0.39    0   1.035004    -18.482955  220 5
1.1 0.9;
    2795    1   -0  -0  0   1.94    0   1.070164    -32.44656   220 5
1.1 0.9;
    2797    2   0   0   0   0   0   1.042226    -4.483231   220 5   1.1
0.9;
```

```
    2799    2   0   0   0   0   0   1.05396 -12.355638  220 5   1.1
0.9;
    2801    1   0   -0  0   12.17   0   1.041023    -24.502823  220 5
1.1 0.9;
    2806    1   -0  -0  0   0.39    0   1.050477    0.170291    220 5
1.1 0.9;
    2815    1   25.33   14.2    0   4.05    0   1.03655 -22.984441  220
5   1.1 0.9;
    2816    2   0   0   0   0   0   1.053944    -0.390904   380 5   1.1
0.9;
    2841    2   0   0   0   0   0   1.08248 -26.223645  220 5   1.1
0.9;
    2842    2   0   0   0   0   0   1.043712    -6.650222   220 5   1.1
0.9;
    2847    1   40.14   8.8 0   0.82    0   1.050663    -3.956106   220
5   1.1 0.9;
    2848    1   453.23  139.16  0   25.583218   0   0.998047    -
7.830482   380 5   1.1 0.9;
    2850    1   -0  -0  0   4.76    0   1.03307 -18.741426  220 5   1.1
0.9;
    2854    1   -12.33  -2.65   0   69.323028   0   1.044838    -
10.677353  380 5   1.1 0.9;
    2863    1   37.73   13.84   0   0.09    0   1.028402    -11.074681
220 5   1.1 0.9;
    2866    1   -0  0   0   4.21    0   1.03784 -7.272198   220 5   1.1
0.9;
    2872    2   0   0   0   0   0   1.063841    -10.631082  220 5   1.1
0.9;
    2877    1   29.93   -0  0   0.46    0   1.041807    -14.920901  220
5   1.1 0.9;
    2878    2   0   0   0   0   0   1.057626    -10.952158  220 5   1.1
0.9;
    2886    2   0   0   0   0   0   1.055151    -14.128145  220 5   1.1
0.9;
    2888    1   -0  0   0   0.22    0   1.013722    -21.258074  220 5
1.1 0.9;
    2889    1   -0  0   0   3.2 0   1.050185    -1.116811   220 5   1.1
0.9;
    2898    1   56.76   13.4    0   1.18    0   1.035844    -23.070363
220 5   1.1 0.9;
    2902    2   0   0   0   0   0   1.059072    -23.273273  220 5   1.1
0.9;
    2910    1   -0  0   0   2.87    0   1.040554    -2.262281   220 5
1.1 0.9;
    2918    1   0   0   0   53.25003    0   1.02385 -28.205516  380 5
1.1 0.9;
    2919    1   -0  0   0   32.049116   0   0.991588    -18.308905  380
5   1.1 0.9;
    2924    1   19.92   7.4 0   17.28   0   1.057573    -33.080856  220
5   1.1 0.9;
    2928    1   0   -0  0   92.38   0   1.074568    -26.335879  220 5
1.1 0.9;
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0.9;
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220 5   1.1 0.9;
```

```
    2934    2   0   0   0   0   0   1.051149    -6.52803    220 5   1.1
0.9;
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1.1 0.9;
    2940    1   103 28.7    0   2.88    0   1.01671 -14.352513  220 5
1.1 0.9;
    2949    1   -0  -0  0   11.03   0   1.050433    -4.837602   220 5
1.1 0.9;
    2961    1   159.9   53.2    0   7.99    0   1.041215    -24.387727
220 5   1.1 0.9;
    2967    1   0   -0  0   0.19    0   1.046973    -17.07434   220 5
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    2972    1   97.82   20.59   0   6.67    0   1.038342    -15.064035
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    2980    1   -0  0   0   0.42    0   1.063297    -9.078731   380 5
1.1 0.9;
    2981    1   -0  0   0   1.68    0   1.075422    -15.322665  220 5
1.1 0.9;
    2985    2   0   0   0   0   0   1.053607    -8.47854    220 5   1.1
0.9;
    2995    1   0   -0  0   3.9 0   1.051891    -3.763961   220 5   1.1
0.9;
    3013    1   2.2 1.1 0   0.67    0   1.049575    -5.241034   220 5
1.1 0.9;
    3018    2   0   0   0   0   0   1.041705    -12.798969  220 5   1.1
0.9;
    3019    1   0   -0  0   1.37    0   1.036837    -22.763335  220 5
1.1 0.9;
    3021    1   74.38   8.8 0   6.1 0   1.042535    -11.458053  220 5
1.1 0.9;
    3022    1   149 19.8    0   23.89   0   1.038441    -14.928463  380
5   1.1 0.9;
    3028    2   0   0   0   0   0   1.030654    0.605264    380 5   1.1
0.9;
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220 5   1.1 0.9;
    3037    1   221 146.8   0   8.35    0   1.04857 -6.585978   220 5
1.1 0.9;
    3044    1   29.33   5.6 0   6.56    0   1.044991    -21.014316  220
5   1.1 0.9;
    3051    1   0   0   0   0   0   1.031148    -24.884639  220 5   1.1
0.9;
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220 5   1.1 0.9;
    3070    1   0   -0  0   4.27    0   1.013716    -21.258029  220 5
1.1 0.9;
    3071    1   0   -0  0   2.83    0   1.044715    -7.284056   220 5
1.1 0.9;
    3072    1   92.9    27.7    0   5.22    0   1.050676    -30.097241
220 5   1.1 0.9;
    3075    1   30.33   10.5    0   0.33    0   1.020662    -16.898848
220 5   1.1 0.9;
    3082    1   0   0   0   75.076038   0   0.998938    -15.122127  380
5   1.1 0.9;
```

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    3083    1   567.97  130.73  0   1.09    0   1.068389    -27.641331
220 5   1.1 0.9;
    3085    1   64.67   24.5    0   1.46    0   1.067218    -27.697899
220 5   1.1 0.9;
    3112    1   -0  0   0   0   0   1.057299    2.403578    220 5   1.1
0.9;
    3114    2   0   0   0   0   0   1.071964    -11.598423  220 5   1.1
0.9;
    3121    1   242.16  73.64   0   12.79   0   1.031627    -7.214885
220 5   1.1 0.9;
    3126    1   104.78  20.92   0   6.17    0   1.021547    -17.925447
220 5   1.1 0.9;
    3133    2   0   0   0   0   0   1.065372    -9.169038   220 5   1.1
0.9;
    3134    2   0   0   0   0   0   1.023117    -15.704702  220 5   1.1
0.9;
    3137    1   0   -0  0   0.03    0   1.065118    -26.070583  220 5
1.1 0.9;
    3145    1   860.95  -182.67 0   18.309116   0   0.993017    -
41.441031  380 5   1.1 0.9;
    3166    1   184.91  32.8    0   8.35    0   1.039048    -17.527734
220 5   1.1 0.9;
    3183    2   0   0   0   0   0   1.055515    -11.832574  220 5   1.1
0.9;
    3184    1   14.12   7.7 0   1.42    0   1.040299    -21.338667  220
5   1.1 0.9;
    3187    1   107 34.7    0   1.54    0   1.042404    -12.953299  220
5   1.1 0.9;
    3191    1   127.8   15.2    0   9.34    0   1.040776    -12.071062
220 5   1.1 0.9;
    3200    1   86.2    19.9    0   5.43    0   1.036168    -23.053307
220 5   1.1 0.9;
    3204    1   8.51    3.2 0   0.96    0   1.017023    -10.267075  220
5   1.1 0.9;
    3205    2   0   0   0   0   0   1.041982    -1.292668   380 5   1.1
0.9;
    3218    2   0   0   0   0   0   1.028507    -11.253521  220 5   1.1
0.9;
    3221    1   76.38   24.8    0   3.24    0   1.047766    -12.146786
220 5   1.1 0.9;
    3231    1   251.3   42.6    0   5.47    0   1.025161    -14.287368
220 5   1.1 0.9;
    3239    1   -5.06   -1.84   0   187.327025  0   1.056229    -
11.611515  380 5   1.1 0.9;
    3240    2   0   0   0   0   0   1.050305    -1.129073   220 5   1.1
0.9;
    3241    1   132 27  0   4.66    0   1.030192    -17.957576  220 5
1.1 0.9;
    3243    1   -0  0   0   1.18    0   0.990554    -18.181283  380 5
1.1 0.9;
    3246    1   20.9    -171.5  0   0.21    0   1.080513    7.863586
220 5   1.1 0.9;
    3248    1   84.19   17.3    0   6.2 0   1.05498 -11.325947  220 5
1.1 0.9;
    3255    1   0   0   0   1.44    0   1.038882    -22.03657   220 5
1.1 0.9;
```

```
    3276    1   -0  -0  0   0.13    0   1.050076    -7.893785   220 5
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220 5   1.1 0.9;
    3306    2   0   0   0   0   0   1.071978    8.08029 220 5   1.1
0.9;
    3324    2   0   0   0   0   0   1.014126    -16.129669  220 5   1.1
0.9;
    3325    1   -0  0   0   0.91    0   1.033998    -20.055869  220 5
1.1 0.9;
    3327    1   -0  -0  0   2.27    0   1.038066    -12.156606  220 5
1.1 0.9;
    3331    1   -0  -0  0   4.56    0   1.0175  -10.215862  220 5   1.1
0.9;
    3344    1   83.29   24.1    0   1.23    0   1.039524    -16.595479
220 5   1.1 0.9;
    3346    2   0   0   0   0   0   1.01594 -12.063974  380 5   1.1
0.9;
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0.9;
    3364    2   0   0   0   0   0   1.0538  -12.359552  220 5   1.1
0.9;
    3377    1   77.49   21.4    0   0.05    0   1.018192    -10.51029
220 5   1.1 0.9;
    3390    2   0   0   0   0   0   1.039984    -11.495624  220 5   1.1
0.9;
    3391    1   302.5   65.1    0   8.87    0   1.059691    -20.937372
220 5   1.1 0.9;
    3400    1   0   0   0   17.31   0   1.047571    -25.085016  220 5
1.1 0.9;
    3401    1   23.22   6.3 0   0.66    0   1.034711    -14.123031  220
5   1.1 0.9;
    3412    1   -0  0   0   0   0   1.057299    2.403578    220 5   1.1
0.9;
    3422    2   0   0   0   0   0   1.063657    -10.680951  220 5   1.1
0.9;
    3430    1   125.1   44  0   6.04    0   1.015255    -16.040907  220
5   1.1 0.9;
    3435    1   -0  0   0   10.13   0   1.043606    -25.55539   220 5
1.1 0.9;
    3436    2   0   0   0   0   0   1.060777    -13.286433  220 5   1.1
0.9;
    3445    1   45.14   -6.64   0   88.82001    0   0.999706    -
5.879329   380 5   1.1 0.9;
    3450    1   78.99   16.2    0   1.97    0   1.046643    -21.48337
220 5   1.1 0.9;
    3481    1   142.5   23.6    0   4.24    0   1.023602    -20.789174
220 5   1.1 0.9;
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2.264367    380 5   1.1 0.9;
    3485    1   -0  0   0   6.501668    0   0.991148    -16.268999  380
5   1.1 0.9;
    3486    1   101.5   -18.3   0   8.47    0   1.037237    -20.871205
220 5   1.1 0.9;
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5   1.1 0.9;
```

```
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0.9;
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5   1.1 0.9;
    3498    1   138.5   19.3    0   5.26    0   1.04022 -10.181185  220
5   1.1 0.9;
    3499    1   180.4   71.6    0   81.042938   0   1.035853    -
3.63424    380 5   1.1 0.9;
    3502    1   98.2    19.1    0   10.92   0   1.020854    -10.552336
220 5   1.1 0.9;
    3503    1   -0  0   0   1.93    0   1.032128    -11.505891  220 5
1.1 0.9;
    3513    2   0   0   0   0   0   1.028771    -3.782955   380 5   1.1
0.9;
    3519    1   -0  0   0   68.053762   0   1.033967    -22.784898  380
5   1.1 0.9;
    3520    1   -0  0   0   2.47    0   1.037612    -5.896123   220 5
1.1 0.9;
    3526    1   33.34   13.2    0   0.76    0   1.056871    -4.128916
220 5   1.1 0.9;
    3535    1   -0  0   0   0.49    0   1.035787    -24.451001  220 5
1.1 0.9;
    3541    1   0   -0  0   3.34    0   1.039193    -23.983552  220 5
1.1 0.9;
    3543    1   -0  -0  0   14.079026   0   0.991625    -17.553669  380
5   1.1 0.9;
    3545    1   20.12   7.6 0   0.89    0   1.049206    -8.009952   220
5   1.1 0.9;
    3557    1   87.2    31.8    0   5.96    0   1.048975    -30.444694
220 5   1.1 0.9;
    3558    1   -0  0   0   2.51    0   1.062152    2.457422    220 5
1.1 0.9;
    3565    2   0   0   0   0   0   1.081614    -26.430835  220 5   1.1
0.9;
    3577    1   -38.7   -12.99  0   13.47383    0   1.031951    -
5.185856   380 5   1.1 0.9;
    3579    1   277.72  7.35    0   3.58    0   1.072032    -39.86741
220 5   1.1 0.9;
    3580    2   0   0   0   0   0   1.07602 -33.404876  220 5   1.1
0.9;
    3589    1   37.54   18.3    0   0.22    0   1.042938    -6.728326
220 5   1.1 0.9;
    3594    1   31.43   6.6 0   3.32    0   1.034276    -19.803995  220
5   1.1 0.9;
    3601    1   0   0   0   0.23    0   1.040409    -21.360272  220 5
1.1 0.9;
    3602    1   86.6    14.9    0   1.34    0   1.032076    -18.933744
220 5   1.1 0.9;
    3608    1   0   -0  0   58.146813   0   1.00943 -41.64982   380 5
1.1 0.9;
    3609    1   -28.13  -0.82   0   0.1 0   1.061834    -11.405533  220
5   1.1 0.9;
    3610    1   185.8   31.8    0   3.73    0   1.03662 -22.744804  220
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0.9;
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    3613    1   152.5   14.4    0   24.61   0   1.03039 -28.045674  380
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    3643    1   24.23   6.4 0   3.9 0   1.033238    -19.364356  220 5
1.1 0.9;
    3645    1   42.55   17.6    0   17.28   0   1.057259    -33.103595
220 5   1.1 0.9;
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1.1 0.9;
    3654    1   20.72   5   0   6.64    0   1.074155    -26.393413  220
5   1.1 0.9;
    3656    2   0   0   0   0   0   1.070983    -11.746409  220 5   1.1
0.9;
    3657    1   131 1.3 0   120.45  0   1.075593    -26.08278   220 5
1.1 0.9;
    3661    2   0   0   0   0   0   1.059676    4.513427    380 5   1.1
0.9;
    3670    1   28.03   6.5 0   6.32    0   1.036121    -21.979516  220
5   1.1 0.9;
    3672    1   82.99   25.9    0   0.23    0   1.032626    -12.873557
220 5   1.1 0.9;
    3674    1   155.05  39.56   0   6.27    0   1.042158    -14.835571
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    3680    1   -0  -0  0   12.4    0   1.035367    -15.507057  220 5
1.1 0.9;
    3697    1   -32.71  -13.76  0   135.136611  0   1.04888 -20.581455
380 5   1.1 0.9;
    3698    2   0   0   0   0   0   1.041813    -24.312887  220 5   1.1
0.9;
    3701    1   -0  0   0   0.43    0   1.048029    -25.022699  220 5
1.1 0.9;
    3707    1   77.49   17.3    0   0.1 0   1.050811    -15.306372  220
5   1.1 0.9;
    3718    1   179.4   58.3    0   0.64    0   1.04576 -25.247909  220
5   1.1 0.9;
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0.9;
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0.9;
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220 5   1.1 0.9;
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    3768    1   19.82   10.9    0   0.05    0   1.042031    -21.905161
220 5   1.1 0.9;
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220 5   1.1 0.9;
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1.1 0.9;
    3793    1   197.7   67.65   0   13.58   0   1.034254    -20.635259
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5   1.1 0.9;
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0.9;
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5   1.1 0.9;
    3817    1   0   -0  0   1.02    0   1.089268    -15.202915  220 5
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    3818    1   44.45   10.9    0   2.23    0   1.042892    -25.785119
220 5   1.1 0.9;
    3825    2   0   0   0   0   0   1.026994    -8.529973   380 5   1.1
0.9;
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1.1 0.9;
    3834    1   160 69.2    0   0.19    0   1.036267    -22.248651  220
5   1.1 0.9;
    3855    1   -38.73  -15.32  0   97.23   0   1.07551 -26.170776  220
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    3857    1   -0  -0  0   11.68   0   1.081278    -23.127573  220 5
1.1 0.9;
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1.1 0.9;
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    3869    2   0   0   0   0   0   1.031907    1.193974    380 5   1.1
0.9;
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0.9;
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220 5   1.1 0.9;
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0.9;
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1.1 0.9;
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1.1 0.9;
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1.1 0.9;
    3916    2   0   0   0   0   0   1.043758    -14.004059  220 5   1.1
0.9;
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380 5   1.1 0.9;
    3919    1   -0  0   0   39.95   0   1.024896    -6.075842   380 5
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    3928    1   105.2   24.2    0   0.25    0   1.046535    -4.757211
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1.1 0.9;
    3951    2   0   0   0   0   0   1.027439    -12.908691  220 5   1.1
0.9;
    3956    1   -0  -0  0   1.18    0   1.049338    -24.08911   220 5
1.1 0.9;
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1.1 0.9;
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0.9;
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5   1.1 0.9;
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    3999    1   110.8   36.9    0   23.2    0   1.051666    -6.639084
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    4000    1   -0  0   0   24.103274   0   0.991622    -15.520854  380
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0.9;
    4025    1   0   0   0   2.67    0   1.035538    -2.7146 220 5   1.1
0.9;
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1.1 0.9;
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220 5   1.1 0.9;
    4039    1   -0  -0  0   1.18    0   1.037985    -22.526852  220 5
1.1 0.9;
    4049    1   -0  -0  0   0.89    0   1.017178    -10.133503  220 5
1.1 0.9;
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1.1 0.9;
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0.9;
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1.1 0.9;
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0.9;
    4100    1   -0  -0  0   1.23    0   1.063607    -10.700214  220 5
1.1 0.9;
    4103    1   81.09   12.5    0   2.4 0   1.037109    -21.700054  220
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0.9;
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0.9;
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380 5   1.1 0.9;
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    4143    1   11.11   4.1 0   0.8 0   1.05009 -1.152786   220 5   1.1
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220 5   1.1 0.9;
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7.552855   380 5   1.1 0.9;
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1.1 0.9;
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1.1 0.9;
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    4245    1   24.93   9.6 0   0.09    0   1.041034    -9.897904   220
5   1.1 0.9;
    4251    1   47.15   15.7    0   5.41    0   1.026731    -17.726744
220 5   1.1 0.9;
    4267    1   70.78   19.6    0   7.9 0   1.038616    -8.918342   220
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    4281    1   -0  -0  0   11.4    0   1.05107 -11.692848  220 5   1.1
0.9;
    4300    1   81.49   25.1    0   0.36    0   1.00381 -16.189999  220
5   1.1 0.9;
    4301    1   -0  -0  0   2.27    0   1.038253    -21.079157  220 5
1.1 0.9;
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0.9;
    4313    1   133.4   29.4    0   10.87   0   1.043554    -21.132272
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1.1 0.9;
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0.9;
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5   1.1 0.9;
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0.9;
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1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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5   1.1 0.9;
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1.1 0.9;
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0.9;
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5   1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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    4683    1   38.84   8.5 0   7.31    0   1.052059    -3.729961   220
5   1.1 0.9;
    4685    1   46.15   11.2    0   10.16   0   1.042999    -25.790941
220 5   1.1 0.9;
    4689    1   109.7   15  0   30.97   0   1.048918    -30.792772  220
5   1.1 0.9;
    4701    2   0   0   0   0   0   1.043063    -9.879302   380 5   1.1
0.9;
    4710    1   195.4   76.84   0   8.59    0   1.026719    -9.176978
220 5   1.1 0.9;
    4711    1   -0  0   0   16.11   0   1.042937    -11.415152  220 5
1.1 0.9;
    4725    1   4.91    1.6 0   4.15    0   1.014202    -10.601951  220
5   1.1 0.9;
    4728    1   3.1 0.1 0   1.34    0   1.040401    -21.360189  220 5
1.1 0.9;
    4729    1   0   0   0   2.38    0   1.032006    -8.433928   220 5
1.1 0.9;
    4734    1   0   0   0   25.339116   0   1.014516    -10.190708  380
5   1.1 0.9;
    4738    1   101.89  25.72   0   5.11    0   1.06866 -10.715961  220
5   1.1 0.9;
    4747    1   93.3    27.8    0   6.1 0   1.035644    -12.325346  220
5   1.1 0.9;
    4748    1   -0  -0  0   1.49    0   1.032136    -12.426948  220 5
1.1 0.9;
    4765    1   33.04   10.1    0   0.43    0   1.03734 -12.246628  220
5   1.1 0.9;
    4783    2   0   0   0   0   0   1.071981    8.277038    220 5   1.1
0.9;
    4787    1   71.98   27.1    0   7.2 0   0.99123 -14.709219  380 5
1.1 0.9;
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    4816    2   0   0   0   0   0   1.067305    -23.812093  220 5   1.1
0.9;
    4819    2   0   0   0   0   0   1.031907    1.213157    380 5   1.1
0.9;
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0.9;
    4826    1   103.6   16  0   11.22   0   1.076968    -24.357644  220
5   1.1 0.9;
    4829    1   171.9   39.1    0   4.23    0   1.020877    -5.66958
220 5   1.1 0.9;
    4831    1   130.4   44.33   0   5.22    0   1.023656    -15.867691
220 5   1.1 0.9;
    4850    2   0   0   0   0   0   1.054975    -13.889155  220 5   1.1
0.9;
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220 5   1.1 0.9;
    4864    1   -28.21  -6  0   0.05    0   1.037977    -12.814047  220
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5   1.1 0.9;
    4880    2   0   0   0   0   0   1.034991    -15.897969  220 5   1.1
0.9;
    4885    1   166.4   50.4    0   1.23    0   1.074189    -26.349591
220 5   1.1 0.9;
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220 5   1.1 0.9;
    4907    1   125.16  29.2    0   2.69    0   1.041821    -13.302552
220 5   1.1 0.9;
    4908    1   50.06   9.9 0   11.56   0   1.037684    -21.273347  220
5   1.1 0.9;
    4914    1   14.91   -8.73   0   34.66   0   1.036628    -22.980806
220 5   1.1 0.9;
    4918    2   0   0   0   0   0   1.057325    -11.046567  220 5   1.1
0.9;
    4925    1   -0  0   0   0.3 0   1.036525    -22.48156   220 5   1.1
0.9;
    4936    1   312.2   28  0   48.6    0   1.049019    -30.699604  220
5   1.1 0.9;
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220 5   1.1 0.9;
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220 5   1.1 0.9;
    4950    1   218.7   -9.1    0   49  0   1.036717    -40.104666  220
5   1.1 0.9;
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0.9;
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5   1.1 0.9;
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    5002    1   -0  0   0   4.34    0   1.071581    -8.674239   220 5
1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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    5099    1   0   0   0   9.34    0   1.058325    1.539585    220 5
1.1 0.9;
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5   1.1 0.9;
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0.9;
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0.9;
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1.1 0.9;
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5   1.1 0.9;
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0.9;
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0.9;
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0.9;
    5213    1   246.8   36.3    0   16.01   0   1.046557    -26.37211
220 5   1.1 0.9;
    5215    1   -0  -0  0   0.89    0   1.029858    -5.840941   220 5
1.1 0.9;
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5   1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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    5340    2   0   0   0   0   0   1.054941    -11.154638  220 5   1.1
0.9;
    5341    1   64.27   17.5    0   0.43    0   1.011142    -21.65338
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    5350    1   0   0   0   28.208233   0   0.981529    -24.398889  380
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0.9;
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0.7;
    5383    1   0   -0  0   24.7    0   1.048549    -24.463345  220 5
1.1 0.9;
    5388    1   159.5   42  0   2.3 0   1.013391    -14.763695  220 5
1.1 0.9;
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1.1 0.9;
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0.9;
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220 5   1.1 0.9;
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1.1 0.9;
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380 5   1.1 0.9;
    5421    1   -0  -0  0   0.92    0   0.998945    -15.122174  380 5
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220 5   1.1 0.9;
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    5460    1   -15.89  -6.42   0   38.657071   0   0.992989    -
17.9255    380 5   1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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1.1 0.9;
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0.9;
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0.9;
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0.9;
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1.1 0.9;
```

```
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1.1 0.9;
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1.1 0.9;
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0.9;
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0.9;
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220 5   1.1 0.9;
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1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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    5935    1   -0  0   0   5.75    0   1.065025    -22.144776  220 5
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0.9;
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0.7;
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0.9;
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0.9;
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0.9;
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1.1 0.9;
    6036    2   0   0   0   0   0   1.043738    -0.899698   380 5   1.1
0.9;
    6041    1   0   0   0   0.53    0   1.072109    -47.920883  220 5
1.1 0.9;
    6053    1   412.1   79.3    0   7.73    0   1.058134    -26.592239
220 5   1.1 0.9;
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    6071    1   163.5   35.6    0   4.59    0   1.035726    -16.340255
220 5   1.1 0.9;
    6101    1   103 40.2    0   1.13    0   1.02679 -10.858615  220 5
1.1 0.9;
    6104    1   93.12   4.99    0   0.18    0   1.056405    -12.076426
220 5   1.1 0.9;
    6110    1   78.59   16  0   1.87    0   1.056871    -35.945281  220
5   1.1 0.9;
    6112    1   45.28   15.27   0   7.88    0   1.024189    -9.306431
220 5   1.1 0.9;
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1.1 0.9;
    6115    1   -0  -0  0   1.18    0   1.02848 -11.273668  220 5   1.1
0.9;
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220 5   1.1 0.9;
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1.1 0.9;
    6151    1   60.67   33.2    0   0.31    0   1.032517    -24.013495
220 5   1.1 0.9;
    6153    2   0   0   0   0   0   0.988112    -14.90068   380 5   1.1
0.9;
    6163    1   0   -0  0   4.96    0   1.036223    -21.959198  220 5
1.1 0.9;
    6168    2   0   0   0   0   0   1.040343    -13.438292  220 5   1.1
0.9;
    6178    1   91  28.4    0   10.57   0   1.040244    -24.602196  220
5   1.1 0.9;
    6194    1   0   -0  0   3.14    0   1.026211    -16.329018  220 5
1.1 0.9;
    6199    1   -4.82   -0.88   0   224.85  0   1.072632    -12.599054
380 5   1.1 0.9;
    6203    1   14.02   5.6 0   2.34    0   1.070264    -27.353716  220
5   1.1 0.9;
    6206    1   -7.62   -2.52   0   33.197994   0   1.037591    0.03956
380 5   1.1 0.9;
    6219    1   -0  -0  0   0.22    0   1.033837    -12.746776  220 5
1.1 0.9;
    6220    1   231.9   27.6    0   0.36    0   1.055297    -22.931727
220 5   1.1 0.9;
    6224    1   0   0   0   58.990785   0   1.000545    -12.907246  380
5   1.1 0.9;
    6231    1   -0  0   0   11.5    0   1.034263    -8.032463   220 5
1.1 0.9;
    6232    1   49.25   12  0   7.28    0   1.042941    -25.794518  220
5   1.1 0.9;
    6240    1   0   -0  0   6.31    0   1.075696    -34.242457  220 5
1.1 0.9;
    6246    1   1769.94 -353.95 0   62.59   0   1.045739    -36.412972
380 5   1.1 0.9;
    6252    1   164.7   44.5    0   3.67    0   1.020382    -29.885564
220 5   1.1 0.9;
    6253    1   128.8   29.3    0   26.74   0   1.04318 -25.753603  220
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    6267    1   91.3    18.1    0   3.05    0   1.041192    -24.394509
220 5   1.1 0.9;
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    6271    1   3.7 2.6 0   4.45    0   1.054472    -20.10439   220 5
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220 5   1.1 0.9;
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0.9;
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1.1 0.9;
    6308    1   0   -0  0   0.05    0   1.044666    -25.545467  220 5
1.1 0.9;
    6313    1   48.95   14.9    0   4.04    0   1.033893    -23.915745
220 5   1.1 0.9;
    6331    2   0   0   0   0   0   1.052181    -0.845895   220 5   1.1
0.9;
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0.9;
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1.1 0.9;
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0.9;
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0.9;
    6371    1   -0  -0  0   0.35    0   1.04624 -0.834636   220 5   1.1
0.9;
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0.9;
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220 5   1.1 0.9;
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220 5   1.1 0.9;
    6405    1   76.48   19.8    0   5.41    0   1.016603    -16.051975
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5   1.1 0.9;
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1.1 0.9;
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0.9;
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1.1 0.9;
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5   1.1 0.9;
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1.1 0.9;
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0.9;
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220 5   1.1 0.9;
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220 5   1.1 0.9;
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0.9;
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0.9;
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220 5   1.1 0.9;
    6552    2   0   0   0   0   0   1.048796    -21.140924  220 5   1.1
0.9;
    6555    1   -37.81  -21.64  0   83.362314   0   1.008884    -
43.693382  380 5   1.1 0.9;
    6556    1   -0  -0  0   4.61    0   1.052054    -12.679594  220 5
1.1 0.9;
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    6616    1   -0  -0  0   3.06    0   1.044855    -15.904052  220 5
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1.1 0.9;
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5   1.1 0.9;
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0.9;
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1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
    6820    2   0   0   0   0   0   1.049557    -6.650937   220 5   1.1
0.9;
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220 5   1.1 0.9;
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0.9;
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0.9;
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220 5   1.1 0.9;
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0.9;
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0.9;
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2.414551    380 5   1.1 0.9;
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32.14614   380 5   1.1 0.9;
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220 5   1.1 0.9;
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1.1 0.9;
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0.9;
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220 5   1.1 0.9;
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5   1.1 0.9;
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0.9;
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0.9;
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0.9;
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1.1 0.9;
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0.9;
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0.9;
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5   1.1 0.9;
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1.1 0.9;
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0.9;
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0.9;
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1.1 0.9;
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220 5   1.1 0.9;
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    7266    1   -0  -0  0   2.12    0   1.032954    -5.485507   220 5
1.1 0.9;
    7267    2   0   0   0   0   0   1.010817    -7.692119   380 5   1.1
0.9;
    7273    1   219.6   36.4    0   17.89   0   1.042886    -24.322652
220 5   1.1 0.9;
    7274    1   54.93   16.5    0   6.75    0   1.040156    -3.899721
220 5   1.1 0.9;
    7282    2   0   0   0   0   0   1.034538    -4.68119    380 5   1.1
0.9;
    7284    1   0   0   0   0   0   1.094644    -0.869931   220 5   1.1
0.9;
    7289    1   0   -0  0   26.5    0   1.054049    -6.174395   220 5
1.1 0.9;
    7309    1   0   -0  0   1.32    0   1.054902    -11.343079  220 5
1.1 0.9;
    7316    1   -0  0   0   0.09    0   1.044717    -7.284069   220 5
1.1 0.9;
    7325    1   0   0   0   0.41    0   1.052061    -12.679657  220 5
1.1 0.9;
    7327    2   0   0   0   0   0   1.043172    -18.073929  220 5   1.1
0.9;
    7328    2   0   0   0   0   0   0.999675    -14.476061  380 5   1.1
0.9;
    7338    1   0   -0  0   2.98    0   1.045891    -14.743514  220 5
1.1 0.9;
    7341    1   37.44   0   0   0.67    0   1.040136    -2.402429   220
5   1.1 0.9;
    7342    1   169 70.8    0   5.23    0   1.018398    -16.108009  220
5   1.1 0.9;
    7351    1   61.67   16.3    0   0.05    0   1.037551    -2.8443 220
5   1.1 0.9;
    7353    1   127.3   26.7    0   7.02    0   0.985936    -22.42059
220 5   1.1 0.9;
    7361    1   -0  -0  0   14.29   0   1.053815    -15.271705  220 5
1.1 0.9;
    7367    1   1.5 0.4 0   0.15    0   1.028631    -18.905659  220 5
1.1 0.9;
    7373    1   0   -0  0   1.81    0   1.071954    -23.60091   220 5
1.1 0.9;
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1.1 0.9;
    7380    1   105.67  0.56    0   18.05   0   0.992016    -14.57117
380 5   1.1 0.9;
    7396    1   -0  0   0   5.68    0   1.019741    -19.557023  220 5
1.1 0.9;
    7422    1   65.67   25.6    0   2.34    0   1.033674    -10.805957
220 5   1.1 0.9;
    7437    1   18.32   5.3 0   7.32    0   1.04383 -25.64578   220 5
1.1 0.9;
    7438    1   121.3   20.7    0   2.39    0   1.035924    -12.727575
220 5   1.1 0.9;
    7464    1   197.65  28.23   0   5.87    0   1.041056    -12.617278
220 5   1.1 0.9;
    7466    2   0   0   0   0   0   1.057257    -34.871885  220 5   1.1
0.9;
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6.279485   380 5   1.1 0.9;
    7473    1   113.44  71.42   0   11.08   0   1.035336    -16.025005
220 5   1.1 0.9;
    7474    2   0   0   0   0   0   1.027108    -14.200631  220 5   1.1
0.9;
    7485    1   44.35   10.8    0   8.72    0   1.042606    -25.826706
220 5   1.1 0.9;
    7491    1   0   -0  0   4.29    0   1.012242    -21.474958  220 5
1.1 0.9;
    7495    2   0   0   0   0   0   1.035256    -15.196734  220 5   1.1
0.9;
    7507    1   4   0.8 0   17.65   0   1.04914 -24.08765   220 5   1.1
0.9;
    7513    1   0   -0  0   38.549494   0   0.993009    -15.030612  380
5   1.1 0.9;
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220 5   1.1 0.9;
    7520    2   0   0   0   0   0   1.037447    -9.123264   380 5   1.1
0.9;
    7522    2   0   0   0   0   0   0.99994 -10.953994  380 5   1.1
0.9;
    7523    1   -0  0   0   2.11    0   1.052161    -0.72038    220 5
1.1 0.9;
    7530    1   0   0   0   31.242294   0   1.046869    -19.820201  380
5   1.1 0.9;
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5   1.1 0.9;
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220 5   1.1 0.9;
    7541    1   346.42  89.04   0   43.55   0   1.054084    -16.465783
380 5   1.1 0.9;
    7571    1   -0  -0  0   13.9    0   1.044943    -13.985525  220 5
1.1 0.9;
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0.9;
    7577    1   0   0   0   6.69    0   1.0481  -10.467484  220 5   1.1
0.9;
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220 5   1.1 0.9;
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0.9;
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1.1 0.9;
    7583    1   5.01    1.8 0   3.68    0   1.04744 -0.936009   220 5
1.1 0.9;
    7599    1   0   -0  0   2.13    0   1.034704    -6.055108   220 5
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5   1.1 0.9;
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220 5   1.1 0.9;
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    7640    1   68.78   35  0   34.52   0   1.033083    -6.005598   380
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    7641    2   0   0   0   0   0   1.051427    -6.243524   220 5   1.1
0.9;
    7647    1   -0  -0  0   0.1 0   1.063763    -20.174055  220 5   1.1
0.9;
    7653    1   33.94   11.4    0   0   0   1.0368  -22.767059  220 5
1.1 0.9;
    7663    1   37.14   2.7 0   2.33    0   1.042204    -11.956017  220
5   1.1 0.9;
    7691    1   0   -0  0   96.48   0   1.026843    -3.944271   380 5
1.1 0.9;
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0.9;
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220 5   1.1 0.9;
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1.1 0.9;
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1.1 0.9;
    7738    1   31.84   9.2 0   5.23    0   1.027755    -21.847912  220
5   1.1 0.9;
    7752    1   524.5   126 0   7.45    0   1.03043 -18.412915  220 5
1.1 0.9;
    7766    1   78.89   25.6    0   1.6 0   1.033279    -12.689648  220
5   1.1 0.9;
    7770    1   207.9   32.36   0   8.31    0   1.031073    -44.333742
220 5   1.1 0.9;
    7772    1   223.6   51.8    0   18.45   0   1.053846    -25.615931
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    7775    1   151.5   7.9 0   5   0   1.054984    -28.678026  220 5
1.1 0.9;
    7776    2   0   0   0   0   0   1.072261    6.181044    380 5   1.3
0.7;
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0.9;
    7797    1   -0  -0  0   2.09    0   1.051084    -24.096828  220 5
1.1 0.9;
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0.9;
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11.417611  380 5   1.1 0.9;
    7840    1   -19.28  29.9    0   1.6 0   1.049049    -2.414341   220
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0.9;
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    7873    1   -20.94  -6.16   0   11.99   0   1.021235    -15.229234
220 5   1.1 0.9;
    7881    1   -0  -0  0   7.99    0   1.055617    -14.956341  220 5
1.1 0.9;
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    7885    1   142.4   20  0   2.42    0   1.037839    -21.110646  220
5   1.1 0.9;
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    7892    1   36.94   11  0   0.52    0   1.053815    -11.294264  220
5   1.1 0.9;
    7895    1   338.7   52.5    0   11.36   0   1.059845    -19.561088
220 5   1.1 0.9;
    7903    1   0   -0  0   7.78    0   1.072768    -41.998744  220 5
1.1 0.9;
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    7913    2   0   0   0   0   0   1.063764    -8.906151   380 5   1.1
0.9;
    7923    1   0   -0  0   0.97    0   1.038632    -22.138858  220 5
1.1 0.9;
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1.1 0.9;
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5   1.1 0.9;
    7945    1   17.92   5.8 0   0.84    0   1.031087    -5.74962    220
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    7955    1   111.6   8.9 0   16.19   0   1.068312    -23.349161  220
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    7967    1   0   -0  0   5.97    0   1.043007    -11.416934  220 5
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220 5   1.1 0.9;
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    7974    1   234 13.1    0   51.03   0   1.033995    -20.055775  220
5   1.1 0.9;
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    7989    1   0   0   0   0.27    0   1.052062    -3.729978   220 5
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    7994    1   11.91   3.3 0   6.84    0   1.015764    -16.263273  220
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    7998    2   0   0   0   0   0   1.048854    4.223749    380 5   1.1
0.9;
    8005    1   -0  -0  0   16.77   0   1.027697    -13.719399  220 5
1.1 0.9;
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1.1 0.9;
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1.1 0.9;
    8043    2   0   0   0   0   0   1.066913    -11.239517  220 5   1.1
0.9;
    8057    1   69.18   9.5 0   3.67    0   1.045952    -8.643584   220
5   1.1 0.9;
    8060    1   0   -0  0   9.54    0   1.05168 -13.395033  220 5   1.1
0.9;
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5   1.1 0.9;
    8107    1   68.18   16.1    0   3.35    0   1.034732    -23.363006
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    8109    2   0   0   0   0   0   1.067387    -21.117921  380 5   1.1
0.9;
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220 5   1.1 0.9;
    8128    1   -0  0   0   8.1 0   1.090736    -9.663123   380 5   1.1
0.9;
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1.1 0.9;
    8158    2   0   0   0   0   0   1.052602    -0.559615   220 5   1.1
0.9;
    8165    1   0   -0  0   2.42    0   1.061504    -3.473077   220 5
1.1 0.9;
    8180    1   291.6   47  0   2.38    0   1.075394    -30.774767  220
5   1.1 0.9;
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1.1 0.9;
    8190    1   0   -0  0   0.32    0   1.048784    -10.298904  220 5
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5   1.1 0.9;
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0.9;
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0.9;
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5   1.1 0.9;
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0.9;
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220 5   1.1 0.9;
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    8307    1   -0  0   0   0.14    0   1.051092    -3.882875   220 5
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1.1 0.9;
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0.9;
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0.9;
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1.1 0.9;
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220 5   1.1 0.9;
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1.1 0.9;
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14.749149  380 5   1.1 0.9;
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18.64268   380 5   1.1 0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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0.9;
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    8546    1   5.01    1.8 0   0.77    0   1.038205    -11.643532  220
5   1.1 0.9;
    8560    1   -0  0   0   1.11    0   0.984498    -18.190495  380 5
1.1 0.9;
    8564    2   0   0   0   0   0   1.019727    -19.556828  220 5   1.1
0.9;
    8568    1   175.7   56.2    0   0.13    0   1.027945    -6.041782
220 5   1.1 0.9;
    8578    1   0   -0  0   4.55    0   1.049043    -21.931929  220 5
1.1 0.9;
    8592    1   -0  0   0   0.43    0   1.051916    -3.764146   220 5
1.1 0.9;
    8626    1   136 36.1    0   6.07    0   0.99463 -17.562106  220 5
1.1 0.9;
    8627    1   -0  0   0   4.26    0   1.048517    -26.395781  220 5
1.1 0.9;
    8628    1   277.1   37  0   21.03   0   1.042001    -23.598682  220
5   1.1 0.9;
```

```
    8636    1   31.43   10.6    0   1.61    0   1.041292    -21.579777
220 5   1.1 0.9;
    8651    1   162.49  45.11   0   5.38    0   1.024808    -17.313776
220 5   1.1 0.9;
    8653    1   44.55   7.5 0   0.6 0   1.036488    -16.021006  220 5
1.1 0.9;
    8656    1   5.51    1.3 0   0.09    0   1.031987    -8.436898   220
5   1.1 0.9;
    8669    1   74.98   10.5    0   12.96   0   1.050943    -15.2714
220 5   1.1 0.9;
    8670    2   0   0   0   0   0   1.049066    -6.522112   220 5   1.1
0.9;
    8672    1   -0  -0  0   28.515005   0   1.023418    -20.934804  380
5   1.1 0.9;
    8676    2   0   0   0   0   0   1.018762    -21.841814  220 5   1.1
0.9;
    8677    1   0   0   0   2.29    0   1.018085    -10.22697   220 5
1.1 0.9;
    8683    2   0   0   0   0   0   1.041975    -24.273671  220 5   1.1
0.9;
    8689    1   42.65   18.2    0   0   0   1.036224    -20.697926  220
5   1.1 0.9;
    8691    1   305.04  77.16   0   17.43   0   1.047013    -33.585967
220 5   1.1 0.9;
    8704    1   180.7   71.8    0   2.46    0   1.039389    -7.999499
220 5   1.1 0.9;
    8707    1   101.9   24.3    0   8.53    0   1.032359    -11.707737
220 5   1.1 0.9;
    8711    1   0   0   0   3.9 0   1.040912    -12.07314   220 5   1.1
0.9;
    8721    2   0   0   0   0   0   1.054052    -15.864679  380 5   1.1
0.9;
    8722    1   -0  0   0   2.13    0   1.072192    -25.045427  220 5
1.1 0.9;
    8732    1   66.27   19.3    0   12.94   0   1.038041    -21.15003
220 5   1.1 0.9;
    8743    1   11.61   7.6 0   6.21    0   1.035613    -34.477305  220
5   1.1 0.9;
    8748    1   279.7   4.6 0   3.77    0   1.067084    -49.622846  220
5   1.1 0.9;
    8763    1   -233.23 29.6    0   207.55  0   1.04005 2.599263    380
5   1.1 0.9;
    8765    1   -0  -0  0   11.69   0   1.051157    -15.257422  220 5
1.1 0.9;
    8787    1   22.83   8   0   3.71    0   1.066984    -16.98525   220
5   1.1 0.9;
    8788    1   143.8   46.45   0   3.26    0   1.046176    -5.977711
220 5   1.1 0.9;
    8791    1   -0  -0  0   0.36    0   1.057978    -22.356166  220 5
1.1 0.9;
    8795    2   0   0   0   0   0   1.054157    -0.136311   220 5   1.1
0.9;
    8804    1   22.02   4.4 0   4.83    0   1.049065    -9.481469   220
5   1.1 0.9;
    8807    2   0   0   0   0   0   1.05109 -3.882868   220 5   1.1
0.9;
```

```
    8808    1   203.6   19.81   0   15.46   0   1.060353    -25.817931
220 5   1.1 0.9;
    8809    1   101.2   -2.9    0   0.51    0   1.029974    -32.515321
220 5   1.1 0.9;
    8818    2   0   0   0   0   0   1.050791    0.636035    220 5   1.1
0.9;
    8825    1   406.04  95.5    0   35.34   0   1.014963    -2.776003
380 5   1.1 0.9;
    8829    1   91.6    27.1    0   10.95   0   1.044583    -21.076938
220 5   1.1 0.9;
    8834    1   -0  0   0   1.52    0   1.003582    -22.536497  220 5
1.1 0.9;
    8835    1   113.7   22.3    0   15.55   0   1.036698    -22.906459
220 5   1.1 0.9;
    8843    1   208.7   63  0   3.45    0   1.054844    -11.164607  220
5   1.1 0.9;
    8846    1   20.82   0   0   0.17    0   1.070172    7.811263    220
5   1.1 0.9;
    8853    1   410.3   91.6    0   13.25   0   1.052314    -36.519464
220 5   1.1 0.9;
    8854    1   69.18   35.1    0   12.59   0   1.027794    -44.429467
220 5   1.1 0.9;
    8860    1   57.16   19.7    0   22.17   0   1.020431    -10.190501
220 5   1.1 0.9;
    8864    1   63.31   -9.8    0   5.36    0   1.048228    -31.670524
220 5   1.1 0.9;
    8872    2   0   0   0   0   0   1.053844    -15.88923   380 5   1.1
0.9;
    8873    1   0   -0  0   1.87    0   1.071142    -27.284425  220 5
1.1 0.9;
    8874    1   285.2   61.4    0   26.04   0   1.046146    -20.00976
220 5   1.1 0.9;
    8877    1   -0  0   0   1.03    0   1.039567    -20.646198  220 5
1.1 0.9;
    8879    1   0   0   0   1.47    0   1.036915    -22.747121  220 5
1.1 0.9;
    8886    1   0   -0  0   -1.392036   0   0.983701    -3.785162   380
5   1.1 0.9;
    8887    1   0   0   0   102.70867   0   1.045962    1.729833    380
5   1.1 0.9;
    8893    1   278.3   33.6    0   25.9    0   1.05128 -15.163258  220
5   1.1 0.9;
    8900    1   3.1 1.6 0   0.09    0   1.047741    -23.703947  220 5
1.1 0.9;
    8903    2   0   0   0   0   0   1.020268    -11.421507  380 5   1.1
0.9;
    8906    1   91  21  0   11.23   0   1.036   -23.062052  220 5   1.1
0.9;
    8913    1   -0  0   0   1.13    0   1.040075    -20.555337  220 5
1.1 0.9;
    8930    1   139.4   21.2    0   6.21    0   0.991658    -18.577239
220 5   1.1 0.9;
    8931    1   -0.56   -0  0   108.21  0   1.090352    -9.661963   380
5   1.1 0.9;
    8947    1   3.7 0.2 0   0.05    0   1.03998 -11.496674  220 5   1.1
0.9;
```

```
    8950    2   0   0   0   0   0   1.047268    -14.839334  220 5   1.1
0.9;
    8961    2   0   0   0   0   0   1.035459    -14.187287  220 5   1.1
0.9;
    8975    1   0   -0  0   11.04   0   1.04225 -24.276259  220 5   1.1
0.9;
    8976    2   0   0   0   0   0   1.046972    -17.074322  220 5   1.1
0.9;
    8980    1   63.97   12.8    0   0.17    0   1.042994    -11.072487
220 5   1.1 0.9;
    8989    1   88.5    24.5    0   2.23    0   1.043398    -25.575347
220 5   1.1 0.9;
    8992    1   -0  -0  0   14.64   0   1.051114    -3.785395   220 5
1.1 0.9;
    8997    2   0   0   0   0   0   0.997131    -13.27089   380 5   1.1
0.9;
    8999    1   41.15   10.3    0   2.41    0   1.044391    -21.558302
220 5   1.1 0.9;
    9002    1   119.02  12.54   0   23.45   0   1.021009    -10.528192
220 5   1.1 0.9;
    9011    1   88.4    25.2    0   12.9    0   1.036275    -23.026084
220 5   1.1 0.9;
    9012    1   25.63   6.5 0   0.52    0   1.048758    1.093286    220
5   1.1 0.9;
    9014    1   70.78   19.6    0   8.1 0   1.051072    -6.681904   220
5   1.1 0.9;
    9018    1   55.46   16.9    0   1.92    0   1.022715    -6.602667
220 5   1.1 0.9;
    9019    1   91.4    18.1    0   4.89    0   1.040421    -24.677298
220 5   1.1 0.9;
    9021    1   152.18  21.63   0   1.91    0   1.035437    -6.308005
220 5   1.1 0.9;
    9033    1   76.88   16.4    0   6.61    0   1.049786    -26.382004
220 5   1.1 0.9;
    9045    1   60.57   18.9    0   1.46    0   1.039905    -24.629587
220 5   1.1 0.9;
    9051    1   0   -0  0   2.15    0   1.036594    0.577238    220 5
1.1 0.9;
    9059    1   0   -0  0   2   0   1.072487    -27.192131  220 5   1.1
0.9;
    9065    1   -0  -0  0   0.59    0   1.040021    2.414524    380 5
1.1 0.9;
    9066    1   23.26   3.01    0   9.29    0   1.019989    -20.806005
220 5   1.1 0.9;
    9067    2   0   0   0   0   0   1.040924    1.549232    220 5   1.1
0.9;
    9091    1   0   0   0   3.65    0   1.038554    -9.767436   220 5
1.1 0.9;
    9101    2   0   0   0   0   0   1.02885 -21.628013  380 5   1.1
0.9;
    9108    2   0   0   0   0   0   1.046626    -16.441009  220 5   1.1
0.9;
    9109    1   0   -0  0   0.31    0   1.036596    0.577218    220 5
1.1 0.9;
    9112    1   0   -0  0   19.71   0   1.047611    -12.93238   220 5
1.1 0.9;
```

```
    9119    1   -0  0   0   1.24    0   1.04289 -20.527494  220 5   1.1
0.9;
    9128    1   50.56   8.7 0   0.19    0   1.042244    -2.676445   220
5   1.1 0.9;
    9130    1   245.51  9.17    0   24.25   0   1.049965    -30.721639
220 5   1.1 0.9;
    9131    1   -0  -0  0   6.62    0   1.051124    -24.097314  220 5
1.1 0.9;
    9137    2   0   0   0   0   0   1.049768    -26.378636  220 5   1.1
0.9;
    9140    2   0   0   0   0   0   1.049624    -5.232971   220 5   1.1
0.9;
    9150    2   0   0   0   0   0   1.037969    -13.200551  380 5   1.1
0.9;
    9155    1   -0  -0  0   5.01    0   1.02382 -20.860292  220 5   1.1
0.9;
    9158    1   54.96   9.42    0   5.92    0   1.025798    -14.56483
220 5   1.1 0.9;
    9164    1   7.71    2.4 0   6.93    0   1.001887    -19.403088  220
5   1.1 0.9;
    9173    1   66.07   15.6    0   5.57    0   1.032906    -20.202148
220 5   1.1 0.9;
    9174    2   0   0   0   0   0   1.03623 -32.377948  380 5   1.1
0.9;
    9176    1   -0  0   0   1.28    0   1.047842    -12.93497   220 5
1.1 0.9;
    9180    2   0   0   0   0   0   1.061189    -8.603491   220 5   1.1
0.9;
    9181    1   2.43    1.35    0   0.1 0   1.032498    -9.466095   220
5   1.1 0.9;
    9185    1   66.97   18.6    0   18.5    0   1.051815    -6.62338
220 5   1.1 0.9;
    9189    1   62.57   -61 0   55.14   0   1.048019    -25.022568  220
5   1.1 0.9;
    9191    1   -0  -0  0   2.34    0   1.073685    -24.80852   220 5
1.1 0.9;
    9203    1   627.36  -73.13  0   27.185221   0   1.001613    -
12.605605  380 5   1.1 0.9;
    9213    1   -0  -0  0   10.210952   0   1.023742    -4.653017   380
5   1.1 0.9;
    9217    1   -0  0   0   6.33    0   1.040155    -8.875709   220 5
1.1 0.9;
    9222    1   -5.15   -2.04   0   154.446402  0   1.053345    -
16.073005  380 5   1.1 0.9;
    9231    1   242.08  59.98   0   5.6 0   1.029833    -19.150137  220
5   1.1 0.9;
    9241    1   0   -0  0   0.36    0   1.049081    -9.481609   220 5
1.1 0.9;
];

%% generator data
%   bus Pg  Qg  Qmax    Qmin    Vg  mBase   status  Pmax    Pmin    Pc1
Pc2 Qc1min  Qc1max  Qc2min  Qc2max  ramp_agc    ramp_10 ramp_30 ramp_q
apf
mpc.gen = [
    124 861.3   56.53   440.32  -172.59 1.081537    100 1   161.3
333.33  0   0   0   0   0   0   0   0   0   0   0;
```

```
    150 67.29   -7.99   77.09   -22.54  1.062805    100 1   160 0   0
0   0   0   0   0   0   0   0   0   0;
    221 -155.39 97.68   183.92  -65.3   0.984682    100 1   100 -207.18
0   0   0   0   0   0   0   0   0   0   0;
    338 83.7    2.5 55.54   -19.16  1.048249    100 1   120 0   0   0
0   0   0   0   0   0   0   0   0;
    352 1250.4  278.94  926.35  -297.68 1.055378    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    413 231 19.11   124.12  -49.84  1.05013 100 1   280 0   0   0   0
0   0   0   0   0   0   0   0;
    453 260.1   57.98   257.23  -74.4   1.018914    100 1   540 0   0
0   0   0   0   0   0   0   0   0;
    516 539.4   190.43  261.79  -106.67 1.075592    100 1   600 200 0
0   0   0   0   0   0   0   0   0   0;
    564 -51.67  -3.31   18.47   -19.35  1.069817    100 1   100 -68.89
0   0   0   0   0   0   0   0   0   0   0;
    583 -270    3.65    17.88   -7.03   1.045397    100 1   100 -360
0   0   0   0   0   0   0   0   0   0   0;
    615 38.2    -0.39   17.09   -7.79   1.063876    100 1   40  0   0
0   0   0   0   0   0   0   0   0   0;
    616 379.2   37.76   217.9   -81.16  1.048713    100 1   480 160 0
0   0   0   0   0   0   0   0   0   0;
    639 -46.2   112.55  135.52  -38.9   1.051376    100 1   100 -61.6
0   0   0   0   0   0   0   0   0   0   0;
    682 37.4    8.53    38.77   -11.06  1.0691  100 1   80  0   0   0
0   0   0   0   0   0   0   0   0;
    749 198.88  -11.17  105.69  -43.84  1.057884    100 1   240 0   0
0   0   0   0   0   0   0   0   0   0;
    757 116.7   13.66   51.3    -23.41  1.017567    100 1   120 0   0
0   0   0   0   0   0   0   0   0   0;
    776 -111.4  3.36    18.16   -6.73   1.026368    100 1   100 -148.53
0   0   0   0   0   0   0   0   0   0   0;
    778 16.5    -0.67   12.37   -9.36   1.049411    100 1   33.58   0
0   0   0   0   0   0   0   0   0   0   0;
    795 58.4    7.75    36.75   -13.04  1.035522    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    803 -89.2   -1.52   74.03   -25.54  1.041369    100 1   100 -118.93
0   0   0   0   0   0   0   0   0   0   0;
    823 1274.2  289.74  926.68  -298.31 1.044097    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    851 59.56   50.82   96.64   -27.81  1.00025 100 1   200 0   0   0
0   0   0   0   0   0   0   0   0;
    858 855.6   147.86  440.67  -172.15 1.031745    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    891 1702.8  651.53  1097.41 -373.91 1.064525    100 0   2400    800
0   0   0   0   0   0   0   0   0   0   0;
    972 1221.2  393.14  934.73  -291.52 1.072621    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    1001    92.1    25.97   55.02   -19.81  1.074143    100 1   120 0
0   0   0   0   0   0   0   0   0   0;
    1002    171 10.89   89.55   -35.15  1.041506    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    1043    829.5   49  387.88  -163.4  1.028946    100 0   900 300 0
0   0   0   0   0   0   0   0   0   0;
    1083    91.8    9.85    54.91   -19.88  1.049472    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
```

```
    1093    837 83.03   550.69  -185.15 1.027056    100 1   1200    400
0   0   0   0   0   0   0   0   0   0   0;
    1100    58.2    5.6 36.8    -13.01  1.042801    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    1102    -124.15 7.32    38.05   -11.59  1.049879    100 1   100 -
165.54 0   0   0   0   0   0   0   0   0   0   0;
    1237    1504.8  364.78  906.61  -319.44 1.108028    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    1251    837 77.94   550.69  -185.15 1.027102    100 0   1200    400
0   0   0   0   0   0   0   0   0   0   0;
    1295    -124.1  4.52    36.92   -12.88  1.03682 100 1   100 -165.47
0   0   0   0   0   0   0   0   0   0   0;
    1341    67.2    29.74   57.03   -17.62  1.032899    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
    1354    -246.5  13.72   38.08   -11.73  1.041045    100 1   100 -
328.67 0   0   0   0   0   0   0   0   0   0   0;
    1422    -101    2.33    18.09   -6.79   1.04353 100 1   100 -134.67
0   0   0   0   0   0   0   0   0   0   0;
    1436    49.4    2.95    37.72   -12.09  1.047684    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    1478    62.6    7.49    36.4    -13.44  1.048068    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    1604    50.6    13.86   37.66   -12.17  1.043862    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    1642    50.4    11.76   37.74   -12.11  1.028554    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    1680    1250.4  274.36  928.89  -296.1  1.04395 100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    1708    860.8   121.94  439.37  -173.3  1.037938    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    1721    28.1    1.73    18.52   -6.39   1.062238    100 1   40  0
0   0   0   0   0   0   0   0   0   0   0;
    1754    40  3.62    16.99   -7.92   1.04286 100 1   41.06   0   0
0   0   0   0   0   0   0   0   0   0;
    1794    1250.4  253.94  926.35  -297.68 1.05295 100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    1808    -0.6    -13.17  111.23  -38.16  1.046224    100 1   100 -
0.8     0   0   0   0   0   0   0   0   0   0   0;
    1851    15.6    -1.26   11.76   -8.89   1.04762 100 1   31.92   0
0   0   0   0   0   0   0   0   0   0   0;
    1852    -241.8  10.63   58.16   -16.52  1.054325    100 1   100 -
322.4   0   0   0   0   0   0   0   0   0   0   0;
    1888    573.68  42.43   396.02  -155.83 1.039377    100 1   912.78
312.78  0   0   0   0   0   0   0   0   0   0   0;
    1914    115.5   -45.22  160.36  -150.95 1.035636    100 1   472.16
39.35   0   0   0   0   0   0   0   0   0   0   0;
    1959    31  0.56    18.14   -6.75   1.064692    100 1   40  0   0
0   0   0   0   0   0   0   0   0   0;
    2035    855.6   149.85  441.85  -171.27 1.03088 100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    2050    836.2   -16.43  962.2   -263.65 1.009914    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    2085    176 31.77   88.39   -36.19  1.040351    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    2177    -121.3  13.33   58.35   -16.26  1.07333 100 1   100 -161.73
0   0   0   0   0   0   0   0   0   0   0;
```

```
    2197    -53.29  -1.42   19.51   -14.74  1.035528    100 1   100 -
71.05  0   0   0   0   0   0   0   0   0   0   0;
    2276    38.9    -22.64  41.67   -36.5   1.05324 100 1   119.3   0
0   0   0   0   0   0   0   0   0   0   0   0;
    2291    110.5   13.69   95.69   -28.93  1.072528    100 1   200 0
0   0   0   0   0   0   0   0   0   0   0   0;
    2359    78.2    7.2 34.35   -15.5   1.024884    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    2421    -320.4  4.66    37.39   -12.45  1.047766    100 1   100 -
427.2  0   0   0   0   0   0   0   0   0   0   0;
    2425    -100.5  5.31    54.3    -20.49  1.041186    100 1   100 -
134    0   0   0   0   0   0   0   0   0   0   0;
    2426    -43.2   -30.65  105.34  -99.02  1.037687    100 1   100 -
57.6   0   0   0   0   0   0   0   0   0   0   0;
    2446    1367    286.48  921.62  -304.73 1.06157 100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    2468    46.8    5.15    38.02   -11.81  1.048132    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0   0;
    2481    31.8    11.5    39.12   -10.71  1.042777    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0   0;
    2489    286.5   -15.8   162.4   -61.79  1.049366    100 1   360 0
0   0   0   0   0   0   0   0   0   0   0   0;
    2550    54.3    4.31    58.23   -16.49  1.049384    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0   0;
    2600    76.48   16.9    76.08   -23.59  1.038821    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0   0;
    2627    1367    302.84  921.52  -304.79 1.061488    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    2653    41.92   3.94    51.94   -22.8   1.036517    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0   0;
    2719    77.6    -15.35  70.15   -58.1   1.035384    100 1   196.72
0   0   0   0   0   0   0   0   0   0   0   0;
    2786    1221.2  372.42  934.81  -291.47 1.073795    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    2797    -95.1   -11.62  88.33   -36.33  1.042226    100 1   100 -
126.8  0   0   0   0   0   0   0   0   0   0   0;
    2799    66.8    -1.21   77.91   -21.66  1.05396 100 1   160 0   0
0   0   0   0   0   0   0   0   0   0   0   0;
    2816    1250.4  270.9   926.26  -297.74 1.053944    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    2841    80.7    -3.29   55.98   -18.76  1.08248 100 1   120 0   0
0   0   0   0   0   0   0   0   0   0   0   0;
    2842    31.6    5.75    18.19   -6.74   1.043712    100 1   40  0
0   0   0   0   0   0   0   0   0   0   0   0;
    2872    4.5 0.33    3.31    -2.54   1.063841    100 1   9.05    0
0   0   0   0   0   0   0   0   0   0   0   0;
    2878    8.95    -11.72  72.95   -68.71  1.057626    100 1   214.86
0   0   0   0   0   0   0   0   0   0   0   0;
    2886    60.9    10.71   57.69   -17.02  1.055151    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0   0;
    2902    20.9    1.11    19.19   -5.72   1.059072    100 1   40  0
0   0   0   0   0   0   0   0   0   0   0   0;
    2930    53.2    2.49    37.24   -12.54  1.047695    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0   0;
    2934    3.4 -0.16   2.51    -1.91   1.051149    100 1   6.83    0
0   0   0   0   0   0   0   0   0   0   0   0;
```

```
    2985    46.6    -69.84  184.46  -132.67 1.053607    100 1   493.35
0   0   0   0   0   0   0   0   0   0   0;
    3018    162.5   -4.77   89.61   -34.82  1.041705    100 1   200 0
0   0   0   0   0   0   0   0   0   0   0;
    3028    855.7   146.13  441.85  -171.27 1.030654    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0;
    3114    38.6    4.12    17.33   -7.61   1.071964    100 1   40  0
0   0   0   0   0   0   0   0   0   0   0;
    3133    85.54   0.39    113.97  -35.56  1.065372    100 1   240 0
0   0   0   0   0   0   0   0   0   0   0;
    3134    -136.3  -11.71  70.25   -29.33  1.023117    100 1   100 -
181.73 0    0   0   0   0   0   0   0   0   0   0;
    3183    98.7    -3.57   53.7    -20.98  1.055515    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
    3205    416.7   119.72  243.61  -88.46  1.041982    100 1   540 0
0   0   0   0   0   0   0   0   0   0   0;
    3218    -107.4  4.44    36.79   -13 1.028507    100 1   100 -143.2
0   0   0   0   0   0   0   0   0   0   0;
    3240    -42.3   -25.61  62.23   -51.37  1.050305    100 1   100 -
56.4    0   0   0   0   0   0   0   0   0   0   0   0;
    3306    861.3   143.67  439.2   -173.43 1.071978    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    3324    -26.48  12.72   38.13   -11.64  1.014126    100 1   100 -
35.3    0   0   0   0   0   0   0   0   0   0   0;
    3346    56.8    11.49   37.1    -12.76  1.01594 100 1   80  0   0
0   0   0   0   0   0   0   0   0   0   0;
    3353    19.07   5.42    38.2    -11.61  1.045739    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    3364    44.5    -21.96  47.19   -41.44  1.0538  100 1   135.27  0
0   0   0   0   0   0   0   0   0   0   0;
    3390    2.4 12.68   54.59   -20.19  1.039984    100 1   120 0   0
0   0   0   0   0   0   0   0   0   0   0;
    3422    53.7    -3.24   58.19   -16.5   1.063657    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
    3436    521 217.43  550.97  -184.89 1.060777    100 0   1200    400
0   0   0   0   0   0   0   0   0   0   0;
    3492    -370.8  2.02    53.75   -21.08  1.04852 100 1   100 -494.4
0   0   0   0   0   0   0   0   0   0   0;
    3513    829.8   51  387.88  -163.4  1.028771    100 1   900 300 0
0   0   0   0   0   0   0   0   0   0   0;
    3565    15.88   2.27    38.83   -10.97  1.081614    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    3580    539 189.12  261.7   -107.36 1.07602 100 1   600 0   0   0
0   0   0   0   0   0   0   0   0;
    3611    -125.4  3.51    54.59   -20.12  1.03905 100 1   100 -167.2
0   0   0   0   0   0   0   0   0   0   0;
    3656    -26.2   12.26   116.07  -33.32  1.070983    100 1   100 -
34.93   0   0   0   0   0   0   0   0   0   0   0;
    3661    861.2   118.75  441.04  -172.05 1.059676    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    3698    -12.58  3.09    36.34   -13.47  1.041813    100 1   100 -
16.78   0   0   0   0   0   0   0   0   0   0   0;
    3741    854.7   190.06  548.57  -187.16 1.031629    100 1   1200
400 0   0   0   0   0   0   0   0   0   0   0;
    3809    257 122.15  313.01  -116.73 1.084785    100 0   700 233.33
0   0   0   0   0   0   0   0   0   0   0;
```

```
    3825    837.3   54.8    388.17  -163.4  1.026994    100 1   900 300
0   0   0   0   0   0   0   0   0   0   0;
    3869    855.6   148.23  440.69  -172.14 1.031907    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    3876    -25.1   6.45    34.27   -15.52  1.044501    100 1   100 -
33.47   0   0   0   0   0   0   0   0   0   0   0;
    3916    -21.27  11.22   38.02   -11.77  1.043758    100 1   100 -
28.37   0   0   0   0   0   0   0   0   0   0   0;
    3951    -27.1   -74.05  126.16  -127.56 1.027439    100 1   100 -
36.13   0   0   0   0   0   0   0   0   0   0   0;
    3971    -134.5  9.64    55.67   -19.09  1.063145    100 1   100 -
179.33 0    0   0   0   0   0   0   0   0   0   0;
    4024    89.5    40.38   97.07   -27.44  1.040328    100 1   200 0
0   0   0   0   0   0   0   0   0   0   0   0;
    4056    -76.9   3.73    38.05   -11.77  1.038526    100 1   100 -
102.53 0    0   0   0   0   0   0   0   0   0   0;
    4084    366.1   46.44   264.94  -103.74 1.063234    100 1   600 0
0   0   0   0   0   0   0   0   0   0   0   0;
    4118    41  5.09    38.37   -11.4   1.027195    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    4125    59.6    16.3    36.89   -13 1.003502    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    4128    67.5    24.27   57.03   -17.63  1.019761    100 1   120 0
0   0   0   0   0   0   0   0   0   0;
    4231    2641.24 771.6   99999   -99999  1.049182    100 0   4188.95
1333.33 0   0   0   0   0   0   0   0   0   0   0;
    4331    60.2    6.92    36.73   -13.12  1.028646    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0   0;
    4395    -129.1  6.73    38.48   -11.33  1.039834    100 1   100 -
172.13 0    0   0   0   0   0   0   0   0   0   0;
    4419    861.3   121.55  441.04  -172.05 1.059565    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    4480    861.3   143.79  439.2   -173.43 1.071852    100 0   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    4482    35.2    13.53   38.85   -10.95  1.049914    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0   0;
    4506    -171.8  12.84   37.86   -11.95  1.036047    100 1   100 -
229.07 0    0   0   0   0   0   0   0   0   0   0;
    4566    -30.39  6.81    37.94   -11.87  1.073282    100 1   100 -
40.51   0   0   0   0   0   0   0   0   0   0   0;
    4624    68  8.25    35.62   -14.19  1.042135    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0   0;
    4661    -78.9   2.19    19.14   -5.77   1.049813    100 1   100 -
105.2   0   0   0   0   0   0   0   0   0   0   0;
    4701    93.2    -41.31  98.4    -86.29  1.043063    100 1   281.85
0   0   0   0   0   0   0   0   0   0   0   0;
    4783    861.3   141.62  439.2   -173.43 1.071981    100 0   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    4816    -26.08  10.07   38.37   -11.44  1.067305    100 1   100 -
34.77   0   0   0   0   0   0   0   0   0   0   0;
    4819    855.6   150.1   440.69  -172.14 1.031907    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    4823    10.3    1.59    4.44    -2.07   1.067114    100 1   10.46
0   0   0   0   0   0   0   0   0   0   0   0;
    4850    88.8    11.86   76.52   -23.19  1.054975    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0;
```

```
    4880    -40.3   5.06    75.62   -23.96  1.034991    100 1   100 -
53.73  0    0   0   0   0   0   0   0   0   0   0;
    4918    41.69   8.64    37.27   -12.57  1.057325    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    4952    -12.57  4.47    37.23   -12.61  1.045386    100 1   100 -
16.77  0    0   0   0   0   0   0   0   0   0   0;
    5004    54.3    4.85    74.73   -70.41  1.0663  100 1   220.12  0
0   0   0   0   0   0   0   0   0   0   0;
    5019    49.4    2.95    37.72   -12.09  1.047693    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    5051    83.48   -1.38   74.55   -24.97  1.037373    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0;
    5067    542 142.39  258.91  -109.58 1.021924    100 1   600 0   0
0   0   0   0   0   0   0   0   0   0   0;
    5110    -52.51  8.27    38.28   -11.5   1.032061    100 1   100 -
70.01  0    0   0   0   0   0   0   0   0   0   0;
    5120    75.6    -5.04   56.35   -18.42  1.055539    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
    5144    1713.6  139.22  882.86  -343.24 1.035201    100 0   2000
666.67  0    0   0   0   0   0   0   0   0   0   0;
    5237    106.8   10.9    75.02   -24.74  1.052719    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0;
    5278    119.4   -0.06   51.3    -23.49  1.042037    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
    5340    -159    11.05   36.37   -13.43  1.054941    100 1   100 -
212    0    0   0   0   0   0   0   0   0   0   0;
    5365    19.59   1.13    18.14   -6.75   1.061754    100 1   40  0
0   0   0   0   0   0   0   0   0   0   0;
    5379    1250.6  358.22  926.47  -297.63 1.107976    100 0   2000
666.67  0    0   0   0   0   0   0   0   0   0   0;
    5395    -395.8  3.01    58.06   -16.66  1.048137    100 1   100 -
527.73 0    0   0   0   0   0   0   0   0   0   0;
    5461    43.4    10.92   38.26   -11.55  1.06213 100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    5481    1368.6  146.68  920.31  -305.64 1.063711    100 0   2000
666.67  0    0   0   0   0   0   0   0   0   0   0;
    5482    56.8    -22.21  101.32  -48.12  1.044486    100 1   249.06
0   0   0   0   0   0   0   0   0   0   0;
    5486    861.3   119.59  441.04  -172.05 1.059636    100 1   1000
333.33  0    0   0   0   0   0   0   0   0   0   0;
    5488    -96.4   14.63   37.49   -12.33  1.041881    100 1   100 -
128.53 0    0   0   0   0   0   0   0   0   0   0;
    5490    3424.8  295.7   1765.36 -686.67 1.068845    100 1   4000
1333.33 0    0   0   0   0   0   0   0   0   0   0;
    5533    173 14.6    88.87   -35.71  1.038212    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    5546    21.5    1.97    19.16   -5.75   1.05378 100 1   40  0   0
0   0   0   0   0   0   0   0   0   0;
    5564    57.6    11.81   36.8    -12.99  1.04123 100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    5658    229.8   77.84   103.18  -46.25  1.017689    100 1   240 0
0   0   0   0   0   0   0   0   0   0   0;
    5664    128 14.87   72.71   -27.05  1.070507    100 1   160 0   0
0   0   0   0   0   0   0   0   0   0;
    5709    837 75.6    550.69  -185.15 1.027078    100 1   1200    400
0   0   0   0   0   0   0   0   0   0   0;
```

```
    5781    1102.83 396.26  779.29  -324.79 1.0396  100 0   1800    600
0   0   0   0   0   0   0   0   0   0   0;
    5814    181.2   41.72   196.98  -77.17  1.044051    100 1   440
146.67  0   0   0   0   0   0   0   0   0   0;
    5856    305.7   19.99   214.13  -85 1.038417    100 1   480 160 0
0   0   0   0   0   0   0   0   0   0;
    5881    60  7.13    36.72   -13.13  1.065605    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    5940    -74.9   4.51    17.21   -7.73   1.030075    100 1   100 -
99.87  0   0   0   0   0   0   0   0   0   0   0;
    5971    1221.2  370.23  934.54  -291.64 1.070056    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    5983    -102.5  3.55    37.27   -12.59  1.066029    100 1   100 -
136.67 0   0   0   0   0   0   0   0   0   0   0;
    5994    -87.3   -16.58  60.51   -61.08  1.029184    100 1   100 -
116.4  0   0   0   0   0   0   0   0   0   0   0;
    6036    820.2   300.86  390.4   -161.16 1.043738    100 0   900 300
0   0   0   0   0   0   0   0   0   0   0;
    6153    94.3    -78.07  249.65  -261.82 0.988112    100 1   769.94
32.08   0   0   0   0   0   0   0   0   0   0   0;
    6168    26.3    0.4 19.86   -14.93  1.040343    100 1   53.76   0
0   0   0   0   0   0   0   0   0   0   0;
    6291    55.5    24.55   58.12   -16.6   1.040598    100 1   120 0
0   0   0   0   0   0   0   0   0   0;
    6331    48.8    5.01    37.76   -12.05  1.052181    100 1   80  0
0   0   0   0   0   0   0   0   0   0;
    6332    96  -9.58   96.56   -27.95  1.062214    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    6351    22.08   14.99   38.29   -11.56  1.064446    100 1   80  0
0   0   0   0   0   0   0   0   0   0;
    6368    -145.3  3   51.11   -23.46  1.043835    100 1   100 -193.73
0   0   0   0   0   0   0   0   0   0   0;
    6376    -27.8   -23.17  148.65  -50.73  1.046714    100 1   100 -
37.07  0   0   0   0   0   0   0   0   0   0   0;
    6429    171 18.2    88.83   -35.69  1.039574    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0   0;
    6474    718.5   -12.86  438.72  -174.15 1.06557 100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    6516    228.2   12.73   126.73  -47.83  1.052452    100 1   280 0
0   0   0   0   0   0   0   0   0   0   0;
    6552    -204.2  5.93    37.58   -12.16  1.048796    100 1   100 -
272.27 0   0   0   0   0   0   0   0   0   0   0;
    6734    382.7   -77.78  311.52  -132.09 1.061492    100 1   720 0
0   0   0   0   0   0   0   0   0   0   0;
    6807    44.07   31.99   77.14   -22.46  1.006037    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0;
    6816    16.53   -8.62   77.35   -22.26  1.053803    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0;
    6820    15.9    -0.62   11.99   -9.06   1.049557    100 1   32.53
0   0   0   0   0   0   0   0   0   0   0;
    6831    -57.5   4.01    35.62   -14.25  1.031347    100 1   100 -
76.67  0   0   0   0   0   0   0   0   0   0   0;
    6845    102.9   17.09   53.24   -21.47  1.055216    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0;
    6852    -344.9  1.84    18.56   -6.34   1.031296    100 1   100 -
459.87 0   0   0   0   0   0   0   0   0   0   0;
```

```
    6857    2463.6  391.48  1865.83 -585.95 1.021411    100 0   4000
1333.33 0   0   0   0   0   0   0   0   0   0;
    6888    133 6.97    189.31  -59.87  1.039234    100 1   300 88.67
0   0   0   0   0   0   0   0   0   0   0;
    6947    227.5   5.93    126.09  -48.29  1.051367    100 1   280 0
0   0   0   0   0   0   0   0   0   0   0;
    6969    39.8    -1.81   38.53   -11.27  1.059486    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0;
    6982    -12.6   9.53    56.22   -18.44  1.036531    100 1   100 -
16.8   0   0   0   0   0   0   0   0   0   0   0;
    7036    65.8    11.07   36.16   -13.72  1.041241    100 1   80  0
0   0   0   0   0   0   0   0   0   0   0   0;
    7049    55.5    16.47   58.18   -16.56  1.049669    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0   0;
    7056    448.85  137.55  267.36  -100.98 1.006597    100 1   600 200
0   0   0   0   0   0   0   0   0   0   0   0;
    7115    65.87   13.66   95.06   -83.34  1.008722    100 1   272.28
0   0   0   0   0   0   0   0   0   0   0   0;
    7159    861.3   121.21  441.04  -172.05 1.059575    100 0   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    7183    1250.6  358.08  926.47  -297.63 1.107733    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    7209    7.3 0.36    3.12    -1.46   1.051113    100 1   7.35    0
0   0   0   0   0   0   0   0   0   0   0   0;
    7267    -39.7   22.41   89.84   -34.84  1.010817    100 1   100 -
52.93  0   0   0   0   0   0   0   0   0   0   0;
    7282    2340.4  94.47   1862.29 -588.16 1.034538    100 1   4000
1333.33 0   0   0   0   0   0   0   0   0   0   0;
    7327    59.06   19.56   76.11   -23.62  1.043172    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0   0;
    7328    53  24.18   37.45   -12.39  0.999675    100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    7466    -202.53 33.59   75.85   -77.06  1.057257    100 1   100 -
270.04 0   0   0   0   0   0   0   0   0   0   0;
    7474    76.5    8.44    56.27   -18.41  1.027108    100 1   120 0
0   0   0   0   0   0   0   0   0   0   0   0;
    7495    75.8    67.52   214.23  -59.77  1.035256    100 1   200
50.53   0   0   0   0   0   0   0   0   0   0   0;
    7520    702.4   277.3   350.36  -140.73 1.037447    100 1   800
266.67  0   0   0   0   0   0   0   0   0   0   0;
    7522    508 235.59  371.11  -119.67 0.99994 100 1   800 266.67  0
0   0   0   0   0   0   0   0   0   0   0;
    7641    769.2   22.2    378.21  -162.35 1.051427    100 1   880 200
0   0   0   0   0   0   0   0   0   0   0   0;
    7697    228.2   12.72   126.73  -47.83  1.052424    100 1   280 0
0   0   0   0   0   0   0   0   0   0   0   0;
    7776    1221.2  354.58  934.73  -291.52 1.072261    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    7808    1250.4  279.8   926.35  -297.68 1.054562    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    7842    165 23.34   90.08   -34.56  1.001912    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    7913    1368.6  146.28  920.41  -305.58 1.063764    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    7998    811.8   175.43  391.57  -160.95 1.048854    100 1   900 300
0   0   0   0   0   0   0   0   0   0   0;
```

```
    8043    -27 4.11    75.67   -23.96  1.066913    100 1   100 -36 0
0   0   0   0   0   0   0   0   0   0;
    8109    992 864.28  99999   -99999  1.067387    100 1   1041.6  0
0   0   0   0   0   0   0   0   0   0;
    8158    153 -2.71   91.67   -33.01  1.052602    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    8222    66.8    17.58   35.76   -14.05  1.02335 100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    8225    17  6.35    19.49   -5.42   1.071504    100 1   40  0   0
0   0   0   0   0   0   0   0   0   0;
    8267    203.4   -3.04   106.84  -42.56  1.043326    100 1   240 0
0   0   0   0   0   0   0   0   0   0;
    8311    -8.75   3.43    17.8    -7.13   1.035451    100 1   100 -
11.66  0   0   0   0   0   0   0   0   0   0   0;
    8312    1702.2  433.08  1096.33 -374.64 1.07814 100 1   2400    800
0   0   0   0   0   0   0   0   0   0   0;
    8458    517.1   -58.18  474.42  -138.49 1.042925    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0   0;
    8473    -135    -7.13   90.21   -34.45  1.039202    100 1   100 -
180    0   0   0   0   0   0   0   0   0   0   0;
    8486    78.8    9.58    34.16   -15.67  1.04752 100 1   80  0   0
0   0   0   0   0   0   0   0   0   0;
    8515    32.3    -18.17  93.03   -31.43  1.053872    100 1   200 0
0   0   0   0   0   0   0   0   0   0;
    8522    -75.69  1.02    3.61    -1.69   1.019671    100 1   100 -
100.92 0   0   0   0   0   0   0   0   0   0   0;
    8564    -65 20.7    51.91   -22.86  1.019727    100 1   100 -86.67
0   0   0   0   0   0   0   0   0   0   0;
    8670    -138.3  10.82   37.4    -12.46  1.049066    100 1   100 -
184.4  0   0   0   0   0   0   0   0   0   0   0;
    8676    -259.1  12.69   34.92   -14.96  1.018762    100 1   100 -
345.47 0   0   0   0   0   0   0   0   0   0   0;
    8683    -37.28  0.32    54.32   -20.39  1.041975    100 1   100 -
49.7   0   0   0   0   0   0   0   0   0   0   0;
    8721    1232.6  152.55  932.68  -293.14 1.054052    100 0   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    8795    166.2   -6.14   111.7   -37.85  1.054157    100 1   240 0
0   0   0   0   0   0   0   0   0   0   0;
    8807    -304    3.53    35.84   -14.07  1.05109 100 1   100 -405.33
0   0   0   0   0   0   0   0   0   0   0;
    8818    44.66   -2.57   76.87   -22.75  1.050791    100 1   160 0
0   0   0   0   0   0   0   0   0   0   0;
    8872    1232.6  140.05  932.68  -293.14 1.053844    100 1   2000
666.67  0   0   0   0   0   0   0   0   0   0   0;
    8903    17  -1.08   28.99   -28.41  1.020268    100 1   86.73   0
0   0   0   0   0   0   0   0   0   0   0;
    8950    -255.7  7.67    38.23   -11.61  1.047268    100 1   100 -
340.94 0   0   0   0   0   0   0   0   0   0   0;
    8961    -61.8   -11.18  53.52   -50.38  1.035459    100 1   100 -
82.4   0   0   0   0   0   0   0   0   0   0   0;
    8976    110 15.22   95.65   -28.95  1.046972    100 1   200 0   0
0   0   0   0   0   0   0   0   0   0;
    8997    78.2    -5.23   107.59  -101.48 0.997131    100 1   317.09
0   0   0   0   0   0   0   0   0   0   0;
    9067    369.6   48.34   198.07  -76.34  1.040924    100 1   440
146.67  0   0   0   0   0   0   0   0   0   0   0;
```

```
    9101    698.8   0.54    442.99  -169.92 1.02885 100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0;
    9108    -239.23 -1.6    18.65   -14.16  1.046626    100 1   100 -
318.97 0   0   0   0   0   0   0   0   0   0;
    9137    42.7    18.81   335.96  -93.23  1.049768    100 1   100
28.47   0   0   0   0   0   0   0   0   0   0;
    9140    -37.2   28.17   73.19   -26.48  1.049624    100 1   100 -
49.6   0   0   0   0   0   0   0   0   0   0;
    9150    860.8   117.32  439.38  -173.28 1.037969    100 1   1000
333.33  0   0   0   0   0   0   0   0   0   0;
    9174    -331.4  142.7   175 -49.16  1.03623 100 1   100 -441.87 0
0   0   0   0   0   0   0   0   0   0;
    9180    72  7.71    77.69   -21.97  1.061189    100 1   160 0   0
0   0   0   0   0   0   0   0   0   0;
];

%% branch data
%   fbus    tbus    r   x   b   rateA   rateB   rateC   ratio   angle
status  angmin  angmax
mpc.branch = [
    7351    5441    0.00018 0.000781    0   0   0   0   0   0   1   -
360    360;
    4314    7571    0.002961    0.01669 0   319 0   0   0   0   1   -
360    360;
    5803    3916    0.00056 0.00432 0   0   0   0   0   0   1   -360
360;
    6757    6036    0.0002  0.00246 0   657 0   0   0   0   1   -360
360;
    6757    6921    0.0003  0.00377 0   1315    0   0   0   0   1   -
360    360;
    5019    9112    0.00014 0.00057 0   0   0   0   0   0   1   -360
360;
    2930    9112    0.00013 0.000729    0   0   0   0   0   0   1   -
360    360;
    1436    9112    0.00012 0.000581    0   0   0   0   0   0   1   -
360    360;
    1851    9112    0.00011 0.00064 0   0   0   0   0   0   1   -360
360;
    8331    9112    0.00019 0.00056 0   0   0   0   0   0   1   -360
360;
    6220    8791    0.00062 0.004909    0   529 0   0   0   0   1   -
360    360;
    9203    7842    7e-05   0.00076 0   887 0   0   0   0   1   -360
360;
    9203    8997    0.00066 0.00622 0   1611    0   0   0   0   1   -
360    360;
    9203    2129    0.00054 0.00752 0   0   0   0   0   0   1   -360
360;
    9203    29  0.00105 0.00877 0   1315    0   0   0   0   1   -360
360;
    118 8903    8e-05   0.00091 0   657 0   0   0   0   1   -360
360;
    118 4598    0.00056 0.00719 0   953 0   0   0   0   1   -360
360;
    2426    5533    0.000531    0.002039    0   319 0   0   0   0   1
-360    360;
```

```
    2426    4831    0.008659    0.03769 0   300 0   0   0   0   1   -
360    360;
    2426    8961    0.003849    0.021099    0   0   0   0   0   0   1
-360    360;
    2426    8522    0.00688 0.035969    0   300 0   0   0   0   1   -
360    360;
    2426    6888    0.006729    0.03713 0   0   0   0   0   0   1   -
360    360;
    2426    3401    0.00111 0.006651    0   414 0   0   0   0   1   -
360    360;
    2426    641 0.0023  0.008909    0   0   0   0   0   0   1   -360
360;
    2426    2600    0.000841    0.00313 0   0   0   0   0   0   1   -
360    360;
    2426    5351    0.003521    0.017479    0   300 0   0   0   0   1
-360    360;
    3051    718 3.9e-05 0.00025 0   510 0   0   0   0   1   -360
360;
    3036    2327    0.000159    0.000729    0   357 0   0   0   0   1
-360    360;
    8651    7473    0.005281    0.032099    0   395 0   0   0   0   1
-360    360;
    8651    7473    0.005651    0.029419    0   376 0   0   0   0   1
-360    360;
    903 3654    0.000271    0.00036 0   0   0   0   0   0   1   -360
360;
    8732    7050    0.00044 0.00143 0   472 0   0   0   0   1   -360
360;
    8732    3912    0.000159    0.00074 0   453 0   0   0   0   1   -
360    360;
    2273    1973    0.00019 0.000591    0   338 0   0   0   0   1   -
360    360;
    5131    2928    0.00019 0.00087 0   0   0   0   0   0   1   -360
360;
    6629    4918    0.002591    0.013659    0   319 0   0   0   0   1
-360    360;
    6629    7309    0.00305 0.01168 0   0   0   0   0   0   1   -360
360;
    413 1102    0.000159    0.000599    0   433 0   0   0   0   1   -
360    360;
    413 1102    0.000159    0.00062 0   395 0   0   0   0   1   -360
360;
    3248    4918    0.00101 0.004229    0   472 0   0   0   0   1   -
360    360;
    3248    4281    0.00319 0.018651    0   453 0   0   0   0   1   -
360    360;
    3248    7309    0.000729    0.00337 0   0   0   0   0   0   1   -
360    360;
    1146    1187    0.002961    0.012831    0   281 0   0   0   0   1
-360    360;
    1146    7945    0.000591    0.00339 0   0   0   0   0   0   1   -
360    360;
    8900    2421    0.00024 0.001219    0   0   0   0   0   0   1   -
360    360;
    6071    2972    0.006219    0.036341    0   376 0   0   0   0   1
-360    360;
```

```
    6071    6031    0.001841    0.01193 0   472 0   0   0   0   1   -
360    360;
    3293    7264    0.001409    0.01113 0   414 0   0   0   0   1   -
360    360;
    3293    283 0.00151 0.00768 0   376 0   0   0   0   1   -360
360;
    3293    3069    0.00599 0.03313 0   395 0   0   0   0   1   -360
360;
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-360    360;
    4689    4936    0.00074 0.00311 0   0   0   0   0   0   1   -360
360;
    4689    4936    0.000729    0.003159    0   0   0   0   0   0   1
-360    360;
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360    360;
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360    360;
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360;
    6806    5410    0.00055 0.003961    0   395 0   0   0   0   1   -
360    360;
    6806    5410    0.00055 0.003729    0   338 0   0   0   0   1   -
360    360;
    6806    1609    0.00107 0.007789    0   414 0   0   0   0   1   -
360    360;
    6806    1609    0.00112 0.00775 0   472 0   0   0   0   1   -360
360;
    6806    1609    0.001031    0.00775 0   0   0   0   0   0   1   -
360    360;
    6806    2438    0.00062 0.003219    0   0   0   0   0   0   1   -
360    360;
    6806    954 0.00068 0.002659    0   414 0   0   0   0   1   -360
360;
    9140    502 0.00193 0.012479    0   491 0   0   0   0   1   -360
360;
    9140    3013    0.001159    0.007229    0   0   0   0   0   0   1
-360    360;
    9140    2949    0.00137 0.008729    0   395 0   0   0   0   1   -
360    360;
    9140    2949    0.001401    0.00855 0   433 0   0   0   0   1   -
360    360;
    9140    2949    0.001331    0.008521    0   433 0   0   0   0   1
-360    360;
    7070    2208    0.00031 0.00081 0   281 0   0   0   0   1   -360
360;
    7070    8060    0.000341    0.00119 0   281 0   0   0   0   1   -
360    360;
    7070    4484    0.00031 0.001281    0   376 0   0   0   0   1   -
360    360;
    7070    4239    0.00094 0.0035  0   433 0   0   0   0   1   -360
360;
    8535    7047    7e-05   0.000651    0   0   0   0   0   0   1   -
360    360;
    5477    3657    0.00019 0.00124 0   491 0   0   0   0   1   -360
360;
```

```
    5477    2928    0.000331    0.002539    0   433 0   0   0   0   1
-360    360;
    3145    2918    0.0016  0.02113 0   0   0   0   0   0   1   -360
360;
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-360    360;
    7770    5317    0.00088 0.004969    0   319 0   0   0   0   1   -
360    360;
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360;
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360;
    7267    2938    0.00059 0.00802 0   723 0   0   0   0   1   -360
360;
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360;
    7267    3918    0.00171 0.02128 0   986 0   0   0   0   1   -360
360;
    7267    3918    0.00174 0.02084 0   854 0   0   0   0   1   -360
360;
    7267    6581    0.00086 0.01433 0   1151    0   0   0   0   1   -
360    360;
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360;
    7267    3830    0.00126 0.01447 0   1118    0   0   0   0   1   -
360    360;
    7267    5648    0.00122 0.01509 0   1052    0   0   0   0   1   -
360    360;
    7267    5648    0.00154 0.019   0   1282    0   0   0   0   1   -
360    360;
    4918    4907    0.00474 0.03564 0   472 0   0   0   0   1   -360
360;
    4918    5957    0.006   0.047849    0   433 0   0   0   0   1   -
360    360;
    4918    5233    0.008039    0.03375 0   281 0   0   0   0   1   -
360    360;
    6854    7309    2.1e-05 0.000211    0   510 0   0   0   0   1   -
360    360;
    8311    3680    0.00045 0.002341    0   0   0   0   0   0   1   -
360    360;
    2770    8804    0.000669    0.004281    0   433 0   0   0   0   1
-360    360;
    9241    8804    0.00068 0.00419 0   0   0   0   0   0   1   -360
360;
    3083    7124    0.000729    0.00431 0   510 0   0   0   0   1   -
360    360;
    3083    7124    0.000591    0.004651    0   453 0   0   0   0   1
-360    360;
    3083    8873    0.00099 0.005081    0   338 0   0   0   0   1   -
360    360;
    1566    7582    0.00212 0.013031    0   0   0   0   0   0   1   -
360    360;
    1566    3541    0.002159    0.01275 0   0   0   0   0   0   1   -
360    360;
    8683    3698    0.00025 0.00095 0   0   0   0   0   0   1   -360
360;
```

```
    8683    3698    0.000271    0.00089 0   0   0   0   0   0   1   -
360    360;
    8683    2801    0.001961    0.012409    0   281 0   0   0   0   1
-360    360;
    8683    8328    0.00044 0.00207 0   472 0   0   0   0   1   -360
360;
    8683    8511    0.000469    0.00143 0   529 0   0   0   0   1   -
360    360;
    8683    6570    0.001271    0.01406 0   529 0   0   0   0   1   -
360    360;
    8683    6570    0.00124 0.013021    0   529 0   0   0   0   1   -
360    360;
    8683    8975    0.000409    0.00239 0   0   0   0   0   0   1   -
360    360;
    8683    216 0.00094 0.005   0   338 0   0   0   0   1   -360
360;
    8683    2961    0.000219    0.0007  0   529 0   0   0   0   1   -
360    360;
    8683    6773    6e-05   0.00025 0   0   0   0   0   0   1   -360
360;
    8683    5278    5e-05   0.000229    0   0   0   0   0   0   1   -
360    360;
    3768    2751    0.00019 0.000909    0   0   0   0   0   0   1   -
360    360;
    2276    5546    0.001711    0.00782 0   0   0   0   0   0   1   -
360    360;
    2276    6816    0.002651    0.01176 0   319 0   0   0   0   1   -
360    360;
    7766    444 0.001409    0.010599    0   0   0   0   0   0   1   -
360    360;
    7766    5334    0.001419    0.010219    0   0   0   0   0   0   1
-360    360;
    839 3918    0.00013 0.00212 0   756 0   0   0   0   1   -360
360;
    839 809 0.00026 0.00313 0   1282    0   0   0   0   1   -360
360;
    4506    2286    0.0047  0.0318  0   376 0   0   0   0   1   -360
360;
    4506    6802    0.00136 0.00768 0   338 0   0   0   0   1   -360
360;
    4506    3520    0.005669    0.027789    0   300 0   0   0   0   1
-360    360;
    7273    6271    0.004409    0.033091    0   281 0   0   0   0   1
-360    360;
    7273    1435    0.01056 0.044469    0   0   0   0   0   0   1   -
360    360;
    7273    7148    0.01963 0.07736 0   338 0   0   0   0   1   -360
360;
    7273    7437    0.01157 0.04694 0   357 0   0   0   0   1   -360
360;
    6104    871 0.000479    0.00255 0   357 0   0   0   0   1   -360
360;
    7580    871 0.000469    0.00236 0   0   0   0   0   0   1   -360
360;
    1188    1539    0.01237 0.067039    0   281 0   0   0   0   1   -
360    360;
```

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    1188    8515    0.0132  0.056229    0   281 0   0   0   0   1   -
360    360;
    3971    4084    0.00026 0.001711    0   0   0   0   0   0   1   -
360    360;
    3971    4084    0.000271    0.001669    0   0   0   0   0   0   1
-360    360;
    6845    5340    0.000211    0.000401    0   0   0   0   0   0   1
-360    360;
    8294    5814    0.00105 0.005159    0   0   0   0   0   0   1   -
360    360;
    7115    6807    0.00212 0.00931 0   319 0   0   0   0   1   -360
360;
    619 6791    0.000151    0.00068 0   0   0   0   0   0   1   -360
360;
    5418    4908    0.00019 0.00082 0   0   0   0   0   0   1   -360
360;
    5120    6816    0.003219    0.01405 0   300 0   0   0   0   1   -
360    360;
    6692    9158    0.007271    0.033159    0   281 0   0   0   0   1
-360    360;
    6692    8035    0.006659    0.03132 0   300 0   0   0   0   1   -
360    360;
    3445    2848    0.00057 0.00668 0   1480    0   0   0   0   1   -
360    360;
    3445    7056    0.00057 0.00758 0   1414    0   0   0   0   1   -
360    360;
    3445    7056    0.00039 0.00607 0   821 0   0   0   0   1   -360
360;
    3445    1642    0.00155 0.0179  0   0   0   0   0   0   1   -360
360;
    3445    4594    0.00036 0.00485 0   1545    0   0   0   0   1   -
360    360;
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-360    360;
    6114    8190    0.00056 0.00431 0   0   0   0   0   0   1   -360
360;
    6114    5836    0.003099    0.020531    0   472 0   0   0   0   1
-360    360;
    6114    3191    0.00118 0.016919    0   510 0   0   0   0   1   -
360    360;
    6114    5300    0.00188 0.01407 0   0   0   0   0   0   1   -360
360;
    6114    4889    0.00545 0.04082 0   357 0   0   0   0   1   -360
360;
    7264    444 0.00214 0.01639 0   453 0   0   0   0   1   -360
360;
    7264    4747    0.002479    0.01549 0   0   0   0   0   0   1   -
360    360;
    7982    9011    0.000159    0.001229    0   472 0   0   0   0   1
-360    360;
    7982    6675    0.00026 0.00162 0   453 0   0   0   0   1   -360
360;
    7982    6909    0.000159    0.00113 0   376 0   0   0   0   1   -
360    360;
    7982    8835    0.000461    0.003219    0   472 0   0   0   0   1
-360    360;
```

```
    7982    4186    0.000159    0.001229    0   0   0   0   0   0   1
-360    360;
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360;
    2842    502 0.0002  0.00156 0   338 0   0   0   0   1   -360
360;
    1354    513 0.00145 0.00824 0   281 0   0   0   0   1   -360
360;
    1354    502 0.00069 0.005   0   491 0   0   0   0   1   -360
360;
    891 3697    0.00036 0.00455 0   1809    0   0   0   0   1   -360
360;
    891 3697    0.00036 0.00453 0   1776    0   0   0   0   1   -360
360;
    8312    7541    0.00066 0.00997 0   1348    0   0   0   0   1   -
360    360;
    8312    7541    0.00064 0.01016 0   986 0   0   0   0   1   -360
360;
    6306    4826    9.9e-05 0.00044 0   529 0   0   0   0   1   -360
360;
    4826    4418    6e-05   0.000469    0   0   0   0   0   0   1   -
360    360;
    4826    1605    3.9e-05 0.000341    0   0   0   0   0   0   1   -
360    360;
    4826    6952    0.002531    0.01943 0   433 0   0   0   0   1   -
360    360;
    4826    7124    0.00945 0.06418 0   414 0   0   0   0   1   -360
360;
    9128    217 0.000591    0.002831    0   357 0   0   0   0   1   -
360    360;
    7014    217 0.00087 0.00387 0   0   0   0   0   0   1   -360
360;
    720 5350    0.0015  0.01785 0   1183    0   0   0   0   1   -360
360;
    720 5350    0.00147 0.0182  0   1151    0   0   0   0   1   -360
360;
    1711    639 0.00151 0.0113  0   376 0   0   0   0   1   -360
360;
    1711    639 0.001479    0.011521    0   395 0   0   0   0   1   -
360    360;
    1711    9130    0.00174 0.010341    0   414 0   0   0   0   1   -
360    360;
    1711    9130    0.001659    0.01206 0   453 0   0   0   0   1   -
360    360;
    8209    1998    0.00069 0.000479    0   0   0   0   0   0   1   -
360    360;
    8209    7974    0.00044 0.00139 0   0   0   0   0   0   1   -360
360;
    1035    8180    0.002039    0.01601 0   0   0   0   0   0   1   -
360    360;
    1035    7466    0.01349 0.05662 0   357 0   0   0   0   1   -360
360;
    1035    305 0.00082 0.00438 0   300 0   0   0   0   1   -360
360;
    1035    305 0.0008  0.004461    0   281 0   0   0   0   1   -360
360;
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    1035    5106    0.001091    0.00888 0   453 0   0   0   0   1   -
360    360;
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360    360;
    2527    8466    0.000849    0.00537 0   433 0   0   0   0   1   -
360    360;
    8669    8893    0.00061 0.00275 0   357 0   0   0   0   1   -360
360;
    6206    7691    0.00141 0.0188  0   1315    0   0   0   0   1   -
360    360;
    6206    6624    0.00121 0.01427 0   1545    0   0   0   0   1   -
360    360;
    3240    8158    0.001711    0.007159    0   338 0   0   0   0   1
-360    360;
    3240    8795    0.00545 0.02381 0   300 0   0   0   0   1   -360
360;
    3240    4143    0.000771    0.004331    0   0   0   0   0   0   1
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360;
    3240    6331    0.00264 0.011521    0   338 0   0   0   0   1   -
360    360;
    3240    6384    0.00261 0.011   0   376 0   0   0   0   1   -360
360;
    3240    7523    0.00239 0.00919 0   319 0   0   0   0   1   -360
360;
    3240    2889    0.000539    0.00226 0   0   0   0   0   0   1   -
360    360;
    3240    6887    0.00325 0.017979    0   472 0   0   0   0   1   -
360    360;
    1249    4541    0.00076 0.0071  0   1216    0   0   0   0   1   -
360    360;
    819 7523    0.000651    0.00343 0   0   0   0   0   0   1   -360
360;
    2304    4353    0.001219    0.00812 0   338 0   0   0   0   1   -
360    360;
    2304    4816    0.00243 0.01439 0   491 0   0   0   0   1   -360
360;
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360    360;
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360    360;
    9174    5658    0.00087 0.01328 0   1677    0   0   0   0   1   -
360    360;
    9174    5658    0.00073 0.01595 0   1249    0   0   0   0   1   -
360    360;
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360    360;
    2924    3645    0.001659    0.002   0   0   0   0   0   0   1   -
360    360;
    59  5764    0.00339 0.019669    0   472 0   0   0   0   1   -360
360;
    59  2360    0.00239 0.017281    0   529 0   0   0   0   1   -360
360;
    6510    9033    0.00032 0.00112 0   395 0   0   0   0   1   -360
360;
```

```
    6510    5918    0.0018  0.01401 0   395 0   0   0   0   1   -360
360;
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360    360;
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360;
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360    360;
    6426    3558    0.01007 0.03056 0   0   0   0   0   0   1   -360
360;
    1758    2816    0.00042 0.00623 0   0   0   0   0   0   1   -360
360;
    1758    352 0.00036 0.00722 0   1743    0   0   0   0   1   -360
360;
    1758    6581    0.00053 0.0078  0   854 0   0   0   0   1   -360
360;
    1758    1923    0.00109 0.0173  0   723 0   0   0   0   1   -360
360;
    1758    5837    0.00071 0.01144 0   0   0   0   0   0   1   -360
360;
    1758    3830    0.00157 0.01884 0   1151    0   0   0   0   1   -
360    360;
    1758    3577    0.00032 0.00384 0   756 0   0   0   0   1   -360
360;
    8030    1794    0.00041 0.00649 0   1447    0   0   0   0   1   -
360    360;
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360;
    8030    6581    0.00054 0.00763 0   854 0   0   0   0   1   -360
360;
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360;
    8030    5837    0.0007  0.01165 0   0   0   0   0   0   1   -360
360;
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360    360;
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360;
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360;
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360;
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360;
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360    360;
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360;
    8361    2928    0.00037 0.000969    0   357 0   0   0   0   1   -
360    360;
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360;
    609 5419    0.00076 0.00399 0   395 0   0   0   0   1   -360
360;
```

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360;
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360    360;
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360;
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360;
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360    360;
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360    360;
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360    360;
    1355    1081    0.00263 0.02648 0   1480    0   0   0   0   1   -
360    360;
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360    360;
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360;
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360;
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-360    360;
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-360    360;
    5856    3925    0.0053  0.03257 0   338 0   0   0   0   1   -360
360;
    5856    3324    0.00513 0.041901    0   453 0   0   0   0   1   -
360    360;
    5856    4748    0.001461    0.01056 0   357 0   0   0   0   1   -
360    360;
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360    360;
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360;
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360    360;
    4005    2177    0.0075  0.043531    0   357 0   0   0   0   1   -
360    360;
    5723    2079    0.00138 0.019961    0   0   0   0   0   0   1   -
360    360;
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360;
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360    360;
    2327    3400    0.00019 0.001461    0   0   0   0   0   0   1   -
360    360;
    207 4747    0.002151    0.013401    0   376 0   0   0   0   1   -
360    360;
    207 7791    0.000789    0.005669    0   472 0   0   0   0   1   -
360    360;
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360;
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360;
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360;
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360    360;
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360;
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360;
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360    360;
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360;
    4683    416 0.00294 0.02443 0   529 0   0   0   0   1   -360
360;
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360    360;
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-360    360;
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360    360;
    4683    2995    0.00144 0.019591    0   281 0   0   0   0   1   -
360    360;
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360;
    5691    4426    0.009591    0.073961    0   414 0   0   0   0   1
-360    360;
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360    360;
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360    360;
    2361    4936    0.001901    0.00964 0   529 0   0   0   0   1   -
360    360;
    2361    5179    0.001711    0.01189 0   510 0   0   0   0   1   -
360    360;
    2044    4748    0.00025 0.00187 0   0   0   0   0   0   1   -360
360;
    4197    5522    0.00043 0.002211    0   0   0   0   0   0   1   -
360    360;
    5699    8670    0.000401    0.00243 0   0   0   0   0   0   1   -
360    360;
    7809    5110    0.00336 0.017   0   357 0   0   0   0   1   -360
360;
    7222    4816    0.005521    0.031031    0   0   0   0   0   0   1
-360    360;
    4402    3817    9.9e-05 0.00026 0   0   0   0   0   0   1   -360
360;
    6857    2732    0.00045 0.00718 0   986 0   0   0   0   1   -360
360;
    6857    4550    0.00044 0.00665 0   821 0   0   0   0   1   -360
360;
    6857    4339    0.00103 0.01516 0   1183    0   0   0   0   1   -
360    360;
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    6857    7513    0.00101 0.01546 0   854 0   0   0   0   1   -360
360;
    5016    26  0.00045 0.00608 0   1414    0   0   0   0   1   -360
360;
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360    360;
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360    360;
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360;
    6112    883 0.002341    0.018961    0   414 0   0   0   0   1   -
360    360;
    6112    5738    0.001841    0.01363 0   376 0   0   0   0   1   -
360    360;
    8860    7700    0.001219    0.00949 0   395 0   0   0   0   1   -
360    360;
    8860    9002    0.002271    0.01151 0   395 0   0   0   0   1   -
360    360;
    8860    5990    0.010781    0.05775 0   0   0   0   0   0   1   -
360    360;
    8860    6450    0.00251 0.013919    0   300 0   0   0   0   1   -
360    360;
    8860    7726    0.00101 0.007331    0   414 0   0   0   0   1   -
360    360;
    2489    4110    0.00061 0.003909    0   529 0   0   0   0   1   -
360    360;
    3985    6376    0.004289    0.019331    0   0   0   0   0   0   1
-360    360;
    3985    4110    0.0008  0.004401    0   529 0   0   0   0   1   -
360    360;
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360    360;
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360    360;
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360    360;
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360;
    2489    2231    0.001211    0.00538 0   0   0   0   0   0   1   -
360    360;
    658 3793    0.00418 0.030159    0   472 0   0   0   0   1   -360
360;
    658 8497    0.00324 0.02413 0   510 0   0   0   0   1   -360
360;
    658 8497    0.003169    0.024591    0   529 0   0   0   0   1   -
360    360;
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360    360;
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360    360;
    6313    44  0.0035  0.022211    0   453 0   0   0   0   1   -360
360;
    6313    7582    0.00313 0.02256 0   0   0   0   0   0   1   -360
360;
    5944    8808    0.000831    0.00162 0   0   0   0   0   0   1   -
360    360;
```

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    3183    8515    0.002099    0.01068 0   300 0   0   0   0   1   -
360    360;
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360;
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360;
    6636    9051    0.00011 0.00076 0   0   0   0   0   0   1   -360
360;
    9109    9051    0.00011 0.00068 0   0   0   0   0   0   1   -360
360;
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-360    360;
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-360    360;
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-360    360;
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360;
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360    360;
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360;
    549 2291    0.004659    0.021919    0   319 0   0   0   0   1   -
360    360;
    549 3656    0.001659    0.01043 0   472 0   0   0   0   1   -360
360;
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360;
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360;
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360;
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360;
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360    360;
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360    360;
    5490    6897    0.00066 0.01096 0   1809    0   0   0   0   1   -
360    360;
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360    360;
    564 8475    0.003901    0.02437 0   0   0   0   0   0   1   -360
360;
    564 2252    0.00276 0.016461    0   453 0   0   0   0   1   -360
360;
    564 7903    0.00588 0.047081    0   0   0   0   0   0   1   -360
360;
    4331    1857    3.9e-05 0.000219    0   0   0   0   0   0   1   -
360    360;
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360;
```

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360;
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360;
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360    360;
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360;
    9112    8515    0.00363 0.01743 0   338 0   0   0   0   1   -360
360;
    9112    8515    0.00257 0.01662 0   433 0   0   0   0   1   -360
360;
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360    360;
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360;
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360    360;
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360    360;
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360    360;
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360    360;
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360;
    4701    8267    0.00011 0.001   0   657 0   0   0   0   1   -360
360;
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360    360;
    3880    5365    0.000219    0.001031    0   0   0   0   0   0   1
-360    360;
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360    360;
    3609    5365    0.000271    0.000979    0   0   0   0   0   0   1
-360    360;
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360    360;
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360    360;
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-360    360;
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360;
    4049    883 0.000169    0.000271    0   0   0   0   0   0   1   -
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    4520    883 0.000169    0.00031 0   0   0   0   0   0   1   -360
360;
    1704    5814    0.00526 0.03787 0   453 0   0   0   0   1   -360
360;
    8107    1486    0.000229    0.000599    0   0   0   0   0   0   1
-360    360;
```

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360    360;
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360;
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360    360;
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    455 7775    0.00369 0.02712 0   453 0   0   0   0   1   -360
360;
    455 3857    0.0062  0.04864 0   529 0   0   0   0   1   -360
360;
    455 333 0.008021    0.059031    0   529 0   0   0   0   1   -360
360;
    455 6940    0.004979    0.0295  0   472 0   0   0   0   1   -360
360;
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360;
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360    360;
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360    360;
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360;
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360    360;
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360;
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360    360;
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360    360;
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360;
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360;
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360;
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360    360;
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360;
    416 7937    0.00418 0.02388 0   414 0   0   0   0   1   -360
360;
```

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360;
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360    360;
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360;
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360    360;
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360;
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360;
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360;
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    4494    7056    0.00107 0.01326 0   1480    0   0   0   0   1   -
360    360;
```

```
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360    360;
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360;
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360;
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360    360;
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360    360;
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360    360;
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360;
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360;
```

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360    360;
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360;
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360    360;
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360;
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360    360;
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360;
    367 8722    0.0005  0.00619 0   529 0   0   0   0   1   -360
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360    360;
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360    360;
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360    360;
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360    360;
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360    360;
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360;
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360;
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360;
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360;
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360;
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360;
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360    360;
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360    360;
    7691    3513    0.00041 0.00397 0   1216    0   0   0   0   1   -
360    360;
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360    360;
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360;
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360    360;
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360;
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360;
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360    360;
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-360    360;
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360    360;
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360;
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360;
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360    360;
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360;
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360    360;
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360;
    750 2961    0.00018 0.000669    0   433 0   0   0   0   1   -360
360;
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360;
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360    360;
    3499    7640    0.00123 0.01185 0   1348    0   0   0   0   1   -
360    360;
    3499    4231    0.00058 0.0097  0   1085    0   0   0   0   1   -
360    360;
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360    360;
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360;
    7289    3999    0.0013  0.006841    0   357 0   0   0   0   1   -
360    360;
    3018    1051    6e-05   0.000349    0   338 0   0   0   0   1   -
360    360;
    2702    3435    0.000169    0.0007  0   300 0   0   0   0   1   -
360    360;
    9131    2020    0.000169    0.000719    0   0   0   0   0   0   1
-360    360;
    6308    6684    0.000271    0.001031    0   0   0   0   0   0   1
-360    360;
    4831    3680    0.008271    0.036841    0   0   0   0   0   0   1
-360    360;
    5410    2751    0.002969    0.02299 0   319 0   0   0   0   1   -
360    360;
    3082    4623    0.00124 0.01273 0   1118    0   0   0   0   1   -
360    360;
    3082    4339    0.00106 0.00989 0   1381    0   0   0   0   1   -
360    360;
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360;
    3082    5421    9e-05   0.00079 0   657 0   0   0   0   1   -360
360;
    3082    6475    0.00196 0.02049 0   1513    0   0   0   0   1   -
360    360;
    3082    8468    0.00158 0.01519 0   1183    0   0   0   0   1   -
360    360;
    6224    2732    0.00172 0.01811 0   1513    0   0   0   0   1   -
360    360;
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360    360;
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360;
    2174    4623    0.00129 0.0129  0   1216    0   0   0   0   1   -
360    360;
    2174    4550    0.00179 0.01737 0   1545    0   0   0   0   1   -
360    360;
    2174    6475    0.00131 0.01935 0   1677    0   0   0   0   1   -
360    360;
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360    360;
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360;
    2083    4054    0.00012 0.000849    0   0   0   0   0   0   1   -
360    360;
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360;
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360;
    2083    2794    0.00032 0.00257 0   0   0   0   0   0   1   -360
360;
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360;
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360;
    8853    6697    0.003919    0.01612 0   338 0   0   0   0   1   -
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360;
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360;
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360    360;
    2938    1642    0.00221 0.02217 0   1710    0   0   0   0   1   -
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    2938    809 0.00224 0.0217  0   1710    0   0   0   0   1   -360
360;
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360    360;
    9189    7092    0.00068 0.00306 0   0   0   0   0   0   1   -360
360;
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360;
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-360    360;
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360;
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    8691    1183    0.0027  0.02089 0   0   0   0   0   0   1   -360
360;
    8691    4410    0.003419    0.02636 0   510 0   0   0   0   1   -
360    360;
    8691    8743    0.009531    0.033711    0   357 0   0   0   0   1
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360;
    2627    8763    0.00035 0.00701 0   0   0   0   0   0   1   -360
360;
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360;
    4951    6785    0.00156 0.01936 0   414 0   0   0   0   1   -360
360;
    4623    964 0.00078 0.00941 0   1249    0   0   0   0   1   -360
360;
    4623    964 0.00074 0.00969 0   1480    0   0   0   0   1   -360
360;
    4623    8347    0.00042 0.00532 0   1578    0   0   0   0   1   -
360    360;
    4623    8347    0.0004  0.00473 0   1743    0   0   0   0   1   -
360    360;
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360    360;
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360;
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360;
    506 960 2e-05   0.00031 0   657 0   0   0   0   1   -360    360;
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360;
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360    360;
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360;
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360;
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360    360;
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360    360;
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360;
    778 6820    0.001031    0.00361 0   0   0   0   0   0   1   -360
360;
    778 3071    0.00813 0.030961    0   0   0   0   0   0   1   -360
360;
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-360    360;
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360    360;
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360;
    346 6570    0.00113 0.004979    0   376 0   0   0   0   1   -360
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360;
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360;
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360;
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360    360;
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360;
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360    360;
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360    360;
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360;
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360    360;
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360    360;
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360;
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360    360;
    4711    5836    0.000781    0.00488 0   529 0   0   0   0   1   -
360    360;
    4711    575 0.000781    0.00511 0   433 0   0   0   0   1   -360
360;
    4711    8214    0.00064 0.003539    0   357 0   0   0   0   1   -
360    360;
    4711    8214    0.00057 0.003781    0   338 0   0   0   0   1   -
360    360;
    4711    3021    0.000531    0.00111 0   0   0   0   0   0   1   -
360    360;
    4711    7967    0.000521    0.00113 0   0   0   0   0   0   1   -
360    360;
    4711    5993    0.00176 0.00843 0   338 0   0   0   0   1   -360
360;
    4711    8804    0.002461    0.01975 0   472 0   0   0   0   1   -
360    360;
    4513    6831    0.000591    0.00105 0   0   0   0   0   0   1   -
360    360;
```

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    2043    1422    0.00012 0.00064 0   0   0   0   0   0   1   -360
360;
    6714    1808    0.000581    0.004419    0   0   0   0   0   0   1
-360    360;
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-360    360;
    513 2866    0.001289    0.008289    0   395 0   0   0   0   1   -
360    360;
    4970    9222    0.00233 0.03502 0   657 0   0   0   0   1   -360
360;
    4970    9222    0.00238 0.03781 0   657 0   0   0   0   1   -360
360;
    4970    2072    0.00052 0.00605 0   1282    0   0   0   0   1   -
360    360;
    4970    5461    0.00023 0.00275 0   1414    0   0   0   0   1   -
360    360;
    4970    8109    0.00134 0.01343 0   1611    0   0   0   0   1   -
360    360;
    4970    8109    0.00116 0.01552 0   1381    0   0   0   0   1   -
360    360;
    7955    707 0.004169    0.027919    0   414 0   0   0   0   1   -
360    360;
    7955    4816    0.00063 0.008   0   0   0   0   0   0   1   -360
360;
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-360    360;
    7955    5488    0.007419    0.05787 0   491 0   0   0   0   1   -
360    360;
    5093    2467    0.002719    0.020331    0   395 0   0   0   0   1
-360    360;
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360    360;
    9180    195 0.00238 0.013219    0   357 0   0   0   0   1   -360
360;
    9180    3133    0.003771    0.02701 0   395 0   0   0   0   1   -
360    360;
    292 4544    0.001271    0.00939 0   0   0   0   0   0   1   -360
360;
    9002    6737    0.000841    0.00131 0   0   0   0   0   0   1   -
360    360;
    8439    3758    0.005711    0.043039    0   491 0   0   0   0   1
-360    360;
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360    360;
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360    360;
    4974    163 0.004841    0.03149 0   433 0   0   0   0   1   -360
360;
    747 8507    0.00057 0.00107 0   0   0   0   0   0   1   -360
360;
    6909    4914    0.000539    0.00213 0   414 0   0   0   0   1   -
360    360;
    444 4747    0.0007  0.00425 0   0   0   0   0   0   1   -360
360;
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360    360;
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    1459    2751    0.00206 0.015901    0   0   0   0   0   0   1   -
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360;
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360    360;
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360;
    5709    6475    3e-05   0.00039 0   1183    0   0   0   0   1   -
360    360;
    3825    6475    3e-05   0.00038 0   0   0   0   0   0   1   -360
360;
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360    360;
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360    360;
    3072    639 0.000591    0.004341    0   376 0   0   0   0   1   -
360    360;
    3072    639 0.000591    0.00405 0   395 0   0   0   0   1   -360
360;
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360    360;
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360;
    757 964 0.00058 0.00807 0   986 0   0   0   0   1   -360    360;
    757 964 0.00056 0.00823 0   821 0   0   0   0   1   -360    360;
    757 3906    0.00123 0.01146 0   1315    0   0   0   0   1   -360
360;
    757 3906    0.0011  0.01298 0   1381    0   0   0   0   1   -360
360;
    757 8347    0.00156 0.01585 0   1677    0   0   0   0   1   -360
360;
    757 2919    0.00226 0.02781 0   1381    0   0   0   0   1   -360
360;
    3758    188 0.00614 0.02831 0   300 0   0   0   0   1   -360
360;
    3758    2242    0.00513 0.03401 0   0   0   0   0   0   1   -360
360;
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360    360;
    5743    6990    0.012969    0.06087 0   0   0   0   0   0   1   -
360    360;
    8626    8930    0.00437 0.032831    0   453 0   0   0   0   1   -
360    360;
    8626    2467    0.005651    0.033229    0   491 0   0   0   0   1
-360    360;
    2161    5488    0.008969    0.03625 0   338 0   0   0   0   1   -
360    360;
    2161    7772    0.012409    0.05645 0   319 0   0   0   0   1   -
360    360;
    5003    6382    0.00038 0.002271    0   300 0   0   0   0   1   -
360    360;
    6474    4084    0.00138 0.01089 0   472 0   0   0   0   1   -360
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    6474    4084    0.001539    0.012521    0   491 0   0   0   0   1
-360    360;
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360;
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360;
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360    360;
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360    360;
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360;
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360    360;
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360    360;
    3697    8486    0.00082 0.01038 0   1447    0   0   0   0   1   -
360    360;
    3697    7530    0.00093 0.01017 0   1282    0   0   0   0   1   -
360    360;
    3697    1502    0.00137 0.01431 0   1776    0   0   0   0   1   -
360    360;
    3697    1552    0.00215 0.02021 0   1578    0   0   0   0   1   -
360    360;
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360    360;
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360    360;
    6738    2526    0.00092 0.014   0   1151    0   0   0   0   1   -
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360;
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360    360;
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360    360;
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360    360;
    8180    5106    0.001081    0.008099    0   472 0   0   0   0   1
-360    360;
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360;
    9222    8872    1e-05   0.00029 0   1677    0   0   0   0   1   -
360    360;
    9222    8672    0.00071 0.00892 0   1480    0   0   0   0   1   -
360    360;
    9222    7164    0.00136 0.01526 0   1348    0   0   0   0   1   -
360    360;
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-360    360;
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360    360;
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-360    360;
    283 800 0.00038 0.00139 0   0   0   0   0   0   1   -360    360;
    283 1077    0.00037 0.0015  0   0   0   0   0   0   1   -360
360;
    283 4747    0.00069 0.004461    0   433 0   0   0   0   1   -360
360;
    3391    5213    0.00688 0.040591    0   281 0   0   0   0   1   -
360    360;
    3391    115 0.001341    0.008349    0   376 0   0   0   0   1   -
360    360;
    3391    115 0.001229    0.009669    0   529 0   0   0   0   1   -
360    360;
    4867    5753    0.00137 0.006039    0   319 0   0   0   0   1   -
360    360;
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360    360;
    7539    871 0.00163 0.0095  0   433 0   0   0   0   1   -360
360;
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360;
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360    360;
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360;
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360    360;
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360;
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360;
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360;
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360;
    804 7519    0.00175 0.01976 0   433 0   0   0   0   1   -360
360;
    804 6744    0.001729    0.019331    0   376 0   0   0   0   1   -
360    360;
    2286    6802    0.00406 0.02581 0   472 0   0   0   0   1   -360
360;
    2286    769 0.00526 0.025961    0   414 0   0   0   0   1   -360
360;
    3239    1081    0.00179 0.02098 0   1249    0   0   0   0   1   -
360    360;
```

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360;
    3239    960 0.00109 0.01361 0   986 0   0   0   0   1   -360
360;
    3239    960 0.00097 0.0153  0   789 0   0   0   0   1   -360
360;
    3239    3906    0.00322 0.03022 0   1381    0   0   0   0   1   -
360    360;
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360    360;
    1539    2676    0.01994 0.066719    0   0   0   0   0   0   1   -
360    360;
    1539    3793    0.018591    0.07462 0   338 0   0   0   0   1   -
360    360;
    1539    4529    0.008979    0.03251 0   0   0   0   0   0   1   -
360    360;
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360;
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360;
    8628    6630    0.001271    0.007831    0   338 0   0   0   0   1
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360    360;
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360;
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360    360;
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360;
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360    360;
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360    360;
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-360    360;
```

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360    360;
    184 1526    0.00044 0.00069 0   0   0   0   0   0   1   -360
360;
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360;
    8676    933 0.00175 0.0067  0   319 0   0   0   0   1   -360
360;
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360;
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360    360;
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360;
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360;
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360    360;
    5574    5666    0.00301 0.01538 0   414 0   0   0   0   1   -360
360;
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360;
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360;
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360;
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360    360;
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360;
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360;
    4084    5340    0.00213 0.01401 0   529 0   0   0   0   1   -360
360;
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360;
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360;
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360;
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360;
    6337    8931    0.00026 0.00426 0   657 0   0   0   0   1   -360
360;
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360;
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360    360;
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360;
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-360    360;
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360    360;
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360    360;
    2432    6940    0.00938 0.05355 0   472 0   0   0   0   1   -360
360;
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360;
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360    360;
    5213    7437    0.00731 0.04106 0   338 0   0   0   0   1   -360
360;
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360    360;
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360    360;
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360    360;
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-360    360;
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360    360;
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-360    360;
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360    360;
    4656    4235    0.003219    0.01969 0   376 0   0   0   0   1   -
360    360;
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360;
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-360    360;
    8250    5720    0.00264 0.019729    0   433 0   0   0   0   1   -
360    360;
    8250    5720    0.002581    0.02011 0   395 0   0   0   0   1   -
360    360;
    6831    6723    0.00037 0.002831    0   453 0   0   0   0   1   -
360    360;
    6831    5686    0.00213 0.012789    0   414 0   0   0   0   1   -
360    360;
    2377    805 0.018669    0.092281    0   338 0   0   0   0   1   -
360    360;
    907 9091    3.9e-05 0.000401    0   0   0   0   0   0   1   -360
360;
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360;
    6837    2142    6e-05   0.0005  0   414 0   0   0   0   1   -360
360;
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360    360;
    5666    7577    0.00055 0.00338 0   491 0   0   0   0   1   -360
360;
    5666    7577    0.00105 0.004771    0   395 0   0   0   0   1   -
360    360;
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    726 687 0.00036 0.004349    0   510 0   0   0   0   1   -360
360;
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360;
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360;
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360;
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360    360;
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360    360;
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360;
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360    360;
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360    360;
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360;
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360;
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360;
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360    360;
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360;
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360;
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360    360;
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360    360;
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360    360;
    2797    8367    0.00307 0.019159    0   491 0   0   0   0   1   -
360    360;
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360;
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360    360;
    7738    6982    0.020419    0.063669    0   0   0   0   0   0   1
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360;
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360;
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360;
    1625    766 0.00037 0.00151 0   0   0   0   0   0   1   -360
360;
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360;
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360;
    964 6475    0.00063 0.00821 0   887 0   0   0   0   1   -360
360;
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360;
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360    360;
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360;
    5658    7328    0.00137 0.02182 0   0   0   0   0   0   1   -360
360;
    5658    7164    0.00212 0.02063 0   1118    0   0   0   0   1   -
360    360;
    5550    410 0.00186 0.01045 0   510 0   0   0   0   1   -360
360;
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360    360;
    5550    7579    0.002659    0.020539    0   395 0   0   0   0   1
-360    360;
    5550    4189    0.00606 0.049919    0   357 0   0   0   0   1   -
360    360;
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360;
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360;
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360    360;
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360    360;
    4541    3346    0.00529 0.03969 0   920 0   0   0   0   1   -360
360;
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360    360;
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360    360;
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360;
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360;
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360;
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360;
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360;
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360    360;
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360    360;
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360;
    90  1860    0.00368 0.02074 0   491 0   0   0   0   1   -360
360;
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360    360;
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360;
    2142    6842    0.003081    0.017961    0   319 0   0   0   0   1
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360;
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360;
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360;
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360    360;
    803 6982    0.01087 0.06114 0   338 0   0   0   0   1   -360
360;
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360;
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360    360;
    500 772 0.002591    0.017211    0   453 0   0   0   0   1   -360
360;
    500 8950    0.00164 0.013651    0   395 0   0   0   0   1   -360
360;
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-360    360;
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360    360;
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360    360;
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360;
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360;
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360    360;
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360;
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360;
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360;
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360;
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360;
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360;
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360    360;
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360;
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360    360;
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    3809    6691    0.00169 0.008831    0   0   0   0   0   0   1   -
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360    360;
    601 616 0.003099    0.01844 0   395 0   0   0   0   1   -360
360;
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360    360;
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360    360;
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360    360;
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360    360;
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360;
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360;
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360;
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360;
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360;
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360;
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360;
    666 4550    0.00335 0.03648 0   1381    0   0   0   0   1   -360
360;
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360;
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360    360;
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360;
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360;
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360    360;
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360;
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360    360;
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    7694    3865    0.000219    0.00064 0   0   0   0   0   0   1   -
360    360;
    9181    6723    0.00014 0.00105 0   0   0   0   0   0   1   -360
360;
    8373    8748    0.003219    0.020729    0   433 0   0   0   0   1
-360    360;
```

```
    8373    8475    0.00051 0.003151    0   472 0   0   0   0   1   -
360    360;
    8373    8475    0.000409    0.00331 0   414 0   0   0   0   1   -
360    360;
    5630    6639    0.002289    0.017479    0   491 0   0   0   0   1
-360    360;
    5630    1187    0.002831    0.01895 0   433 0   0   0   0   1   -
360    360;
    5630    7274    0.006289    0.036521    0   0   0   0   0   0   1
-360    360;
    5630    8992    0.005651    0.032169    0   338 0   0   0   0   1
-360    360;
    5630    7266    0.00414 0.02262 0   376 0   0   0   0   1   -360
360;
    3492    6734    0.01095 0.05814 0   357 0   0   0   0   1   -360
360;
    3492    1015    0.009   0.0368  0   395 0   0   0   0   1   -360
360;
    3492    8310    0.000229    0.00181 0   453 0   0   0   0   1   -
360    360;
    1980    6570    0.00119 0.00726 0   510 0   0   0   0   1   -360
360;
    9137    749 0.011771    0.051669    0   529 0   0   0   0   1   -
360    360;
    7522    2183    0.00209 0.02279 0   1611    0   0   0   0   1   -
360    360;
    7571    3916    0.002031    0.01443 0   0   0   0   0   0   1   -
360    360;
    7571    6891    0.00145 0.008479    0   453 0   0   0   0   1   -
360    360;
    2526    6199    0.00124 0.01433 0   1414    0   0   0   0   1   -
360    360;
    2526    6199    0.00127 0.01402 0   1776    0   0   0   0   1   -
360    360;
    1483    3649    0.013039    0.052841    0   529 0   0   0   0   1
-360    360;
    2365    6199    0.00235 0.02739 0   854 0   0   0   0   1   -360
360;
    2365    6199    0.0024  0.02681 0   1118    0   0   0   0   1   -
360    360;
    2365    4141    0.00135 0.02056 0   657 0   0   0   0   1   -360
360;
    2365    1311    0.00087 0.01124 0   854 0   0   0   0   1   -360
360;
    8316    174 0.0012  0.00818 0   529 0   0   0   0   1   -360
360;
    174 6430    0.006961    0.05561 0   395 0   0   0   0   1   -360
360;
    5340    7892    0.00105 0.00763 0   376 0   0   0   0   1   -360
360;
    5340    561 0.000219    0.00182 0   0   0   0   0   0   1   -360
360;
    5340    8843    3.9e-05 0.0002  0   0   0   0   0   0   1   -360
360;
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360    360;
```

```
    5340    4239    0.0035  0.022651    0   433 0   0   0   0   1   -
360    360;
    3866    1860    0.004281    0.02319 0   357 0   0   0   0   1   -
360    360;
    3866    5395    0.003729    0.014021    0   319 0   0   0   0   1
-360    360;
    7042    2177    0.00212 0.01582 0   472 0   0   0   0   1   -360
360;
    8672    7164    0.00056 0.00784 0   657 0   0   0   0   1   -360
360;
    1860    7772    0.004401    0.01813 0   0   0   0   0   0   1   -
360    360;
    1860    7772    0.005021    0.02144 0   0   0   0   0   0   1   -
360    360;
    4885    2928    0.00018 0.000219    0   281 0   0   0   0   1   -
360    360;
    4157    2928    0.000151    0.000211    0   0   0   0   0   0   1
-360    360;
    4432    2928    0.000151    0.000211    0   0   0   0   0   0   1
-360    360;
    2072    5983    0.00282 0.02591 0   1381    0   0   0   0   1   -
360    360;
    3450    6552    0.00131 0.008539    0   433 0   0   0   0   1   -
360    360;
    3956    7507    0.002159    0.015969    0   0   0   0   0   0   1
-360    360;
    5286    1838    0.00019 0.000281    0   0   0   0   0   0   1   -
360    360;
    5571    2230    0.0002  0.000281    0   0   0   0   0   0   1   -
360    360;
    2078    8005    0.00139 0.00774 0   472 0   0   0   0   1   -360
360;
    639 6351    0.01101 0.06739 0   529 0   0   0   0   1   -360
360;
    639 2749    0.00063 0.00463 0   338 0   0   0   0   1   -360
360;
    639 9130    0.002341    0.009599    0   376 0   0   0   0   1   -
360    360;
    410 4189    0.00375 0.021659    0   376 0   0   0   0   1   -360
360;
    1494    5781    0.00056 0.00749 0   1183    0   0   0   0   1   -
360    360;
    583 6616    0.00118 0.00926 0   433 0   0   0   0   1   -360
360;
    583 6031    0.002039    0.013081    0   414 0   0   0   0   1   -
360    360;
    1746    7507    0.00155 0.010961    0   0   0   0   0   0   1   -
360    360;
    3276    7635    3.9e-05 0.00036 0   319 0   0   0   0   1   -360
360;
    1105    196 0.00024 0.000409    0   281 0   0   0   0   1   -360
360;
    8522    7132    0.000341    0.001659    0   453 0   0   0   0   1
-360    360;
    8522    5351    0.005461    0.024919    0   357 0   0   0   0   1
-360    360;
```

```
    8763    7056    0.00158 0.02413 0   854 0   0   0   0   1   -360
360;
    8763    8825    0.00155 0.02458 0   756 0   0   0   0   1   -360
360;
    8763    6889    0.00021 0.00256 0   1315    0   0   0   0   1   -
360    360;
    8763    6889    0.00024 0.00243 0   1414    0   0   0   0   1   -
360    360;
    8763    8887    0.00144 0.02266 0   1414    0   0   0   0   1   -
360    360;
    8763    8887    0.0014  0.02098 0   1447    0   0   0   0   1   -
360    360;
    8763    8487    0.00086 0.01074 0   0   0   0   0   0   1   -360
360;
    8748    8475    0.003341    0.02611 0   453 0   0   0   0   1   -
360    360;
    217 6785    0.00387 0.02063 0   414 0   0   0   0   1   -360
360;
    217 6785    0.00405 0.018271    0   414 0   0   0   0   1   -360
360;
    217 1179    0.00101 0.00462 0   300 0   0   0   0   1   -360
360;
    217 2575    0.00088 0.00389 0   319 0   0   0   0   1   -360
360;
    217 7274    0.005081    0.039   0   414 0   0   0   0   1   -360
360;
    7972    8189    0.00257 0.0208  0   453 0   0   0   0   1   -360
360;
    7972    8189    0.00251 0.01926 0   414 0   0   0   0   1   -360
360;
    7972    1039    0.002531    0.01314 0   0   0   0   0   0   1   -
360    360;
    7253    7840    0.00132 0.00869 0   0   0   0   0   0   1   -360
360;
    4395    8913    0.00082 0.004021    0   319 0   0   0   0   1   -
360    360;
    4395    4852    0.00143 0.007479    0   338 0   0   0   0   1   -
360    360;
    2795    1183    0.000659    0.005771    0   0   0   0   0   0   1
-360    360;
    2795    1183    0.000591    0.006539    0   0   0   0   0   0   1
-360    360;
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360    360;
    1305    6982    0.00614 0.02343 0   338 0   0   0   0   1   -360
360;
    2732    1798    0.00155 0.01994 0   1381    0   0   0   0   1   -
360    360;
    2732    3346    0.00205 0.03218 0   1480    0   0   0   0   1   -
360    360;
    4550    3346    0.00233 0.03154 0   1480    0   0   0   0   1   -
360    360;
    4725    5738    0.002341    0.01982 0   0   0   0   0   0   1   -
360    360;
    1083    8310    8.1e-05 0.000521    0   433 0   0   0   0   1   -
360    360;
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    1398    5567    9.9e-05 0.00069 0   491 0   0   0   0   1   -360
360;
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360    360;
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360    360;
    7050    3740    0.000229    0.000711    0   414 0   0   0   0   1
-360    360;
    6563    870 0.00013 0.00099 0   414 0   0   0   0   1   -360
360;
    8999    6495    0.001159    0.00689 0   319 0   0   0   0   1   -
360    360;
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360    360;
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-360    360;
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360;
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-360    360;
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360    360;
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360;
    933 6357    0.00825 0.03989 0   319 0   0   0   0   1   -360
360;
    933 3775    0.02187 0.066961    0   0   0   0   0   0   1   -360
360;
    933 3975    0.01212 0.06661 0   0   0   0   0   0   1   -360
360;
    3918    1642    0.00036 0.00534 0   789 0   0   0   0   1   -360
360;
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360    360;
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-360    360;
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360    360;
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-360    360;
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360    360;
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-360    360;
    5237    9108    0.003341    0.016349    0   395 0   0   0   0   1
-360    360;
    5237    1478    0.003271    0.016669    0   357 0   0   0   0   1
-360    360;
    2799    8515    0.000151    0.000659    0   319 0   0   0   0   1
-360    360;
    6405    7873    0.00736 0.035659    0   0   0   0   0   0   1   -
360    360;
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360    360;
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360;
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360;
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360    360;
    2079    772 0.002229    0.01599 0   491 0   0   0   0   1   -360
360;
    2079    772 0.00218 0.01631 0   510 0   0   0   0   1   -360
360;
    1081    6475    0.00238 0.02124 0   953 0   0   0   0   1   -360
360;
    1081    6475    0.00194 0.02023 0   1151    0   0   0   0   1   -
360    360;
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360    360;
    7361    426 0.00876 0.04875 0   319 0   0   0   0   1   -360
360;
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360;
    1364    2430    0.00105 0.00826 0   376 0   0   0   0   1   -360
360;
    2177    749 0.0172  0.06637 0   376 0   0   0   0   1   -360
360;
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360    360;
    6555    3608    0.00208 0.02105 0   1381    0   0   0   0   1   -
360    360;
    8475    1965    0.00614 0.043729    0   376 0   0   0   0   1   -
360    360;
    8475    5926    0.000229    0.001849    0   453 0   0   0   0   1
-360    360;
    5735    6053    0.00386 0.025789    0   338 0   0   0   0   1   -
360    360;
    5735    2341    0.002031    0.012   0   491 0   0   0   0   1   -
360    360;
    2629    7507    0.000591    0.004   0   395 0   0   0   0   1   -
360    360;
    1137    2406    9.1e-05 0.00051 0   0   0   0   0   0   1   -360
360;
    7577    5814    0.00732 0.039969    0   319 0   0   0   0   1   -
360    360;
    7577    3231    0.004581    0.02031 0   529 0   0   0   0   1   -
360    360;
    7663    5814    0.00132 0.00537 0   357 0   0   0   0   1   -360
360;
    1183    1159    0.007521    0.0387  0   376 0   0   0   0   1   -
360    360;
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-360    360;
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360    360;
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360;
    4505    4357    0.00019 0.000909    0   281 0   0   0   0   1   -
360    360;
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360    360;
    6889    9065    8e-05   0.00053 0   657 0   0   0   0   1   -360
360;
    6889    661 8e-05   0.00052 0   657 0   0   0   0   1   -360
360;
    6612    8864    0.000271    0.00151 0   395 0   0   0   0   1   -
360    360;
    8931    6199    0.00053 0.00585 0   1809    0   0   0   0   1   -
360    360;
    8931    6199    0.00047 0.00663 0   1348    0   0   0   0   1   -
360    360;
    8931    6199    0.00046 0.00676 0   1151    0   0   0   0   1   -
360    360;
    8931    6199    0.00045 0.00689 0   1151    0   0   0   0   1   -
360    360;
    8931    8494    0.00028 0.00338 0   1480    0   0   0   0   1   -
360    360;
    8931    8494    0.0003  0.00319 0   1249    0   0   0   0   1   -
360    360;
    1643    4511    0.00025 0.00101 0   376 0   0   0   0   1   -360
360;
    196 1973    0.000281    0.00119 0   0   0   0   0   0   1   -360
360;
    2902    5573    0.00018 0.00063 0   0   0   0   0   0   1   -360
360;
    4950    4410    0.00382 0.02868 0   0   0   0   0   0   1   -360
360;
    4950    333 0.00361 0.0235  0   472 0   0   0   0   1   -360
360;
    4950    6908    0.00538 0.03569 0   0   0   0   0   0   1   -360
360;
    3377    7726    6e-05   0.000409    0   414 0   0   0   0   1   -
360    360;
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360;
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360    360;
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360    360;
    5308    8560    0.0001  0.00109 0   657 0   0   0   0   1   -360
360;
    5308    6427    0.00137 0.01682 0   1677    0   0   0   0   1   -
360    360;
    5308    8347    0.00131 0.01262 0   1414    0   0   0   0   1   -
360    360;
    7148    5610    0.00262 0.019669    0   433 0   0   0   0   1   -
360    360;
    7148    2421    0.00082 0.00526 0   376 0   0   0   0   1   -360
360;
    7148    2421    0.000841    0.005151    0   357 0   0   0   0   1
-360    360;
```

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    44  1545    0.002659    0.02    0   0   0   0   0   0   1   -360
360;
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360;
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360    360;
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360    360;
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360;
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360    360;
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360    360;
    6842    2288    0.000711    0.005969    0   414 0   0   0   0   1
-360    360;
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360;
    1090    1129    0.00869 0.03768 0   300 0   0   0   0   1   -360
360;
    1090    3070    0.001719    0.00837 0   357 0   0   0   0   1   -
360    360;
    8515    5365    0.01582 0.067349    0   338 0   0   0   0   1   -
360    360;
    8515    5365    0.01457 0.06469 0   300 0   0   0   0   1   -360
360;
    8515    4529    0.021711    0.090539    0   281 0   0   0   0   1
-360    360;
    8515    3364    0.00019 0.000729    0   300 0   0   0   0   1   -
360    360;
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360;
    920 6570    3.9e-05 0.0002  0   300 0   0   0   0   1   -360
360;
    6664    4426    0.000281    0.00236 0   529 0   0   0   0   1   -
360    360;
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360    360;
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360;
    6570    8542    0.00049 0.00349 0   319 0   0   0   0   1   -360
360;
    6570    8542    0.000469    0.00331 0   319 0   0   0   0   1   -
360    360;
    6570    1662    0.00313 0.01324 0   0   0   0   0   0   1   -360
360;
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```
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360;
    502 3589    0.00037 0.002849    0   395 0   0   0   0   1   -360
360;
    8473    1040    0.00032 0.00256 0   376 0   0   0   0   1   -360
360;
    8473    145 0.00037 0.00118 0   281 0   0   0   0   1   -360
360;
    8473    4267    0.00068 0.001151    0   0   0   0   0   0   1   -
360    360;
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360    360;
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-360    360;
    9018    4   0.002169    0.00911 0   300 0   0   0   0   1   -360
360;
    9018    4829    0.002849    0.01282 0   357 0   0   0   0   1   -
360    360;
    6253    5383    0.001229    0.01207 0   453 0   0   0   0   1   -
360    360;
    6253    7507    0.001289    0.01089 0   510 0   0   0   0   1   -
360    360;
    8887    1644    0.00093 0.01036 0   756 0   0   0   0   1   -360
360;
    8887    3483    0.00083 0.01174 0   723 0   0   0   0   1   -360
360;
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360    360;
    6639    7840    0.001151    0.009651    0   0   0   0   0   0   1
-360    360;
    5461    8109    0.00101 0.01327 0   1480    0   0   0   0   1   -
360    360;
    6291    4189    0.00364 0.02486 0   472 0   0   0   0   1   -360
360;
    8405    4747    0.00056 0.00425 0   433 0   0   0   0   1   -360
360;
    8405    4580    0.00369 0.02681 0   433 0   0   0   0   1   -360
360;
    338 7824    0.000531    0.00276 0   300 0   0   0   0   1   -360
360;
    2468    7824    0.000521    0.00281 0   281 0   0   0   0   1   -
360    360;
    5257    7824    0.000419    0.00232 0   0   0   0   0   0   1   -
360    360;
    2189    7824    0.000409    0.00237 0   0   0   0   0   0   1   -
360    360;
    8458    8267    0.00014 0.00193 0   1414    0   0   0   0   1   -
360    360;
    2676    5987    0.003211    0.01481 0   319 0   0   0   0   1   -
360    360;
    1187    5712    0.00381 0.01175 0   0   0   0   0   0   1   -360
360;
    1187    6521    0.003781    0.02676 0   319 0   0   0   0   1   -
360    360;
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    2360    8636    0.000919    0.005461    0   453 0   0   0   0   1
-360    360;
    2360    8829    0.000271    0.001211    0   281 0   0   0   0   1
-360    360;
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-360    360;
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360    360;
    2360    4235    0.002531    0.01705 0   491 0   0   0   0   1   -
360    360;
    8818    5099    0.012531    0.05451 0   0   0   0   0   0   1   -
360    360;
    5781    4734    0.00087 0.01212 0   1249    0   0   0   0   1   -
360    360;
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360;
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360    360;
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-360    360;
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-360    360;
    5362    350 0.000281    0.00107 0   338 0   0   0   0   1   -360
360;
    5362    6763    0.00025 0.001091    0   0   0   0   0   0   1   -
360    360;
    3855    1973    0.00019 0.00081 0   529 0   0   0   0   1   -360
360;
    3855    1973    0.00045 0.00136 0   491 0   0   0   0   1   -360
360;
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360    360;
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360    360;
    5460    8222    0.00128 0.0164  0   1611    0   0   0   0   1   -
360    360;
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360    360;
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360    360;
    3786    8578    0.003349    0.02514 0   433 0   0   0   0   1   -
360    360;
    490 2653    0.0003  0.00061 0   0   0   0   0   0   1   -360
360;
    148 7069    0.000289    0.001211    0   414 0   0   0   0   1   -
360    360;
    7256    8743    0.01301 0.044091    0   338 0   0   0   0   1   -
360    360;
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360    360;
    8930    314 0.006461    0.05275 0   414 0   0   0   0   1   -360
360;
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360;
    5627    1742    0.00032 0.00188 0   0   0   0   0   0   1   -360
360;
    5610    6989    0.00105 0.006591    0   376 0   0   0   0   1   -
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360;
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360    360;
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360    360;
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360    360;
    2291    3656    0.002919    0.01912 0   433 0   0   0   0   1   -
360    360;
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360;
    314 5789    0.000901    0.00395 0   0   0   0   0   0   1   -360
360;
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360    360;
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360    360;
    314 5256    0.00375 0.018281    0   319 0   0   0   0   1   -360
360;
    3200    2653    0.00025 0.001031    0   319 0   0   0   0   1   -
360    360;
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360;
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360    360;
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360    360;
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360    360;
    58  221 0.0003  0.00385 0   0   0   0   0   0   1   -360    360;
    6807    851 0.00126 0.008219    0   433 0   0   0   0   1   -360
360;
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360;
    150 3558    0.00201 0.00444 0   0   0   0   0   0   1   -360
360;
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360;
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360    360;
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360    360;
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360    360;
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    7537    3830    0.00051 0.00668 0   1545    0   0   0   0   1   -
360    360;
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360    360;
    1262    1156    0.00245 0.011281    0   376 0   0   0   0   1   -
360    360;
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360;
    1262    4914    0.00105 0.011151    0   0   0   0   0   0   1   -
360    360;
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360    360;
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360;
    1262    3019    0.000711    0.007771    0   0   0   0   0   0   1
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360;
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360;
    1551    7862    0.001091    0.00731 0   472 0   0   0   0   1   -
360    360;
    1551    5458    0.00105 0.007591    0   529 0   0   0   0   1   -
360    360;
    1551    1838    0.00299 0.02256 0   376 0   0   0   0   1   -360
360;
    3070    2888    0.00036 0.00288 0   0   0   0   0   0   1   -360
360;
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360    360;
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360;
    4874    3579    0.00168 0.011969    0   0   0   0   0   0   1   -
360    360;
    4874    7903    0.00289 0.021031    0   338 0   0   0   0   1   -
360    360;
    6368    1102    0.00395 0.025211    0   472 0   0   0   0   1   -
360    360;
    6368    9217    0.002771    0.021659    0   376 0   0   0   0   1
-360    360;
    6368    5653    0.002979    0.016901    0   453 0   0   0   0   1
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360;
    4   1813    0.00361 0.015211    0   338 0   0   0   0   1   -360
360;
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-360    360;
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360    360;
    4426    5616    0.020771    0.080479    0   453 0   0   0   0   1
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    4426    1965    0.00662 0.0513  0   453 0   0   0   0   1   -360
360;
    4426    1767    0.00607 0.04581 0   433 0   0   0   0   1   -360
360;
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360    360;
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-360    360;
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360    360;
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360;
    5395    6816    0.01488 0.06724 0   300 0   0   0   0   1   -360
360;
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    5395    5918    0.00519 0.024   0   338 0   0   0   0   1   -360
360;
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360;
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360    360;
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360;
    5049    306 0.00286 0.02212 0   433 0   0   0   0   1   -360
360;
    718 8397    0.00351 0.02175 0   414 0   0   0   0   1   -360
360;
    718 6982    0.008401    0.0448  0   472 0   0   0   0   1   -360
360;
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360;
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360;
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360;
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360;
    6199    1817    0.00023 0.00252 0   657 0   0   0   0   1   -360
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360;
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360;
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360;
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360;
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360    360;
    3912    8877    0.00111 0.00664 0   338 0   0   0   0   1   -360
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360    360;
    7520    8222    0.00064 0.00854 0   1447    0   0   0   0   1   -
360    360;
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360    360;
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360    360;
    4562    7702    0.00262 0.01168 0   319 0   0   0   0   1   -360
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-360    360;
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360;
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360    360;
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360    360;
    2689    5753    0.00056 0.003531    0   0   0   0   0   0   1   -
360    360;
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360    360;
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360    360;
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360    360;
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360;
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360    360;
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360    360;
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360    360;
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360    360;
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360;
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360    360;
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360;
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360    360;
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360;
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360;
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360;
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360    360;
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360;
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360    360;
    2815    4914    0.00037 0.000659    0   0   0   0   0   0   1   -
360    360;
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360    360;
    163 3498    0.00375 0.019729    0   395 0   0   0   0   1   -360
360;
    163 2430    0.00518 0.020021    0   338 0   0   0   0   1   -360
360;
    7943    9108    0.000771    0.003711    0   395 0   0   0   0   1
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360    360;
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360    360;
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360    360;
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360    360;
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360    360;
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360;
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360;
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360    360;
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360;
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360    360;
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360    360;
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360;
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    9217    594 0.002781    0.022979    0   300 0   0   0   0   1   -
360    360;
    6351    5393    0.000521    0.00407 0   529 0   0   0   0   1   -
360    360;
    6194    7702    0.008479    0.032841    0   0   0   0   0   0   1
-360    360;
    2503    7491    0.005669    0.02901 0   0   0   0   0   0   1   -
360    360;
    4031    2872    0.001031    0.004099    0   0   0   0   0   0   1
-360    360;
    4031    8043    0.00301 0.018719    0   376 0   0   0   0   1   -
360    360;
    1813    2866    0.00257 0.01713 0   338 0   0   0   0   1   -360
360;
    5365    5417    0.010461    0.03836 0   0   0   0   0   0   1   -
360    360;
    5365    4100    0.001719    0.011531    0   414 0   0   0   0   1
-360    360;
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360;
    3894    3865    0.00476 0.025289    0   0   0   0   0   0   1   -
360    360;
    128 1554    0.000219    0.00164 0   319 0   0   0   0   1   -360
360;
    198 7994    0.002159    0.01163 0   0   0   0   0   0   1   -360
360;
    198 1554    0.00295 0.01539 0   300 0   0   0   0   1   -360
360;
    2985    3133    0.007789    0.033039    0   300 0   0   0   0   1
-360    360;
    7316    3071    0.00026 0.0013  0   0   0   0   0   0   1   -360
360;
    6486    8992    0.00162 0.013229    0   338 0   0   0   0   1   -
360    360;
    8485    594 0.007919    0.04194 0   338 0   0   0   0   1   -360
360;
    682 8477    0.001229    0.00401 0   300 0   0   0   0   1   -360
360;
    5146    5488    0.008021    0.042831    0   338 0   0   0   0   1
-360    360;
    6638    776 0.007711    0.03006 0   338 0   0   0   0   1   -360
360;
    8788    789 0.00261 0.015469    0   319 0   0   0   0   1   -360
360;
    6332    1556    0.00139 0.00536 0   0   0   0   0   0   1   -360
360;
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360    360;
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    1883    2132    0.011031    0.05625 0   0   0   0   0   0   1   -
360    360;
    171 2341    0.001841    0.01324 0   472 0   0   0   0   1   -360
360;
    6630    10  0.000599    0.00186 0   453 0   0   0   0   1   -360
360;
    4484    4239    0.00036 0.001591    0   433 0   0   0   0   1   -
360    360;
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-360    360;
    851 4454    0.00186 0.00874 0   491 0   0   0   0   1   -360
360;
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360    360;
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360    360;
    1156    1233    6e-05   0.00039 0   453 0   0   0   0   1   -360
360;
    8913    4852    0.002159    0.008909    0   357 0   0   0   0   1
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360    360;
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360    360;
    4914    2653    0.00011 0.00049 0   300 0   0   0   0   1   -360
360;
    4914    556 0.000771    0.003789    0   338 0   0   0   0   1   -
360    360;
    4914    3019    0.000229    0.002849    0   0   0   0   0   0   1
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360    360;
    1709    8468    0.00074 0.00865 0   1118    0   0   0   0   1   -
360    360;
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    7702    8035    0.003   0.01631 0   0   0   0   0   0   1   -360
360;
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360    360;
    3133    8477    0.002581    0.01814 0   414 0   0   0   0   1   -
360    360;
    6744    6101    0.00201 0.012219    0   433 0   0   0   0   1   -
360    360;
    8542    4313    0.00087 0.001599    0   0   0   0   0   0   1   -
360    360;
    769 5233    0.00455 0.02394 0   319 0   0   0   0   1   -360
360;
```

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    1965    5926    0.005651    0.041771    0   357 0   0   0   0   1
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360;
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360;
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360    360;
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360    360;
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360;
    5004    5393    0.000409    0.0018  0   0   0   0   0   0   1   -
360    360;
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360;
    9150    3906    3e-05   0.0004  0   1710    0   0   0   0   1   -
360    360;
    280 9158    0.00968 0.056659    0   357 0   0   0   0   1   -360
360;
    8043    3656    0.003969    0.02925 0   0   0   0   0   0   1   -
360    360;
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360;
    5712    8466    0.000401    0.003159    0   376 0   0   0   0   1
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360;
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    8807    8992    0.000841    0.006409    0   357 0   0   0   0   1
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    8807    8992    0.00045 0.00506 0   0   0   0   0   0   1   -360
360;
    218 2088    0.003669    0.02988 0   395 0   0   0   0   1   -360
360;
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360;
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360;
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360    360;
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360;
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360;
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360;
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360    360;
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360    360;
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360;
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360    360;
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    401 1584    0.00011 0.000289    0   395 0   0   0   0   1   -360
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360;
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360;
    6921    432 0.0004  0.00756 0   1611    0   0   0   0   1   -360
360;
    6921    432 0.00039 0.00771 0   1447    0   0   0   0   1   -360
360;
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360    360;
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360;
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360;
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360;
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360;
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360    360;
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360    360;
    115 225 0.00068 0.00387 0   491 0   0   0   0   1   -360    360;
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360;
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360;
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360    360;
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360;
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360;
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360    360;
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360;
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360    360;
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360;
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360;
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360    360;
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360    360;
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360    360;
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360;
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360;
    805 8310    0.004039    0.029669    0   491 0   0   0   0   1   -
360    360;
    805 2088    0.001099    0.007771    0   529 0   0   0   0   1   -
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360;
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360    360;
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-360    360;
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360    360;
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360    360;
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360    360;
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360    360;
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360    360;
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360;
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360    360;
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360    360;
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360    360;
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1   -360    360;
    118 2426    0.000365    0.024372    0   591 0   0   0.979227    0
1   -360    360;
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1   -360    360;
    7267    4918    0.000386    0.025673    0   591 0   0   0.93617 0
1   -360    360;
    7267    4918    0.000344    0.029336    0   591 0   0   0.93617 0
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1   -360    360;
    839 4506    0.000767    0.043531    0   0   0   0   0.982143    0
1   -360    360;
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    891 6306    0.00086 0.039291    0   0   0   0   0.982143    0   1
-360    360;
    720 1711    0.000355    0.026586    0   591 0   0   0.93617 0   1
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0   1   -360    360;
    3205    4683    0.000757    0.042649    0   0   0   0   0.982143
0   1   -360    360;
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1   -360    360;
    5350    2361    0.000261    0.030088    0   591 0   0   0.93617 0
1   -360    360;
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0   1   -360    360;
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0   1   -360    360;
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360    360;
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    4494    7284    0.000386    0.025673    0   591 0   0   0.93617 0
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    2656    1775    0.000809    0.042318    0   0   0   0   0.982143
0   1   -360    360;
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0   1   -360    360;
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-360    360;
    2372    367 0.000323    0.025478    0   591 0   0   0.93617 0   1
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    113 7752    0.000355    0.024038    0   591 0   0   0.979227    0
1   -360    360;
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0   1   -360    360;
    3499    7289    0.000757    0.040959    0   0   0   0   0.982143
0   1   -360    360;
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1   -360    360;
    4623    1609    0.000323    0.026354    0   591 0   0   0.93617 0
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0   1   -360    360;
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0   1   -360    360;
    5589    1001    0.000788    0.035217    0   0   0   0   0.982143
0   1   -360    360;
    1198    7473    0.000323    0.026739    0   591 0   0   0.93617 0
1   -360    360;
    1198    7473    0.000323    0.02749 0   591 0   0   0.93617 0   1
-360    360;
    2479    5482    0.000313    0.027324    0   591 0   0   0.93617 0
1   -360    360;
    2479    5482    0.000313    0.028074    0   591 0   0   0.93617 0
1   -360    360;
    7831    5525    0.000601    0.024984    0   0   0   0   0.982143
0   1   -360    360;
    7831    5525    0.000715    0.022797    0   0   0   0   0.982143
0   1   -360    360;
    7831    5525    0.000344    0.024893    0   591 0   0   0.93617 0
1   -360    360;
    4970    7955    0.000365    0.024163    0   591 0   0   0.979227
0   1   -360    360;
    4970    7955    0.000344    0.02385 0   591 0   0   0.979227    0
1   -360    360;
```

```
    5007    7367    0.000757    0.040182    0   0   0   0   0.982143
0   1   -360    360;
    757 3758    0.000323    0.028937    0   591 0   0   0.979227    0
1   -360    360;
    3697    6952    0.000354    0.026958    0   591 0   0   0.93617 0
1   -360    360;
    3697    6952    0.000778    0.045656    0   0   0   0   0.982143
0   1   -360    360;
    3697    6952    0.000695    0.048932    0   0   0   0   0.982143
0   1   -360    360;
    3697    6952    0.000302    0.025926    0   591 0   0   0.93617 0
1   -360    360;
    6738    8180    0.000355    0.027328    0   591 0   0   0.93617 0
1   -360    360;
    6738    8180    0.000365    0.027156    0   591 0   0   0.93617 0
1   -360    360;
    9222    5935    0.000355    0.024299    0   591 0   0   0.979227
0   1   -360    360;
    7988    804 0.000375    0.026313    0   591 0   0   0.93617 0   1
-360    360;
    7988    804 0.000375    0.025605    0   591 0   0   0.93617 0   1
-360    360;
    3239    1539    0.000334    0.026291    0   591 0   0   0.979227
0   1   -360    360;
    3239    1539    0.000705    0.046735    0   0   0   0   0.982143
0   1   -360    360;
    2056    4084    0.000313    0.026875    0   591 0   0   0.979227
0   1   -360    360;
    2056    4084    0.000302    0.027376    0   591 0   0   0.979227
0   1   -360    360;
    4598    5110    0.000664    0.044868    0   0   0   0   0.982143
0   1   -360    360;
    2129    5110    0.000809    0.044526    0   0   0   0   0.982143
0   1   -360    360;
    5658    5550    0.00086 0.034253    0   0   0   0   0.982143    0
1   -360    360;
    5658    5550    0.000355    0.024372    0   591 0   0   0.93617 0
1   -360    360;
    2848    1526    0.000365    0.023788    0   591 0   0   0.93617 0
1   -360    360;
    4541    7464    0.000375    0.023204    0   591 0   0   0.979227
0   1   -360    360;
    4541    7464    0.000302    0.026593    0   591 0   0   0.979227
0   1   -360    360;
    1754    3857    0.000323    0.029256    0   591 0   0   0.93617 0
1   -360    360;
    1754    3857    0.000334    0.029986    0   591 0   0   0.93617 0
1   -360    360;
    1754    3857    0.000355    0.030979    0   591 0   0   0.93617 0
1   -360    360;
    2518    4544    0.000302    0.025707    0   591 0   0   0.93617 0
1   -360    360;
    2518    4544    0.000344    0.025405    0   591 0   0   0.93617 0
1   -360    360;
    3069    6115    0.00012 0.008908    0   491 0   0   0   -0.072388
1   -360    360;
```

```
    5067    7641    0.000365    0.023715    0   591 0   0   0.93617 0
1   -360    360;
    6036    8670    0.000365    0.023517    0   591 0   0   0.979227
0   1   -360    360;
    6036    5522    0.000334    0.026812    0   591 0   0   0.979227
0   1   -360    360;
    8486    8791    0.000695    0.047253    0   0   0   0   0.982143
0   1   -360    360;
    7530    8791    0.000778    0.043759    0   0   0   0   0.982143
0   1   -360    360;
    7522    7571    0.000313    0.030636    0   591 0   0   0.93617 0
1   -360    360;
    7522    7571    0.000313    0.028286    0   591 0   0   0.93617 0
1   -360    360;
    7522    7571    0.000344    0.028115    0   591 0   0   0.93617 0
1   -360    360;
    2526    1483    0.000902    0.039425    0   0   0   0   0.982143
0   1   -360    360;
    2365    8316    0.000355    0.024237    0   591 0   0   0.93617 0
1   -360    360;
    8672    1860    0.000375    0.023986    0   591 0   0   0.93617 0
1   -360    360;
    8672    1860    0.000375    0.023861    0   591 0   0   0.93617 0
1   -360    360;
    1494    583 0.000819    0.04153 0   0   0   0   0.982143    0   1
-360    360;
    1494    583 0.000809    0.042701    0   0   0   0   0.982143    0
1   -360    360;
    1502    2795    0.000334    0.028022    0   591 0   0   0.93617 0
1   -360    360;
    8195    933 0.000632    0.048237    0   0   0   0   0.982143    0
1   -360    360;
    8195    933 0.000632    0.045159    0   0   0   0   0.982143    0
1   -360    360;
    8195    933 0.000715    0.044039    0   0   0   0   0.982143    0
1   -360    360;
    3918    6802    0.00074 0.044479    0   0   0   0   0.986547    0
1   -360    360;
    3918    4025    0.00074 0.043811    0   0   0   0   0.986547    0
1   -360    360;
    4435    2079    0.000375    0.02385 0   591 0   0   0.93617 0   1
-360    360;
    4435    2079    0.000365    0.023267    0   591 0   0   0.93617 0
1   -360    360;
    4435    2079    0.000323    0.026739    0   591 0   0   0.93617 0
1   -360    360;
    1081    7361    0.000684    0.047025    0   0   0   0   0.982143
0   1   -360    360;
    9101    2177    0.000313    0.02748 0   591 0   0   0.93617 0   1
-360    360;
    6555    8475    0.000323    0.028554    0   591 0   0   0.93617 0
1   -360    360;
    6555    8475    0.000302    0.026437    0   591 0   0   0.93617 0
1   -360    360;
    7056    7577    0.000365    0.025551    0   591 0   0   0.93617 0
1   -360    360;
```

```
    7056    7577    0.000344    0.024893    0   591 0   0   0.93617 0
1   -360    360;
    7056    9051    0.000375    0.024508    0   591 0   0   0.979227
0   1   -360    360;
    6889    6785    0.000778    0.041157    0   0   0   0   0.982143
0   1   -360    360;
    6889    6785    0.000923    0.03702 0   0   0   0   0.982143    0
1   -360    360;
    6889    6785    0.000302    0.026593    0   591 0   0   0.979227
0   1   -360    360;
    1027    7148    0.000344    0.029667    0   591 0   0   0.93617 0
1   -360    360;
    1027    44  0.000334    0.02748 0   591 0   0   0.93617 0   1   -
360    360;
    5308    7148    0.000323    0.030636    0   591 0   0   0.89674 0
1   -360    360;
    5308    44  0.000323    0.028526    0   591 0   0   0.93617 0   1
-360    360;
    9213    6231    0.000344    0.025332    0   591 0   0   0.979227
0   1   -360    360;
    9213    8291    0.000334    0.024674    0   591 0   0   0.979227
0   1   -360    360;
    9213    6842    0.000344    0.02457 0   591 0   0   0.979227    0
1   -360    360;
    3608    6664    0.000365    0.023788    0   591 0   0   0.93617 0
1   -360    360;
    4339    6570    0.000365    0.023601    0   591 0   0   0.93617 0
1   -360    360;
    4339    6570    0.000344    0.02652 0   591 0   0   0.93617 0   1
-360    360;
    7513    6570    0.000344    0.027272    0   591 0   0   0.93617 0
1   -360    360;
    7513    6570    0.000334    0.027563    0   591 0   0   0.93617 0
1   -360    360;
    8887    6639    0.000313    0.030636    0   591 0   0   0.979227
0   1   -360    360;
    8887    6639    0.000313    0.028286    0   591 0   0   0.979227
0   1   -360    360;
    5461    4816    0.000881    0.036803    0   0   0   0   0.982143
0   1   -360    360;
    5461    4816    0.000902    0.036668    0   0   0   0   0.982143
0   1   -360    360;
    5461    4816    0.000881    0.034014    0   0   0   0   0.982143
0   1   -360    360;
    5460    3786    0.000365    0.026027    0   591 0   0   0.93617 0
1   -360    360;
    5460    3786    0.000386    0.025673    0   591 0   0   0.93617 0
1   -360    360;
    7256    4491    0.00012 0.011186    0   586 0   0   0   0.084507
1   -360    360;
    6153    58  0.00017 0.006789    0   1216    0   0   0   -0.086984
1   -360    360;
    6153    6807    0.000664    0.047107    0   0   0   0   0.982143
0   1   -360    360;
    1465    1262    0.000313    0.028314    0   591 0   0   0.93617 0
1   -360    360;
```

```
    1465    1262    0.000334    0.025707    0   591 0   0   0.93617 0
1   -360    360;
    1465    1551    0.000344    0.025478    0   591 0   0   0.93617 0
1   -360    360;
    7537    1551    0.000344    0.027236    0   591 0   0   0.93617 0
1   -360    360;
    7537    1551    0.000375    0.026518    0   591 0   0   0.93617 0
1   -360    360;
    6901    4874    0.000386    0.02646 0   591 0   0   0.93617 0   1
-360    360;
    5241    4   0.000788    0.040317    0   0   0   0   0.982143    0
1   -360    360;
    7520    561 0.000323    0.025863    0   591 0   0   0.979227    0
1   -360    360;
    749 4324    1e-05   0.022863    0   948 0   0   0   0.04898 1   -
360    360;
    4141    7124    0.000334    0.030306    0   591 0   0   0.93617 0
1   -360    360;
    4141    7124    0.000302    0.030636    0   591 0   0   0.93617 0
1   -360    360;
    7466    3649    0.00011 0.010476    0   472 0   0   0   -0.06138
1   -360    360;
    8222    6556    0.000344    0.024841    0   591 0   0   0.979227
0   1   -360    360;
    8222    6556    0.000365    0.025029    0   591 0   0   0.979227
0   1   -360    360;
    8222    6556    0.000355    0.024101    0   591 0   0   0.979227
0   1   -360    360;
    4125    163 0.000344    0.02385 0   591 0   0   0.93617 0   1   -
360    360;
    4125    163 0.000411    0.02313 0   591 0   0   0.93617 0   1   -
360    360;
    4125    163 0.000829    0.042764    0   0   0   0   0.982143    0
1   -360    360;
    5837    9217    0.000705    0.04748 0   0   0   0   0.982143    0
1   -360    360;
    5837    1448    0.000323    0.029986    0   591 0   0   0.93617 0
1   -360    360;
    5837    1448    0.000302    0.029952    0   591 0   0   0.93617 0
1   -360    360;
    8267    5365    0.000746    0.041064    0   0   0   0   0.982143
0   1   -360    360;
    8267    5365    0.000881    0.042214    0   0   0   0   0.982143
0   1   -360    360;
    2359    8005    0.00086 0.041209    0   0   0   0   0.982143    0
1   -360    360;
    2359    8005    0.000912    0.038669    0   0   0   0   0.982143
0   1   -360    360;
    8109    171 0.000375    0.026244    0   591 0   0   0.979227    0
1   -360    360;
    8109    171 0.000375    0.025457    0   591 0   0   0.979227    0
1   -360    360;
    3485    1156    0.000302    0.029096    0   591 0   0   0.93617 0
1   -360    360;
    4734    2229    0.000302    0.029667    0   591 0   0   0.93617 0
1   -360    360;
```

```
    1709    7702    0.000334    0.027563    0   591 0   0   0.979227
0   1   -360    360;
    1709    7702    0.000323    0.028074    0   591 0   0   0.979227
0   1   -360    360;
    905 8189    0.000736    0.041064    0   0   0   0   0.982143    0
1   -360    360;
    8334    8189    0.001234    0.040109    0   0   0   0   0.982143
0   1   -360    360;
    8334    8189    0.000757    0.043209    0   0   0   0   0.982143
0   1   -360    360;
    7998    6734    0.000323    0.026586    0   854 0   0   0.93617 0
1   -360    360;
    4196    280 0.000788    0.040296    0   0   0   0   0.982143    0
1   -360    360;
    4196    280 0.000912    0.040514    0   0   0   0   0.982143    0
1   -360    360;
    6475    3503    0.000798    0.042183    0   0   0   0   0.982143
0   1   -360    360;
    6475    3503    0.000778    0.043147    0   0   0   0   0.982143
0   1   -360    360;
    7328    4235    0.000323    0.027793    0   591 0   0   0.93617 0
1   -360    360;
    7328    4235    0.000302    0.027918    0   591 0   0   0.93617 0
1   -360    360;
    7328    4235    0.000302    0.025926    0   591 0   0   0.93617 0
1   -360    360;
    6921    2949    0.000344    0.024956    0   591 0   0   0.979227
0   1   -360    360;
    6921    2949    0.000355    0.024435    0   591 0   0   0.979227
0   1   -360    360;
    3830    306 0.000386    0.026392    0   591 0   0   0.93617 0   1
-360    360;
    5648    306 0.000365    0.025525    0   591 0   0   0.93617 0   1
-360    360;
    1730    115 0.000344    0.029986    0   591 0   0   0.93617 0   1
-360    360;
    1730    115 0.000323    0.029838    0   591 0   0   0.93617 0   1
-360    360;
    2721    5720    0.000323    0.02748 0   591 0   0   0.93617 0   1
-360    360;
    2721    5720    0.000313    0.028001    0   591 0   0   0.93617 0
1   -360    360;
    432 3246    0.000179    0.012988    0   1151    0   0   0.990991
0   1   -360    360;
    432 8846    0.000198    0.012724    0   1151    0   0   0.990991
0   1   -360    360;
    432 2393    0.000207    0.012469    0   1151    0   0   0.990991
0   1   -360    360;
    432 1895    0.000207    0.012206    0   1151    0   0   0.990991
0   1   -360    360;
    432 3412    0.000217    0.012912    0   1151    0   0   0.990991
0   1   -360    360;
    432 5586    0.000217    0.012627    0   1151    0   0   0.990991
0   1   -360    360;
    432 3112    0.000198    0.014317    0   1151    0   0   0.990991
0   1   -360    360;
```

```
    432 3112    0.000189    0.014592    0   1151    0   0   0.990991
0   1   -360    360;
    432 7857    0.000354    0.02725 0   591 0   0   0.979227    0   1
-360    360;
    960 8497    0.000628    0.042428    0   0   0   0   1.009174    0
1   -360    360;
    960 8497    0.000726    0.044039    0   0   0   0   0.982143    0
1   -360    360;
    3577    5907    0.000365    0.024893    0   591 0   0   0.979227
0   1   -360    360;
    3577    5907    0.000438    0.02457 0   591 0   0   0.979227    0
1   -360    360;
    3577    5907    0.000365    0.023986    0   591 0   0   0.979227
0   1   -360    360;
    7164    5918    0.000375    0.023267    0   591 0   0   0.979227
0   1   -360    360;
    7164    5918    0.000323    0.026375    0   591 0   0   0.93617 0
1   -360    360;
    1798    2467    0.000334    0.029735    0   591 0   0   0.93617 0
1   -360    360;
    1798    2467    0.000313    0.030237    0   591 0   0   0.93617 0
1   -360    360;
    3346    2132    0.000767    0.044049    0   0   0   0   0.982143
0   1   -360    360;
    3346    2132    0.000302    0.026072    0   591 0   0   0.93617 0
1   -360    360;
    3346    2132    0.00085 0.039892    0   0   0   0   0.982143    0
1   -360    360;
    3483    8992    0.000344    0.024956    0   591 0   0   0.979227
0   1   -360    360;
    8886    8992    0.000334    0.026666    0   591 0   0   0.93617 0
1   -360    360;
    2093    805 0.000365    0.023788    0   591 0   0   0.93617 0   1
-360    360;
    2093    805 0.000365    0.023465    0   591 0   0   0.93617 0   1
-360    360;
    221 1541    0.000334    0.026447    0   591 0   0   0.93617 0   1
-360    360;
    8347    5383    0.000323    0.027042    0   591 0   0   0.93617 0
1   -360    360;
    8347    5383    0.000313    0.02748 0   591 0   0   0.93617 0   1
-360    360;
    8347    5383    0.000302    0.028314    0   591 0   0   0.93617 0
1   -360    360;
    8347    7507    0.000323    0.025853    0   591 0   0   0.93617 0
1   -360    360;
    8347    7507    0.000365    0.026197    0   591 0   0   0.93617 0
1   -360    360;
    8347    7507    0.000365    0.025165    0   591 0   0   0.93617 0
1   -360    360;
    4000    4852    0.000355    0.024237    0   591 0   0   0.979227
0   1   -360    360;
    4000    2012    0.000375    0.024247    0   591 0   0   0.93617 0
1   -360    360;
    2183    4852    0.000365    0.023267    0   591 0   0   0.979227
0   1   -360    360;
```

```
    2183    2012    0.000342    0.023139    0   591 0   0   0.982143
0   1   -360    360;
    1642    7098    0.000344    0.026666    0   591 0   0   0.979227
0   1   -360    360;
    1642    687 0.000334    0.027021    0   591 0   0   0.93617 0   1
-360    360;
    809 7098    0.000302    0.027615    0   591 0   0   0.979227    0
1   -360    360;
    809 687 0.000313    0.026135    0   591 0   0   0.93617 0   1   -
360    360;
    4594    8804    0.000365    0.025905    0   591 0   0   0.93617 0
1   -360    360;
    4594    8804    0.000355    0.025238    0   591 0   0   0.93617 0
1   -360    360;
    2919    4215    0.000334    0.026814    0   591 0   0   0.93617 0
1   -360    360;
];

%%-----  OPF Data  -----%%
%% generator cost data
%   1   startup shutdown    n   x1  y1  ... xn  yn
%   2   startup shutdown    n   c(n-1)  ... c0
mpc.gencost = [
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
    2   0   0   3   0   1   0;
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