POWER / LOAD FLOW Using Newton Raphson Method

Sytem description and Variable definitions

```
nBuses = 118

bus_data = 118×6
    3.0000   -0.5100   -0.2700    0.9550         0         0
    2.0000   -0.2000   -0.0900         0         0         0
    2.0000   -0.3900   -0.1000         0         0         0
    3.0000   -0.3900   -0.1200    0.9980         0         0
    2.0000         0         0         0         0   -0.4000
    3.0000   -0.5200   -0.2200    0.9900         0         0
    2.0000   -0.1900   -0.0200         0         0         0
    3.0000   -0.2800         0    1.0150         0         0
    2.0000         0         0         0         0         0
    3.0000    4.5000         0    1.0500         0         0
      ⋮

line_data = 186×5
    1.0000    2.0000    0.0303    0.0999    0.0127
    1.0000    3.0000    0.0129    0.0424    0.0054
    4.0000    5.0000    0.0018    0.0080    0.0010
    3.0000    5.0000    0.0241    0.1080    0.0142
    5.0000    6.0000    0.0119    0.0540    0.0071
    6.0000    7.0000    0.0046    0.0208    0.0027
    8.0000    9.0000    0.0024    0.0305    0.5810
    8.0000    5.0000         0    0.0267         0
    9.0000   10.0000    0.0026    0.0322    0.6150
    4.0000   11.0000    0.0209    0.0688    0.0087
      ⋮

-----------------------------------------------------Admittance Matrix-----------------------------------------------------
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Main Function

```
Ybus = 118×118 complex
10^2 ×
   0.0935 - 0.3074i  -0.0278 + 0.0917i  -0.0657 + 0.2159i   0.0000 + 0.0000i ···
  -0.0278 + 0.0917i   0.0729 - 0.2401i   0.0000 + 0.0000i   0.0000 + 0.0000i
  -0.0657 + 0.2159i   0.0000 + 0.0000i   0.1027 - 0.3609i   0.0000 + 0.0000i
   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i   0.3040 - 1.3280i
   0.0000 + 0.0000i   0.0000 + 0.0000i  -0.0197 + 0.0882i  -0.2636 + 1.1950i
   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i
   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i
   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i
   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i
   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i   0.0000 + 0.0000i
      ⋮

-----------------------------------------------------Load Flow Report-----------------------------------------------------

-----------------------------------------------------Iteration Table with voltage on each bus-----------------------------------------------------

    Number_of_Iteration      Error          V1               V2                V3                V4                V5               V6               V7               V8               V9
    ___________________    __________    _____________    ______________    ______________    _____________    ______________    ____________    ______________    _____________    ______________

             1                 5.8894    0.955<0°         1<0°              1<0°              0.998<0°         1<0°              0.99<0°         1<0°              1.015<0°         1<0°
             2                0.80712    0.955<-18.06°    0.9723<-18.39°    0.969<-18.04°     0.998<-14.4°     1<-13.96°         0.99<-16.51°    0.9895<-17.11°    1.015<-9.066°    1.055<-1.669°
             3               0.050005    0.955<-19.4°     0.9713<-18.86°    0.967<-18.51°     0.998<-14.79°    0.9992<-14.31°    0.99<-17.08°    0.9893<-17.53°    1.015<-9.191°    1.042<-2.037°
             4                0.02286    0.955<-18.64°    0.9715<-18.09°    0.9671<-17.74°    0.998<-14°       0.9991<-13.51°    0.99<-16.29°    0.9894<-16.74°    1.015<-8.371°    1.043<-1.077°
             5               0.015873    0.955<-19.2°     0.9713<-18.67°    0.9669<-18.31°    0.998<-14.6°     0.9991<-14.11°    0.99<-16.89°    0.9893<-17.34°    1.015<-8.999°    1.043<-1.774°
             6               0.011345    0.955<-18.8°     0.9714<-18.26°    0.9671<-17.9°     0.998<-14.17°    0.9991<-13.68°    0.99<-16.46°    0.9893<-16.91°    1.015<-8.547°    1.043<-1.273°
             7              0.0080275    0.955<-19.09°    0.9714<-18.55°    0.9669<-18.19°    0.998<-14.47°    0.9991<-13.99°    0.99<-16.77°    0.9893<-17.22°    1.015<-8.868°    1.043<-1.628°
             8               0.005706    0.955<-18.88°    0.9714<-18.34°    0.967<-17.99°     0.998<-14.26°    0.9991<-13.77°    0.99<-16.55°    0.9893<-17°       1.015<-8.64°     1.043<-1.376°
             9              0.0040408    0.955<-19.03°    0.9714<-18.49°    0.967<-18.13°     0.998<-14.41°    0.9991<-13.92°    0.99<-16.71°    0.9893<-17.15°    1.015<-8.802°    1.043<-1.555°
            10              0.0028683    0.955<-18.93°    0.9714<-18.39°    0.967<-18.03°     0.998<-14.3°     0.9991<-13.81°    0.99<-16.6°     0.9893<-17.05°    1.015<-8.687°    1.043<-1.428°
            11              0.0020324    0.955<-19°       0.9714<-18.46°    0.967<-18.1°      0.998<-14.38°    0.9991<-13.89°    0.99<-16.67°    0.9893<-17.12°    1.015<-8.768°    1.043<-1.518°
            12              0.0014419    0.955<-18.95°    0.9714<-18.41°    0.967<-18.05°     0.998<-14.32°    0.9991<-13.84°    0.99<-16.62°    0.9893<-17.07°    1.015<-8.711°    1.043<-1.454°
            13              0.0010221    0.955<-18.98°    0.9714<-18.45°    0.967<-18.09°     0.998<-14.36°    0.9991<-13.88°    0.99<-16.66°    0.9893<-17.11°    1.015<-8.752°    1.043<-1.499°
            14             0.00072495    0.955<-18.96°    0.9714<-18.42°    0.967<-18.06°     0.998<-14.33°    0.9991<-13.85°    0.99<-16.63°    0.9893<-17.08°    1.015<-8.723°    1.043<-1.467°
            15             0.00051396    0.955<-18.98°    0.9714<-18.44°    0.967<-18.08°     0.998<-14.35°    0.9991<-13.87°    0.99<-16.65°    0.9893<-17.1°     1.015<-8.743°    1.043<-1.49°
            16              0.0003645    0.955<-18.96°    0.9714<-18.42°    0.967<-18.07°     0.998<-14.34°    0.9991<-13.85°    0.99<-16.64°    0.9893<-17.08°    1.015<-8.729°    1.043<-1.474°
            17             0.00025844    0.955<-18.97°    0.9714<-18.43°    0.967<-18.08°     0.998<-14.35°    0.9991<-13.86°    0.99<-16.65°    0.9893<-17.09°    1.015<-8.739°    1.043<-1.485°
            18             0.00018327    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.34°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.732°    1.043<-1.477°
            19             0.00012995    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.35°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.737°    1.043<-1.483°
            20             9.2149e-05    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.34°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.733°    1.043<-1.479°
            21             6.5341e-05    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.35°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.736°    1.043<-1.482°
            22             4.6334e-05    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.34°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.734°    1.043<-1.48°
            23             3.2855e-05    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.35°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.735°    1.043<-1.481°
            24             2.3297e-05    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.35°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.734°    1.043<-1.48°
            25              1.652e-05    0.955<-18.97°    0.9714<-18.43°    0.967<-18.07°     0.998<-14.35°    0.9991<-13.86°    0.99<-16.64°    0.9893<-17.09°    1.015<-8.735°    1.043<-1.481°
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-----------------------------------------------Line Data Updated -----------------------------------------------

    From Bus    To Bus    Resistance    Reactance    Shunt Reactance    Line Current Mag    Line Current Angle    Power Loss
    ________    ______    __________    _________    _______________    ________________    __________________    __________

        1          2         0.0303       0.0999          0.0127             0.17937              -62.924         0.00016468
        1          3         0.0129       0.0424         0.00541             0.43419              -40.133         7.2254e-05
        4          5        0.00176      0.00798         0.00105              1.0435              -8.9904         3.2325e-06
        3          5         0.0241        0.108          0.0142             0.71428               -27.33         0.00041486
        5          6         0.0119        0.054         0.00713             0.88855               166.52         0.00012583
        6          7        0.00459       0.0208         0.00275             0.36487               170.62         7.6871e-06
        8          9        0.00244       0.0305           0.581              4.3512              -12.614         2.5905e-05
        8          5              0       0.0267               0               3.425               158.69                  0
        9         10        0.00258       0.0322           0.615              4.2887               3.9671         2.8547e-05
        4         11         0.0209       0.0688         0.00874             0.64833               164.51          0.0002832
        5         11         0.0203       0.0682         0.00869             0.77314               165.88          0.0003186
       11         12        0.00595       0.0196         0.00251             0.51827              -149.49         1.8348e-05
        2         12         0.0187       0.0616         0.00786             0.38834              -49.152          0.0001358
        3         12         0.0484         0.16          0.0203             0.15138               -66.35         0.00035461
        7         12        0.00862        0.034         0.00437             0.18055              -176.96         1.3416e-05
       11         13        0.02225       0.0731         0.00938             0.37924               144.17         0.00018775
       12         14         0.0215       0.0707         0.00908             0.19103               152.08         8.8305e-05
       13         15         0.0744       0.2444         0.03134            0.015714              -149.68         8.6984e-05
       14         15         0.0595        0.195          0.0251            0.072242               111.31         0.00025576
       12         16         0.0212       0.0834          0.0107             0.10483               121.15         4.7114e-05
       15         17         0.0132       0.0437          0.0222              1.0755              -25.648         0.00018739
       16         17         0.0454       0.1801          0.0233             0.17544              -17.574         0.00036161
       17         18         0.0123       0.0505         0.00649               0.829               152.03         0.00012542
       18         19        0.01119       0.0493         0.00571              0.2682               120.12         3.3583e-05
       19         20         0.0252        0.117          0.0149             0.12917               13.002         8.2028e-05
       15         19          0.012       0.0394         0.00505               0.205               106.99          2.952e-05
       20         21         0.0183       0.0849          0.0108             0.30488              -6.5716          0.0001021
       21         22         0.0209        0.097          0.0123             0.44686              -17.542          0.0001952
       22         23         0.0342        0.159          0.0202             0.55134              -18.903         0.00064487
       23         24         0.0135       0.0492          0.0249             0.15372               114.12         2.8016e-05
       23         25         0.0156         0.08          0.0432              1.6404              -16.421         0.00039922
       26         25              0       0.0382               0              1.2657              -134.54                  0
       25         27         0.0318        0.163          0.0882              1.4177               162.67          0.0014337
       27         28        0.01913       0.0855          0.0108             0.33939               164.86          0.0001242
       28         29         0.0237       0.0943          0.0119             0.17219              -176.86         9.6715e-05
       30         17              0       0.0388               0               2.354               155.55                  0
        8         30        0.00431       0.0504           0.257             0.72691               164.99         1.3503e-05
       26         30        0.00799        0.086           0.454              2.2069               177.99         0.00014089
       17         31         0.0474       0.1563         0.01995             0.18481               127.95         0.00041522
       29         31         0.0108       0.0331         0.00415             0.12254               -61.47         1.4294e-05
       23         32         0.0317       0.1153         0.05865               0.936               164.53         0.00094057
       31         32         0.0298       0.0985         0.01255             0.33883               7.4478         0.00030089
       27         32         0.0229       0.0755         0.00963             0.13204               153.52         6.9242e-05
       15         33          0.038       0.1244         0.01597            0.078134               171.79         0.00011283
       19         34         0.0752        0.247          0.0316            0.086061              -83.576         0.00048668
       35         36        0.00224       0.0102         0.00134            0.032526              -127.28          1.632e-07
       35         37          0.011       0.0497         0.00659             0.35113              -27.656         4.2487e-05
       33         37         0.0415        0.142          0.0183             0.17709              -43.985         0.00030499
       34         36        0.00871       0.0268         0.00284             0.30993               152.03         2.3513e-05
       34         37        0.00256       0.0094         0.00492             0.95684              -17.356         6.2707e-06
       38         37              0       0.0375               0              2.4815               155.43                  0
       37         39         0.0321        0.106          0.0135              0.5574               160.23         0.00057436
       37         40         0.0593        0.168           0.021             0.44786                167.4          0.0015749
       30         38        0.00464        0.054           0.211             0.62529               160.85         1.3462e-05
       39         40         0.0184       0.0605         0.00776             0.29898               179.98         0.00010122
       40         41         0.0145       0.0487         0.00611             0.16013                150.9         3.3667e-05
       40         42         0.0555        0.183          0.0233             0.12981              -42.269         0.00039984
       41         42          0.041        0.135          0.0172             0.23242              -38.935         0.00039069
       43         44         0.0608       0.2454         0.03034             0.16982               -13.22         0.00062775
       34         43         0.0413       0.1681         0.02113            0.040094                93.62         6.8389e-05
       44         45         0.0224       0.0901          0.0112             0.33873              -4.7508         0.00016996
       45         46           0.04       0.1356          0.0166             0.36861              -17.326         0.00058978
       46         47          0.038        0.127          0.0158             0.30971              -10.736         0.00044722
       46         48         0.0601        0.189          0.0236             0.15053              -24.673         0.00054373
       47         49         0.0191       0.0625         0.00802             0.13533              -56.284         4.9369e-05
       42         49         0.0715        0.323           0.043              1.3313              -13.122          0.0017015
       42         49         0.0715        0.323           0.043              1.3313              -13.122          0.0017015
       45         49         0.0684        0.186          0.0222             0.50331              -14.188          0.0023548
       48         49         0.0179       0.0505         0.00629             0.34367              -3.7123         0.00011011
       49         50         0.0267       0.0752         0.00937             0.54266               155.99         0.00038686
       49         51         0.0486        0.137          0.0171             0.68598               152.56          0.0016203
       51         52         0.0203       0.0588         0.00698              0.3041               152.77         0.00012532
       52         53         0.0405       0.1635         0.02029             0.11584               145.08         0.00019001
       53         54         0.0263        0.122          0.0155              0.1409              -33.856         9.7457e-05
       49         54          0.073        0.289          0.0369             0.80122               148.09          0.0012776
       49         54         0.0869        0.291          0.0365             0.80122               148.09          0.0012776
       54         55         0.0169       0.0707          0.0101            0.078329                146.8         2.2371e-05
       54         56        0.00275      0.00955         0.00366             0.20071               151.22         1.5179e-06
       55         56        0.00488       0.0151         0.00187              0.2332              -29.702         5.5536e-06
       56         57         0.0343       0.0966          0.0121             0.25567              -33.886         0.00030079
       50         57         0.0474        0.134          0.0166             0.37484               152.24         0.00084217
       56         58         0.0343       0.0966          0.0121            0.075383              -35.726         8.8687e-05
       51         58         0.0255       0.0719         0.00894             0.19912               154.41         0.00012948
       54         59         0.0503       0.2293          0.0299             0.32132              -23.704         0.00081296
       56         59         0.0825        0.251         0.02845             0.59994              -17.914         0.00099365
       56         59         0.0803        0.239          0.0268             0.59994              -17.914         0.00099365
       55         59        0.04739       0.2158         0.02823             0.36676              -24.429         0.00082368
       59         60         0.0317        0.145          0.0188             0.44447              -3.4802         0.00044665
       59         61         0.0328         0.15          0.0194             0.53106              -2.9729         0.00057134
       60         61        0.00264       0.0135         0.00728              1.1329              -2.1053          7.896e-06
       60         62         0.0123       0.0561         0.00734             0.11885              -39.527         1.7981e-05
       61         62        0.00824       0.0376          0.0049             0.28868              -158.21         1.9601e-05
       63         59              0       0.0386               0              1.5427               163.81                  0
       63         64        0.00172         0.02           0.108              1.5296              -12.224         4.5251e-06
       64         61              0       0.0268               0             0.33185               152.35                  0
       38         65        0.00901       0.0986           0.523              1.8306              -3.4379         0.00014861
       64         65        0.00269       0.0302            0.19              1.8262              -5.7104         1.3214e-05
       49         66          0.018       0.0919          0.0124              2.5813              -6.5829         0.00020909
       49         66          0.018       0.0919          0.0124              2.5813              -6.5829         0.00020909
       62         66         0.0482        0.218          0.0289             0.39981              -27.647         0.00092886
       62         67         0.0258        0.117          0.0155             0.27603              -34.354         0.00018373
       65         66              0        0.037               0              1.2191              -96.317                  0
       66         67         0.0224       0.1015         0.01341             0.54404               156.23         0.00027298
       65         68        0.00138        0.016           0.319             0.49496               -110.2          9.426e-07
       47         69         0.0844       0.2778         0.03546             0.57205               6.0968          0.0040749
       49         69         0.0985        0.324          0.0414             0.47895               8.8788          0.0046469
       68         69              0        0.037               0               1.346               -28.31                  0
       69         70           0.03        0.127           0.061              1.0718               168.25         0.00096464
       24         70        0.00221       0.4115         0.05099            0.065673               9.3773         3.2075e-07
       70         71        0.00882       0.0355         0.00439             0.20805               -151.7         1.6184e-05
       24         72         0.0488        0.196          0.0244            0.059415                95.79         0.00014149
       71         72         0.0446         0.18         0.02222             0.10788               165.55         0.00021459
       71         73        0.00866       0.0454         0.00589             0.11967              -128.41         8.9747e-06
       70         74         0.0401       0.1323         0.01684             0.22187               131.02         0.00035676
       70         75         0.0428        0.141           0.018             0.11831               82.698         0.00021672
       69         75         0.0405        0.122           0.062              1.0985               166.24          0.0018018
       74         75         0.0123       0.0406         0.00517              0.5447               -14.67         8.2407e-05
       76         77         0.0444        0.148          0.0184              0.6778              -26.032          0.0013362
       69         77         0.0309        0.101          0.0519             0.62494                169.3         0.00059669
       75         77         0.0601       0.1999         0.02489             0.36201              -19.249          0.0013076
       77         78        0.00376       0.0124         0.00632             0.46112               167.82         6.5191e-06
       78         79        0.00546       0.0244         0.00324             0.30993              -39.373         9.2395e-06
       77         80          0.017       0.0485          0.0236               1.491              -24.809         0.00017648
       77         80         0.0294        0.105          0.0114               1.491              -24.809         0.00017648
       79         80         0.0156       0.0704         0.00935             0.69785              -27.433         0.00016983
       68         81        0.00175       0.0202           0.404             0.86417              -60.525         2.6465e-06
       81         80              0        0.037               0             0.55439              -37.474                  0
       77         82         0.0298       0.0853         0.04087             0.21682                 79.2         0.00019255
       82         83         0.0112      0.03665         0.01898             0.54629               26.247         6.8527e-05
       83         84         0.0625        0.132          0.0129             0.29925               31.112          0.0011689
       83         85          0.043        0.148          0.0174             0.45605               16.109         0.00084323
       84         85         0.0302       0.0641         0.00617             0.38358               15.676         0.00034984
       85         86          0.035        0.123          0.0138             0.18472              -158.23         0.00022629
       86         87        0.02828       0.2074         0.02225             0.13696              -71.925         0.00010954
       85         88           0.02        0.102          0.0138             0.51947                12.52         0.00020779
       85         89         0.0239        0.173          0.0235             0.72372               4.8379          0.0004134
       88         89         0.0139       0.0712         0.00967              1.0019               4.7116         0.00019358
       89         90         0.0518        0.188          0.0264              1.6822              -169.62         0.00045127
       89         90         0.0238       0.0997           0.053              1.6822              -169.62         0.00045127
       90         91         0.0254       0.0836          0.0107            0.057275               107.77         3.6952e-05
       89         92         0.0099       0.0505          0.0274              2.6385              -169.85         0.00016826
       89         92         0.0393       0.1581          0.0207              2.6385              -169.85         0.00016826
       91         92         0.0387       0.1272         0.01634             0.10175               -27.22         0.00015238
       92         93         0.0258       0.0848          0.0109             0.59191               -165.8           0.000394
       92         94         0.0481        0.158          0.0203             0.54374              -161.99           0.001258
       93         94         0.0223       0.0732         0.00938             0.49156              -156.68         0.00024445
       94         95         0.0132       0.0434         0.00555             0.42417               165.43         7.3907e-05
       80         96         0.0356        0.182          0.0247             0.29167               127.32         0.00036965
       82         96         0.0162        0.053          0.0272             0.10667              -24.869         2.7995e-05
       94         96         0.0269       0.0869          0.0115             0.21861              -157.71         0.00015819
       80         97         0.0183       0.0934          0.0127             0.36354               132.99         0.00012175
       80         98         0.0238        0.108          0.0143             0.29335               159.99         0.00016617
       80         99         0.0454        0.206          0.0273             0.21575               149.12          0.0004447
       92        100         0.0648        0.295          0.0236             0.34907              -151.92          0.0014658
       94        100         0.0178        0.058          0.0302             0.48257              -96.522          0.0001529
```

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    Number_of_Iteration       V10               V11               V12               V13               V14               V15               V16               V17               V18
    ___________________    ____________    ______________    ____________    ______________    ______________    ____________    ______________    ______________    _____________

             1             1.05<0°         1<0°              0.99<0°         1<0°              1<0°              0.97<0°         1<0°              1<0°              0.973<0°
             2             1.05<6.226°     0.9856<-16.94°    0.99<-17.26°    0.9695<-18.27°    0.9839<-18.16°    0.97<-17.93°    0.984<-17.74°     0.9942<-15.97°    0.973<-17.7°
             3             1.05<5.461°     0.9845<-17.36°    0.99<-17.89°    0.9677<-18.73°    0.9835<-18.6°     0.97<-18.88°    0.9825<-18.16°    0.9911<-16.31°    0.973<-18.57°
             4             1.05<6.513°     0.9847<-16.59°    0.99<-17.11°    0.9682<-18°       0.9837<-17.85°    0.97<-18.22°    0.9828<-17.42°    0.991<-15.62°     0.973<-17.91°
             5             1.05<5.801°     0.9844<-17.17°    0.99<-17.7°     0.9676<-18.55°    0.9835<-18.42°    0.97<-18.73°    0.9824<-17.99°    0.9909<-16.14°    0.973<-18.42°
             6             1.05<6.311°     0.9846<-16.75°    0.99<-17.28°    0.9681<-18.15°    0.9836<-18.02°    0.97<-18.37°    0.9827<-17.59°    0.991<-15.77°     0.973<-18.06°
             7             1.05<5.95°      0.9845<-17.05°    0.99<-17.58°    0.9677<-18.43°    0.9835<-18.31°    0.97<-18.62°    0.9825<-17.87°    0.9909<-16.03°    0.973<-18.31°
             8             1.05<6.206°     0.9846<-16.84°    0.99<-17.37°    0.968<-18.23°     0.9836<-18.1°     0.97<-18.44°    0.9826<-17.67°    0.9909<-15.85°    0.973<-18.13°
             9             1.05<6.025°     0.9845<-16.99°    0.99<-17.52°    0.9678<-18.37°    0.9836<-18.25°    0.97<-18.57°    0.9825<-17.81°    0.9909<-15.98°    0.973<-18.26°
            10             1.05<6.154°     0.9846<-16.88°    0.99<-17.41°    0.9679<-18.28°    0.9836<-18.14°    0.97<-18.48°    0.9826<-17.71°    0.9909<-15.88°    0.973<-18.17°
            11             1.05<6.062°     0.9845<-16.96°    0.99<-17.49°    0.9678<-18.35°    0.9836<-18.22°    0.97<-18.55°    0.9825<-17.78°    0.9909<-15.95°    0.973<-18.24°
            12             1.05<6.127°     0.9846<-16.9°     0.99<-17.43°    0.9679<-18.3°     0.9836<-18.16°    0.97<-18.5°     0.9826<-17.73°    0.9909<-15.9°     0.973<-18.19°
            13             1.05<6.081°     0.9846<-16.94°    0.99<-17.47°    0.9679<-18.33°    0.9836<-18.2°     0.97<-18.53°    0.9826<-17.77°    0.9909<-15.94°    0.973<-18.22°
            14             1.05<6.114°     0.9846<-16.91°    0.99<-17.44°    0.9679<-18.31°    0.9836<-18.17°    0.97<-18.51°    0.9826<-17.74°    0.9909<-15.91°    0.973<-18.2°
            15             1.05<6.091°     0.9846<-16.93°    0.99<-17.46°    0.9679<-18.32°    0.9836<-18.19°    0.97<-18.53°    0.9826<-17.76°    0.9909<-15.93°    0.973<-18.22°
            16             1.05<6.107°     0.9846<-16.92°    0.99<-17.45°    0.9679<-18.31°    0.9836<-18.18°    0.97<-18.51°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.2°
            17             1.05<6.095°     0.9846<-16.93°    0.99<-17.46°    0.9679<-18.32°    0.9836<-18.19°    0.97<-18.52°    0.9826<-17.76°    0.9909<-15.93°    0.973<-18.21°
            18             1.05<6.104°     0.9846<-16.92°    0.99<-17.45°    0.9679<-18.31°    0.9836<-18.18°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            19             1.05<6.098°     0.9846<-16.93°    0.99<-17.46°    0.9679<-18.32°    0.9836<-18.19°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            20             1.05<6.102°     0.9846<-16.92°    0.99<-17.45°    0.9679<-18.32°    0.9836<-18.18°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            21             1.05<6.099°     0.9846<-16.93°    0.99<-17.46°    0.9679<-18.32°    0.9836<-18.19°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            22             1.05<6.101°     0.9846<-16.93°    0.99<-17.45°    0.9679<-18.32°    0.9836<-18.18°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            23             1.05<6.1°       0.9846<-16.93°    0.99<-17.46°    0.9679<-18.32°    0.9836<-18.19°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            24             1.05<6.101°     0.9846<-16.93°    0.99<-17.45°    0.9679<-18.32°    0.9836<-18.18°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
            25             1.05<6.1°       0.9846<-16.93°    0.99<-17.46°    0.9679<-18.32°    0.9836<-18.19°    0.97<-18.52°    0.9826<-17.75°    0.9909<-15.92°    0.973<-18.21°
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    Number_of_Iteration       V19               V20               V21               V22               V23               V24              V25              V26                 V27
    ___________________    _____________    ______________    ______________    ______________    ______________    _____________    ____________    ________________    _____________

             1             0.962<0°         1<0°              1<0°              1<0°              1<0°              0.992<0°         1.05<0°         1.015<0°            0.968<0°
             2             0.962<-17.92°    0.9625<-17.68°    0.9656<-16.16°    0.9778<-13.71°    1.004<-8.813°     0.992<-8.782°    1.05<-2.112°    1.015<-0.158°       0.968<-13.91°
             3             0.962<-19.02°    0.957<-18.15°     0.9579<-16.57°    0.9693<-14.05°    0.9998<-9.17°     0.992<-9.242°    1.05<-2.308°    1.015<-0.4596°      0.968<-14.81°
             4             0.962<-18.39°    0.9573<-17.53°    0.9583<-15.96°    0.9695<-13.41°    0.9996<-8.498°    0.992<-8.674°    1.05<-1.519°    1.015<0.3145°       0.968<-14.11°
             5             0.962<-18.88°    0.9567<-18°       0.9574<-16.41°    0.9688<-13.86°    0.9994<-8.948°    0.992<-9.055°    1.05<-2.057°    1.015<-0.1945°      0.968<-14.61°
             6             0.962<-18.54°    0.9571<-17.67°    0.958<-16.09°     0.9692<-13.54°    0.9995<-8.627°    0.992<-8.784°    1.05<-1.673°    1.015<0.1706°       0.968<-14.25°
             7             0.962<-18.78°    0.9568<-17.9°     0.9576<-16.32°    0.9689<-13.77°    0.9994<-8.855°    0.992<-8.976°    1.05<-1.945°    1.015<-0.08803°     0.968<-14.5°
             8             0.962<-18.61°    0.957<-17.74°     0.9579<-16.16°    0.9691<-13.61°    0.9995<-8.693°    0.992<-8.84°     1.05<-1.752°    1.015<0.0956°       0.968<-14.33°
             9             0.962<-18.73°    0.9569<-17.85°    0.9577<-16.27°    0.969<-13.72°     0.9995<-8.807°    0.992<-8.937°    1.05<-1.889°    1.015<-0.03456°     0.968<-14.45°
            10             0.962<-18.64°    0.957<-17.77°     0.9578<-16.19°    0.9691<-13.64°    0.9995<-8.726°    0.992<-8.868°    1.05<-1.792°    1.015<0.05777°      0.968<-14.36°
            11             0.962<-18.7°     0.9569<-17.83°    0.9577<-16.25°    0.969<-13.7°      0.9995<-8.784°    0.992<-8.917°    1.05<-1.861°    1.015<-0.007691°    0.968<-14.43°
            12             0.962<-18.66°    0.957<-17.79°     0.9578<-16.21°    0.9691<-13.65°    0.9995<-8.743°    0.992<-8.882°    1.05<-1.812°    1.015<0.03873°      0.968<-14.38°
            13             0.962<-18.69°    0.9569<-17.82°    0.9577<-16.23°    0.969<-13.68°     0.9995<-8.772°    0.992<-8.907°    1.05<-1.846°    1.015<0.005818°     0.968<-14.41°
            14             0.962<-18.67°    0.957<-17.8°      0.9578<-16.21°    0.969<-13.66°     0.9995<-8.751°    0.992<-8.889°    1.05<-1.822°    1.015<0.02916°      0.968<-14.39°
            15             0.962<-18.69°    0.9569<-17.81°    0.9577<-16.23°    0.969<-13.68°     0.9995<-8.766°    0.992<-8.901°    1.05<-1.839°    1.015<0.01261°      0.968<-14.41°
            16             0.962<-18.67°    0.9569<-17.8°     0.9577<-16.22°    0.969<-13.67°     0.9995<-8.756°    0.992<-8.893°    1.05<-1.827°    1.015<0.02435°      0.968<-14.4°
            17             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.23°    0.969<-13.67°     0.9995<-8.763°    0.992<-8.899°    1.05<-1.836°    1.015<0.01602°      0.968<-14.4°
            18             0.962<-18.68°    0.9569<-17.8°     0.9577<-16.22°    0.969<-13.67°     0.9995<-8.758°    0.992<-8.895°    1.05<-1.829°    1.015<0.02192°      0.968<-14.4°
            19             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.761°    0.992<-8.898°    1.05<-1.834°    1.015<0.01774°      0.968<-14.4°
            20             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.759°    0.992<-8.895°    1.05<-1.831°    1.015<0.02071°      0.968<-14.4°
            21             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.761°    0.992<-8.897°    1.05<-1.833°    1.015<0.0186°       0.968<-14.4°
            22             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.759°    0.992<-8.896°    1.05<-1.831°    1.015<0.0201°       0.968<-14.4°
            23             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.76°     0.992<-8.897°    1.05<-1.832°    1.015<0.01904°      0.968<-14.4°
            24             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.76°     0.992<-8.896°    1.05<-1.832°    1.015<0.01979°      0.968<-14.4°
            25             0.962<-18.68°    0.9569<-17.81°    0.9577<-16.22°    0.969<-13.67°     0.9995<-8.76°     0.992<-8.897°    1.05<-1.832°    1.015<0.01926°      0.968<-14.4°
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    Number_of_Iteration       V28               V29               V30               V31               V32              V33               V34              V35               V36              V37
    ___________________    ______________    ______________    _____________    _____________    _____________    ______________    _____________    ______________    ____________    ______________

             1             1<0°              1<0°              1<0°             0.967<0°         0.963<0°         1<0°              0.984<0°         1<0°              0.98<0°         1<0°
             2             0.9633<-16.06°    0.9647<-17.02°    1.017<-10.89°    0.967<-16.37°    0.963<-14.34°    0.971<-19.01°     0.984<-18.04°    0.9805<-18.77°    0.98<-18.4°     0.989<-17.86°
             3             0.9612<-16.53°    0.963<-17.51°     1.009<-11.2°     0.967<-17.4°     0.963<-15.33°    0.9687<-19.43°    0.984<-18.76°    0.9797<-19.2°     0.98<-19.21°    0.9864<-18.24°
             4             0.9617<-15.84°    0.9633<-16.83°    1.009<-10.47°    0.967<-16.71°    0.963<-14.66°    0.969<-18.85°     0.984<-18.26°    0.9797<-18.7°     0.98<-18.71°    0.9863<-17.73°
             5             0.9615<-16.33°    0.9631<-17.32°    1.009<-11.01°    0.967<-17.21°    0.963<-15.14°    0.9688<-19.3°     0.984<-18.66°    0.9797<-19.1°     0.98<-19.11°    0.9863<-18.14°
             6             0.9616<-15.98°    0.9633<-16.97°    1.009<-10.63°    0.967<-16.85°    0.963<-14.8°     0.969<-18.98°     0.984<-18.38°    0.9797<-18.82°    0.98<-18.83°    0.9863<-17.85°
             7             0.9615<-16.23°    0.9632<-17.22°    1.009<-10.9°     0.967<-17.1°     0.963<-15.04°    0.9688<-19.21°    0.984<-18.58°    0.9797<-19.02°    0.98<-19.03°    0.9863<-18.05°
             8             0.9616<-16.05°    0.9632<-17.04°    1.009<-10.7°     0.967<-16.93°    0.963<-14.87°    0.9689<-19.05°    0.984<-18.43°    0.9797<-18.88°    0.98<-18.89°    0.9863<-17.91°
             9             0.9615<-16.18°    0.9632<-17.17°    1.009<-10.84°    0.967<-17.05°    0.963<-14.99°    0.9688<-19.16°    0.984<-18.54°    0.9797<-18.98°    0.98<-18.99°    0.9863<-18.01°
            10             0.9616<-16.09°    0.9632<-17.08°    1.009<-10.74°    0.967<-16.96°    0.963<-14.91°    0.9689<-19.08°    0.984<-18.46°    0.9797<-18.91°    0.98<-18.92°    0.9863<-17.94°
            11             0.9616<-16.15°    0.9632<-17.14°    1.009<-10.81°    0.967<-17.03°    0.963<-14.97°    0.9689<-19.14°    0.984<-18.52°    0.9797<-18.96°    0.98<-18.97°    0.9863<-17.99°
            12             0.9616<-16.11°    0.9632<-17.1°     1.009<-10.76°    0.967<-16.98°    0.963<-14.92°    0.9689<-19.1°     0.984<-18.48°    0.9797<-18.92°    0.98<-18.93°    0.9863<-17.95°
            13             0.9616<-16.14°    0.9632<-17.13°    1.009<-10.8°     0.967<-17.01°    0.963<-14.96°    0.9689<-19.13°    0.984<-18.51°    0.9797<-18.95°    0.98<-18.96°    0.9863<-17.98°
            14             0.9616<-16.12°    0.9632<-17.11°    1.009<-10.77°    0.967<-16.99°    0.963<-14.93°    0.9689<-19.11°    0.984<-18.49°    0.9797<-18.93°    0.98<-18.94°    0.9863<-17.96°
            15             0.9616<-16.13°    0.9632<-17.12°    1.009<-10.79°    0.967<-17.01°    0.963<-14.95°    0.9689<-19.12°    0.984<-18.5°     0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            16             0.9616<-16.12°    0.9632<-17.11°    1.009<-10.78°    0.967<-16.99°    0.963<-14.94°    0.9689<-19.11°    0.984<-18.49°    0.9797<-18.93°    0.98<-18.94°    0.9863<-17.97°
            17             0.9616<-16.13°    0.9632<-17.12°    1.009<-10.79°    0.967<-17°       0.963<-14.95°    0.9689<-19.12°    0.984<-18.5°     0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            18             0.9616<-16.12°    0.9632<-17.11°    1.009<-10.78°    0.967<-17°       0.963<-14.94°    0.9689<-19.11°    0.984<-18.49°    0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            19             0.9616<-16.13°    0.9632<-17.12°    1.009<-10.79°    0.967<-17°       0.963<-14.94°    0.9689<-19.12°    0.984<-18.5°     0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            20             0.9616<-16.12°    0.9632<-17.12°    1.009<-10.78°    0.967<-17°       0.963<-14.94°    0.9689<-19.11°    0.984<-18.49°    0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            21             0.9616<-16.13°    0.9632<-17.12°    1.009<-10.79°    0.967<-17°       0.963<-14.94°    0.9689<-19.12°    0.984<-18.5°     0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            22             0.9616<-16.12°    0.9632<-17.12°    1.009<-10.78°    0.967<-17°       0.963<-14.94°    0.9689<-19.11°    0.984<-18.49°    0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            23             0.9616<-16.12°    0.9632<-17.12°    1.009<-10.79°    0.967<-17°       0.963<-14.94°    0.9689<-19.12°    0.984<-18.5°     0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            24             0.9616<-16.12°    0.9632<-17.12°    1.009<-10.78°    0.967<-17°       0.963<-14.94°    0.9689<-19.12°    0.984<-18.49°    0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
            25             0.9616<-16.12°    0.9632<-17.12°    1.009<-10.78°    0.967<-17°       0.963<-14.94°    0.9689<-19.12°    0.984<-18.49°    0.9797<-18.94°    0.98<-18.95°    0.9863<-17.97°
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    Number_of_Iteration       V38              V39               V40              V41               V42              V43               V44               V45               V46              V47
    ___________________    _____________    ______________    ____________    ______________    _____________    ______________    ______________    ______________    _____________    _____________

             1             1<0°             1<0°              0.97<0°         1<0°              0.985<0°         1<0°              1<0°              1<0°              1.005<0°         1<0°
             2             1.011<-12.67°    0.9709<-21.14°    0.97<-21.53°    0.968<-22.61°     0.985<-20.7°     0.9794<-18.33°    0.9882<-15.86°    0.9898<-14.05°    1.005<-11.32°    1.019<-9.085°
             3             1.002<-12.98°    0.9684<-21.68°    0.97<-22.78°    0.9664<-23.22°    0.985<-21.62°    0.9768<-18.79°    0.9842<-16.29°    0.9862<-14.46°    1.005<-11.65°    1.017<-9.401°
             4             1.001<-12.43°    0.9684<-21.21°    0.97<-22.33°    0.9669<-22.79°    0.985<-21.2°     0.9774<-18.35°    0.9848<-15.93°    0.9867<-14.13°    1.005<-11.34°    1.017<-9.13°
             5             1.001<-12.84°    0.9683<-21.59°    0.97<-22.7°     0.9668<-23.13°    0.985<-21.52°    0.9769<-18.69°    0.9842<-16.18°    0.9862<-14.35°    1.005<-11.54°    1.017<-9.3°
             6             1.001<-12.55°    0.9684<-21.32°    0.97<-22.44°    0.9669<-22.89°    0.985<-21.3°     0.9773<-18.46°    0.9846<-16.01°    0.9865<-14.19°    1.005<-11.4°     1.017<-9.182°
             7             1.001<-12.76°    0.9683<-21.51°    0.97<-22.62°    0.9668<-23.06°    0.985<-21.45°    0.977<-18.62°     0.9843<-16.13°    0.9863<-14.3°     1.005<-11.5°     1.017<-9.265°
             8             1.001<-12.61°    0.9684<-21.38°    0.97<-22.49°    0.9669<-22.94°    0.985<-21.34°    0.9772<-18.5°     0.9845<-16.05°    0.9865<-14.23°    1.005<-11.43°    1.017<-9.206°
             9             1.001<-12.72°    0.9683<-21.47°    0.97<-22.58°    0.9668<-23.03°    0.985<-21.42°    0.9771<-18.59°    0.9844<-16.11°    0.9864<-14.28°    1.005<-11.48°    1.017<-9.248°
            10             1.001<-12.64°    0.9683<-21.41°    0.97<-22.52°    0.9668<-22.96°    0.985<-21.36°    0.9772<-18.53°    0.9845<-16.06°    0.9864<-14.24°    1.005<-11.44°    1.017<-9.219°
            11             1.001<-12.69°    0.9683<-21.45°    0.97<-22.57°    0.9668<-23.01°    0.985<-21.4°     0.9771<-18.57°    0.9844<-16.1°     0.9864<-14.27°    1.005<-11.47°    1.017<-9.24°
            12             1.001<-12.66°    0.9683<-21.42°    0.97<-22.53°    0.9668<-22.98°    0.985<-21.38°    0.9771<-18.54°    0.9845<-16.07°    0.9864<-14.25°    1.005<-11.45°    1.017<-9.225°
            13             1.001<-12.68°    0.9683<-21.44°    0.97<-22.56°    0.9668<-23°       0.985<-21.39°    0.9771<-18.56°    0.9844<-16.09°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.235°
            14             1.001<-12.66°    0.9683<-21.43°    0.97<-22.54°    0.9668<-22.98°    0.985<-21.38°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.25°    1.005<-11.45°    1.017<-9.228°
            15             1.001<-12.68°    0.9683<-21.44°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.56°    0.9844<-16.09°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.233°
            16             1.001<-12.67°    0.9683<-21.43°    0.97<-22.54°    0.9668<-22.99°    0.985<-21.38°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.25°    1.005<-11.45°    1.017<-9.229°
            17             1.001<-12.68°    0.9683<-21.44°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.56°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.232°
            18             1.001<-12.67°    0.9683<-21.43°    0.97<-22.54°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.45°    1.017<-9.23°
            19             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.231°
            20             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.45°    1.017<-9.23°
            21             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.231°
            22             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.231°
            23             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.231°
            24             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.231°
            25             1.001<-12.67°    0.9683<-21.43°    0.97<-22.55°    0.9668<-22.99°    0.985<-21.39°    0.9771<-18.55°    0.9845<-16.08°    0.9864<-14.26°    1.005<-11.46°    1.017<-9.231°
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    Number_of_Iteration       V48              V49              V50              V51               V52               V53               V54              V55              V56
    ___________________    _____________    _____________    _____________    ______________    ______________    ______________    _____________    _____________    _____________

             1             1<0°             1.025<0°         1<0°             1<0°              1<0°              1<0°              0.955<0°         0.952<0°         0.954<0°
             2             1.021<-9.853°    1.025<-9.065°    1.003<-10.94°    0.9703<-13.53°    0.9605<-14.44°    0.9495<-15.41°    0.955<-13.96°    0.952<-14.22°    0.954<-14.05°
             3             1.021<-10.21°    1.025<-9.212°    1.001<-11.26°    0.9668<-13.88°    0.9566<-14.82°    0.9457<-15.8°     0.955<-14.89°    0.952<-15.18°    0.954<-14.99°
             4             1.021<-9.9°      1.025<-8.898°    1.001<-10.94°    0.967<-13.57°     0.957<-14.53°     0.9461<-15.51°    0.955<-14.6°     0.952<-14.89°    0.954<-14.7°
             5             1.021<-10.1°     1.025<-9.094°    1.001<-11.13°    0.9668<-13.75°    0.9567<-14.7°     0.9459<-15.68°    0.955<-14.77°    0.952<-15.06°    0.954<-14.87°
             6             1.021<-9.96°     1.025<-8.959°    1.001<-11°       0.9669<-13.63°    0.9569<-14.58°    0.946<-15.56°     0.955<-14.65°    0.952<-14.94°    0.954<-14.76°
             7             1.021<-10.06°    1.025<-9.054°    1.001<-11.09°    0.9668<-13.71°    0.9568<-14.67°    0.9459<-15.64°    0.955<-14.74°    0.952<-15.03°    0.954<-14.84°
             8             1.021<-9.988°    1.025<-8.986°    1.001<-11.03°    0.9669<-13.65°    0.9569<-14.61°    0.946<-15.59°     0.955<-14.68°    0.952<-14.97°    0.954<-14.78°
             9             1.021<-10.04°    1.025<-9.034°    1.001<-11.08°    0.9668<-13.7°     0.9568<-14.65°    0.946<-15.63°     0.955<-14.72°    0.952<-15.01°    0.954<-14.82°
            10             1.021<-10°       1.025<-9°        1.001<-11.04°    0.9669<-13.67°    0.9568<-14.62°    0.946<-15.6°      0.955<-14.69°    0.952<-14.98°    0.954<-14.79°
            11             1.021<-10.03°    1.025<-9.024°    1.001<-11.07°    0.9669<-13.69°    0.9568<-14.64°    0.946<-15.62°     0.955<-14.71°    0.952<-15°       0.954<-14.81°
            12             1.021<-10.01°    1.025<-9.007°    1.001<-11.05°    0.9669<-13.67°    0.9568<-14.63°    0.946<-15.6°      0.955<-14.69°    0.952<-14.99°    0.954<-14.8°
            13             1.021<-10.02°    1.025<-9.019°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.64°    0.946<-15.61°     0.955<-14.71°    0.952<-15°       0.954<-14.81°
            14             1.021<-10.01°    1.025<-9.011°    1.001<-11.05°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            15             1.021<-10.02°    1.025<-9.017°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.64°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.81°
            16             1.021<-10.01°    1.025<-9.013°    1.001<-11.05°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            17             1.021<-10.02°    1.025<-9.016°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.81°
            18             1.021<-10.02°    1.025<-9.014°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            19             1.021<-10.02°    1.025<-9.015°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            20             1.021<-10.02°    1.025<-9.014°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            21             1.021<-10.02°    1.025<-9.015°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            22             1.021<-10.02°    1.025<-9.014°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            23             1.021<-10.02°    1.025<-9.015°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            24             1.021<-10.02°    1.025<-9.014°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
            25             1.021<-10.02°    1.025<-9.015°    1.001<-11.06°    0.9669<-13.68°    0.9568<-14.63°    0.946<-15.61°     0.955<-14.7°     0.952<-14.99°    0.954<-14.8°
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    Number_of_Iteration       V57               V58               V59               V60               V61              V62              V63               V64               V65              V66
    ___________________    ______________    ______________    _____________    ______________    _____________    _____________    ______________    ______________    _____________    ____________

             1             1<0°              1<0°              0.985<0°         1<0°              0.995<0°         0.998<0°         1<0°              1<0°              1.005<0°         1.05<0°
             2             0.9726<-13.49°    0.9619<-14.31°    0.985<-10.37°    0.9934<-6.754°    0.995<-5.834°    0.998<-6.483°    0.9944<-7.125°    0.9997<-5.4°      1.005<-2.285°    1.05<-2.634°
             3             0.9706<-13.8°     0.9589<-14.65°    0.985<-10.8°     0.9931<-7.008°    0.995<-6.116°    0.998<-6.733°    0.9927<-7.378°    0.9984<-5.642°    1.005<-2.491°    1.05<-2.677°
             4             0.9706<-13.49°    0.9591<-14.35°    0.985<-10.51°    0.9932<-6.72°     0.995<-5.828°    0.998<-6.441°    0.9926<-7.088°    0.9983<-5.354°    1.005<-2.214°    1.05<-2.368°
             5             0.9705<-13.67°    0.959<-14.52°     0.985<-10.68°    0.9931<-6.886°    0.995<-5.994°    0.998<-6.61°     0.9926<-7.257°    0.9983<-5.52°     1.005<-2.372°    1.05<-2.556°
             6             0.9706<-13.55°    0.9591<-14.4°     0.985<-10.56°    0.9932<-6.771°    0.995<-5.879°    0.998<-6.494°    0.9926<-7.141°    0.9983<-5.405°    1.005<-2.263°    1.05<-2.427°
             7             0.9706<-13.63°    0.959<-14.49°     0.985<-10.65°    0.9931<-6.852°    0.995<-5.96°     0.998<-6.576°    0.9926<-7.222°    0.9983<-5.486°    1.005<-2.34°     1.05<-2.517°
             8             0.9706<-13.57°    0.9591<-14.43°    0.985<-10.59°    0.9932<-6.795°    0.995<-5.903°    0.998<-6.518°    0.9926<-7.164°    0.9983<-5.429°    1.005<-2.285°    1.05<-2.453°
             9             0.9706<-13.61°    0.959<-14.47°     0.985<-10.63°    0.9931<-6.835°    0.995<-5.943°    0.998<-6.559°    0.9926<-7.205°    0.9983<-5.469°    1.005<-2.324°    1.05<-2.499°
            10             0.9706<-13.58°    0.959<-14.44°     0.985<-10.6°     0.9932<-6.807°    0.995<-5.915°    0.998<-6.53°     0.9926<-7.176°    0.9983<-5.441°    1.005<-2.297°    1.05<-2.467°
            11             0.9706<-13.6°     0.959<-14.46°     0.985<-10.62°    0.9932<-6.827°    0.995<-5.935°    0.998<-6.55°     0.9926<-7.197°    0.9983<-5.461°    1.005<-2.316°    1.05<-2.489°
            12             0.9706<-13.59°    0.959<-14.45°     0.985<-10.61°    0.9932<-6.812°    0.995<-5.921°    0.998<-6.536°    0.9926<-7.182°    0.9983<-5.446°    1.005<-2.302°    1.05<-2.473°
            13             0.9706<-13.6°     0.959<-14.46°     0.985<-10.62°    0.9932<-6.823°    0.995<-5.931°    0.998<-6.546°    0.9926<-7.193°    0.9983<-5.457°    1.005<-2.312°    1.05<-2.485°
            14             0.9706<-13.59°    0.959<-14.45°     0.985<-10.61°    0.9932<-6.815°    0.995<-5.924°    0.998<-6.539°    0.9926<-7.185°    0.9983<-5.449°    1.005<-2.305°    1.05<-2.477°
            15             0.9706<-13.6°     0.959<-14.46°     0.985<-10.61°    0.9932<-6.821°    0.995<-5.929°    0.998<-6.544°    0.9926<-7.191°    0.9983<-5.455°    1.005<-2.31°     1.05<-2.482°
            16             0.9706<-13.59°    0.959<-14.45°     0.985<-10.61°    0.9932<-6.817°    0.995<-5.925°    0.998<-6.54°     0.9926<-7.187°    0.9983<-5.451°    1.005<-2.306°    1.05<-2.478°
            17             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.82°     0.995<-5.928°    0.998<-6.543°    0.9926<-7.189°    0.9983<-5.453°    1.005<-2.309°    1.05<-2.481°
            18             0.9706<-13.59°    0.959<-14.45°     0.985<-10.61°    0.9932<-6.818°    0.995<-5.926°    0.998<-6.541°    0.9926<-7.188°    0.9983<-5.452°    1.005<-2.307°    1.05<-2.479°
            19             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.819°    0.995<-5.927°    0.998<-6.542°    0.9926<-7.189°    0.9983<-5.453°    1.005<-2.308°    1.05<-2.481°
            20             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.818°    0.995<-5.926°    0.998<-6.541°    0.9926<-7.188°    0.9983<-5.452°    1.005<-2.308°    1.05<-2.48°
            21             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.819°    0.995<-5.927°    0.998<-6.542°    0.9926<-7.189°    0.9983<-5.453°    1.005<-2.308°    1.05<-2.48°
            22             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.818°    0.995<-5.926°    0.998<-6.542°    0.9926<-7.188°    0.9983<-5.452°    1.005<-2.308°    1.05<-2.48°
            23             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.819°    0.995<-5.927°    0.998<-6.542°    0.9926<-7.188°    0.9983<-5.453°    1.005<-2.308°    1.05<-2.48°
            24             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.818°    0.995<-5.926°    0.998<-6.542°    0.9926<-7.188°    0.9983<-5.452°    1.005<-2.308°    1.05<-2.48°
            25             0.9706<-13.6°     0.959<-14.45°     0.985<-10.61°    0.9932<-6.819°    0.995<-5.927°    0.998<-6.542°    0.9926<-7.188°    0.9983<-5.452°    1.005<-2.308°    1.05<-2.48°
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    Number_of_Iteration       V67              V68              V69          V70              V71               V72              V73              V74              V75               V76
    ___________________    _____________    _____________    _________    _____________    ______________    _____________    _____________    _____________    ______________    _____________

             1             1<0°             1<0°             1.035<0°     0.984<0°         1<0°              0.98<0°          0.991<0°         0.958<0°         1<0°              0.943<0°
             2             1.021<-5.133°    1.013<-2.427°    1.035<0°     0.984<-7.135°    0.987<-7.668°     0.98<-8.635°     0.991<-7.806°    0.958<-7.803°    0.9701<-6.897°    0.943<-7.541°
             3             1.02<-5.319°     1.012<-2.619°    1.035<0°     0.984<-7.519°    0.9868<-7.95°     0.98<-9.141°     0.991<-8.163°    0.958<-8.457°    0.9674<-7.201°    0.943<-8.367°
             4             1.02<-5.018°     1.012<-2.416°    1.035<0°     0.984<-7.334°    0.9868<-7.731°    0.98<-8.761°     0.991<-7.941°    0.958<-8.312°    0.9673<-7.058°    0.943<-8.208°
             5             1.02<-5.195°     1.012<-2.526°    1.035<0°     0.984<-7.444°    0.9868<-7.865°    0.98<-9.008°     0.991<-8.077°    0.958<-8.391°    0.9673<-7.129°    0.943<-8.281°
             6             1.02<-5.073°     1.012<-2.452°    1.035<0°     0.984<-7.368°    0.9868<-7.771°    0.98<-8.833°     0.991<-7.982°    0.958<-8.338°    0.9673<-7.082°    0.943<-8.234°
             7             1.02<-5.159°     1.012<-2.504°    1.035<0°     0.984<-7.422°    0.9868<-7.837°    0.98<-8.957°     0.991<-8.049°    0.958<-8.375°    0.9673<-7.115°    0.943<-8.266°
             8             1.02<-5.098°     1.012<-2.467°    1.035<0°     0.984<-7.384°    0.9868<-7.79°     0.98<-8.869°     0.991<-8.002°    0.958<-8.349°    0.9673<-7.092°    0.943<-8.244°
             9             1.02<-5.141°     1.012<-2.493°    1.035<0°     0.984<-7.411°    0.9868<-7.824°    0.98<-8.931°     0.991<-8.035°    0.958<-8.367°    0.9673<-7.108°    0.943<-8.26°
            10             1.02<-5.111°     1.012<-2.475°    1.035<0°     0.984<-7.391°    0.9868<-7.8°      0.98<-8.887°     0.991<-8.011°    0.958<-8.354°    0.9673<-7.096°    0.943<-8.248°
            11             1.02<-5.132°     1.012<-2.488°    1.035<0°     0.984<-7.405°    0.9868<-7.817°    0.98<-8.918°     0.991<-8.028°    0.958<-8.363°    0.9673<-7.105°    0.943<-8.256°
            12             1.02<-5.117°     1.012<-2.479°    1.035<0°     0.984<-7.395°    0.9868<-7.805°    0.98<-8.896°     0.991<-8.016°    0.958<-8.357°    0.9673<-7.099°    0.943<-8.251°
            13             1.02<-5.128°     1.012<-2.485°    1.035<0°     0.984<-7.402°    0.9868<-7.813°    0.98<-8.912°     0.991<-8.025°    0.958<-8.361°    0.9673<-7.103°    0.943<-8.255°
            14             1.02<-5.12°      1.012<-2.48°     1.035<0°     0.984<-7.397°    0.9868<-7.807°    0.98<-8.9°       0.991<-8.019°    0.958<-8.358°    0.9673<-7.1°      0.943<-8.252°
            15             1.02<-5.126°     1.012<-2.484°    1.035<0°     0.984<-7.401°    0.9868<-7.812°    0.98<-8.908°     0.991<-8.023°    0.958<-8.361°    0.9673<-7.102°    0.943<-8.254°
            16             1.02<-5.122°     1.012<-2.481°    1.035<0°     0.984<-7.398°    0.9868<-7.809°    0.98<-8.903°     0.991<-8.02°     0.958<-8.359°    0.9673<-7.101°    0.943<-8.252°
            17             1.02<-5.124°     1.012<-2.483°    1.035<0°     0.984<-7.4°      0.9868<-7.811°    0.98<-8.907°     0.991<-8.022°    0.958<-8.36°     0.9673<-7.102°    0.943<-8.253°
            18             1.02<-5.122°     1.012<-2.482°    1.035<0°     0.984<-7.399°    0.9868<-7.809°    0.98<-8.904°     0.991<-8.021°    0.958<-8.359°    0.9673<-7.101°    0.943<-8.253°
            19             1.02<-5.124°     1.012<-2.483°    1.035<0°     0.984<-7.4°      0.9868<-7.81°     0.98<-8.906°     0.991<-8.022°    0.958<-8.36°     0.9673<-7.101°    0.943<-8.253°
            20             1.02<-5.123°     1.012<-2.482°    1.035<0°     0.984<-7.399°    0.9868<-7.809°    0.98<-8.904°     0.991<-8.021°    0.958<-8.359°    0.9673<-7.101°    0.943<-8.253°
            21             1.02<-5.124°     1.012<-2.483°    1.035<0°     0.984<-7.4°      0.9868<-7.81°     0.98<-8.905°     0.991<-8.021°    0.958<-8.36°     0.9673<-7.101°    0.943<-8.253°
            22             1.02<-5.123°     1.012<-2.482°    1.035<0°     0.984<-7.399°    0.9868<-7.81°     0.98<-8.905°     0.991<-8.021°    0.958<-8.359°    0.9673<-7.101°    0.943<-8.253°
            23             1.02<-5.123°     1.012<-2.483°    1.035<0°     0.984<-7.399°    0.9868<-7.81°     0.98<-8.905°     0.991<-8.021°    0.958<-8.36°     0.9673<-7.101°    0.943<-8.253°
            24             1.02<-5.123°     1.012<-2.482°    1.035<0°     0.984<-7.399°    0.9868<-7.81°     0.98<-8.905°     0.991<-8.021°    0.958<-8.36°     0.9673<-7.101°    0.943<-8.253°
            25             1.02<-5.123°     1.012<-2.482°    1.035<0°     0.984<-7.399°    0.9868<-7.81°     0.98<-8.905°     0.991<-8.021°    0.958<-8.36°     0.9673<-7.101°    0.943<-8.253°
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    Number_of_Iteration       V77              V78              V79              V80              V81              V82               V83               V84               V85
    ___________________    _____________    _____________    _____________    _____________    _____________    ______________    ______________    ______________    ____________

             1             1.006<0°         1<0°             1<0°             1.04<0°          1<0°             1<0°              1<0°              1<0°              0.985<0°
             2             1.006<-3.053°    1.004<-3.349°    1.01<-3.065°     1.04<-0.8837°    1.029<-1.904°    0.9902<-2.237°    0.9864<-0.9566°   0.9812<1.702°     0.985<3.281°
             3             1.006<-3.492°    1.003<-3.801°    1.009<-3.516°    1.04<-1.314°     1.028<-2.197°    0.9879<-3.035°    0.9837<-1.86°     0.9794<0.6523°    0.985<2.193°
             4             1.006<-3.272°    1.003<-3.579°    1.009<-3.284°    1.04<-1.044°     1.028<-1.969°    0.9888<-2.748°    0.9846<-1.552°    0.9798<0.9896°    0.985<2.549°
             5             1.006<-3.363°    1.003<-3.67°     1.009<-3.38°     1.04<-1.159°     1.028<-2.083°    0.9885<-2.857°    0.9843<-1.667°    0.9797<0.866°     0.985<2.419°
             6             1.006<-3.308°    1.003<-3.615°    1.009<-3.322°    1.04<-1.091°     1.028<-2.009°    0.9886<-2.794°    0.9844<-1.602°    0.9797<0.9348°    0.985<2.491°
             7             1.006<-3.345°    1.003<-3.653°    1.009<-3.361°    1.04<-1.137°     1.028<-2.06°     0.9885<-2.836°    0.9843<-1.645°    0.9797<0.8896°    0.985<2.444°
             8             1.006<-3.319°    1.003<-3.626°    1.009<-3.333°    1.04<-1.105°     1.028<-2.024°    0.9886<-2.807°    0.9844<-1.615°    0.9797<0.921°     0.985<2.476°
             9             1.006<-3.337°    1.003<-3.645°    1.009<-3.353°    1.04<-1.128°     1.028<-2.049°    0.9885<-2.828°    0.9844<-1.636°    0.9797<0.8989°    0.985<2.453°
            10             1.006<-3.325°    1.003<-3.632°    1.009<-3.339°    1.04<-1.111°     1.028<-2.032°    0.9886<-2.813°    0.9844<-1.621°    0.9797<0.9145°    0.985<2.47°
            11             1.006<-3.334°    1.003<-3.641°    1.009<-3.349°    1.04<-1.123°     1.028<-2.044°    0.9885<-2.824°    0.9844<-1.632°    0.9797<0.9034°    0.985<2.458°
            12             1.006<-3.327°    1.003<-3.635°    1.009<-3.342°    1.04<-1.115°     1.028<-2.035°    0.9885<-2.816°    0.9844<-1.624°    0.9797<0.9113°    0.985<2.466°
            13             1.006<-3.332°    1.003<-3.639°    1.009<-3.347°    1.04<-1.121°     1.028<-2.042°    0.9885<-2.821°    0.9844<-1.63°     0.9797<0.9057°    0.985<2.461°
            14             1.006<-3.329°    1.003<-3.636°    1.009<-3.343°    1.04<-1.116°     1.028<-2.037°    0.9885<-2.818°    0.9844<-1.626°    0.9797<0.9097°    0.985<2.465°
            15             1.006<-3.331°    1.003<-3.638°    1.009<-3.346°    1.04<-1.119°     1.028<-2.04°     0.9885<-2.82°     0.9844<-1.629°    0.9797<0.9069°    0.985<2.462°
            16             1.006<-3.329°    1.003<-3.637°    1.009<-3.344°    1.04<-1.117°     1.028<-2.038°    0.9885<-2.818°    0.9844<-1.627°    0.9797<0.9088°    0.985<2.464°
            17             1.006<-3.33°     1.003<-3.638°    1.009<-3.345°    1.04<-1.119°     1.028<-2.04°     0.9885<-2.82°     0.9844<-1.628°    0.9797<0.9074°    0.985<2.462°
            18             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.038°    0.9885<-2.819°    0.9844<-1.627°    0.9797<0.9084°    0.985<2.463°
            19             1.006<-3.33°     1.003<-3.638°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.628°    0.9797<0.9077°    0.985<2.463°
            20             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.627°    0.9797<0.9082°    0.985<2.463°
            21             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.628°    0.9797<0.9079°    0.985<2.463°
            22             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.627°    0.9797<0.9081°    0.985<2.463°
            23             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.628°    0.9797<0.9079°    0.985<2.463°
            24             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.627°    0.9797<0.9081°    0.985<2.463°
            25             1.006<-3.33°     1.003<-3.637°    1.009<-3.345°    1.04<-1.118°     1.028<-2.039°    0.9885<-2.819°    0.9844<-1.628°    0.9797<0.908°     0.985<2.463°
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    Number_of_Iteration       V86               V87              V88               V89              V90              V91             V92              V93               V94               V95
    ___________________    ______________    _____________    ______________    _____________    _____________    ____________    ____________    ______________    ______________    ______________

             1             1<0°              1.015<0°         1<0°              1.005<0°         0.985<0°         0.98<0°         0.99<0°         1<0°              1<0°              1<0°
             2             0.987<1.98°       1.015<2.268°     0.9897<6.512°     1.005<10.63°     0.985<4.102°     0.98<4.082°     0.99<4.64°      0.9876<1.558°     0.9917<-0.6772°   0.9824<-1.702°
             3             0.9864<0.819°     1.015<1.044°     0.987<5.316°      1.005<9.356°     0.985<2.931°     0.98<2.957°     0.99<3.49°      0.985<0.4736°     0.9893<-1.68°     0.9796<-2.627°
             4             0.9868<1.181°     1.015<1.451°     0.9876<5.685°     1.005<9.748°     0.985<3.342°     0.98<3.35°      0.99<3.879°     0.9856<0.842°     0.99<-1.328°      0.9806<-2.309°
             5             0.9867<1.049°     1.015<1.305°     0.9874<5.553°     1.005<9.608°     0.985<3.196°     0.98<3.21°      0.99<3.74°      0.9854<0.7096°    0.9898<-1.457°    0.9802<-2.427°
             6             0.9867<1.121°     1.015<1.383°     0.9875<5.625°     1.005<9.684°     0.985<3.274°     0.98<3.286°     0.99<3.816°     0.9855<0.7827°    0.9899<-1.385°    0.9804<-2.36°
             7             0.9867<1.074°     1.015<1.332°     0.9874<5.578°     1.005<9.634°     0.985<3.224°     0.98<3.236°     0.99<3.766°     0.9854<0.7347°    0.9898<-1.432°    0.9803<-2.405°
             8             0.9867<1.107°     1.015<1.367°     0.9875<5.611°     1.005<9.669°     0.985<3.259°     0.98<3.271°     0.99<3.801°     0.9854<0.768°     0.9898<-1.399°    0.9803<-2.373°
             9             0.9867<1.084°     1.015<1.342°     0.9874<5.587°     1.005<9.645°     0.985<3.234°     0.98<3.247°     0.99<3.777°     0.9854<0.7445°    0.9898<-1.423°    0.9803<-2.396°
            10             0.9867<1.1°       1.015<1.36°      0.9875<5.604°     1.005<9.662°     0.985<3.252°     0.98<3.264°     0.99<3.794°     0.9854<0.7611°    0.9898<-1.406°    0.9803<-2.38°
            11             0.9867<1.089°     1.015<1.348°     0.9874<5.592°     1.005<9.649°     0.985<3.239°     0.98<3.252°     0.99<3.781°     0.9854<0.7494°    0.9898<-1.418°    0.9803<-2.391°
            12             0.9867<1.097°     1.015<1.356°     0.9875<5.6°       1.005<9.658°     0.985<3.248°     0.98<3.26°      0.99<3.79°      0.9854<0.7577°    0.9898<-1.41°     0.9803<-2.383°
            13             0.9867<1.091°     1.015<1.35°      0.9875<5.595°     1.005<9.652°     0.985<3.242°     0.98<3.254°     0.99<3.784°     0.9854<0.7518°    0.9898<-1.416°    0.9803<-2.389°
            14             0.9867<1.095°     1.015<1.355°     0.9875<5.599°     1.005<9.656°     0.985<3.246°     0.98<3.258°     0.99<3.788°     0.9854<0.756°     0.9898<-1.411°    0.9803<-2.385°
            15             0.9867<1.092°     1.015<1.351°     0.9875<5.596°     1.005<9.653°     0.985<3.243°     0.98<3.255°     0.99<3.785°     0.9854<0.753°     0.9898<-1.414°    0.9803<-2.388°
            16             0.9867<1.094°     1.015<1.354°     0.9875<5.598°     1.005<9.655°     0.985<3.245°     0.98<3.257°     0.99<3.787°     0.9854<0.7551°    0.9898<-1.412°    0.9803<-2.386°
            17             0.9867<1.093°     1.015<1.352°     0.9875<5.596°     1.005<9.654°     0.985<3.244°     0.98<3.256°     0.99<3.786°     0.9854<0.7536°    0.9898<-1.414°    0.9803<-2.387°
            18             0.9867<1.094°     1.015<1.353°     0.9875<5.597°     1.005<9.655°     0.985<3.245°     0.98<3.257°     0.99<3.787°     0.9854<0.7547°    0.9898<-1.413°    0.9803<-2.386°
            19             0.9867<1.093°     1.015<1.352°     0.9875<5.597°     1.005<9.654°     0.985<3.244°     0.98<3.256°     0.99<3.786°     0.9854<0.7539°    0.9898<-1.413°    0.9803<-2.387°
            20             0.9867<1.094°     1.015<1.353°     0.9875<5.597°     1.005<9.655°     0.985<3.245°     0.98<3.257°     0.99<3.787°     0.9854<0.7545°    0.9898<-1.413°    0.9803<-2.386°
            21             0.9867<1.093°     1.015<1.353°     0.9875<5.597°     1.005<9.654°     0.985<3.244°     0.98<3.256°     0.99<3.786°     0.9854<0.7541°    0.9898<-1.413°    0.9803<-2.387°
            22             0.9867<1.094°     1.015<1.353°     0.9875<5.597°     1.005<9.655°     0.985<3.245°     0.98<3.257°     0.99<3.787°     0.9854<0.7544°    0.9898<-1.413°    0.9803<-2.386°
            23             0.9867<1.093°     1.015<1.353°     0.9875<5.597°     1.005<9.654°     0.985<3.244°     0.98<3.256°     0.99<3.786°     0.9854<0.7542°    0.9898<-1.413°    0.9803<-2.386°
            24             0.9867<1.094°     1.015<1.353°     0.9875<5.597°     1.005<9.655°     0.985<3.244°     0.98<3.257°     0.99<3.787°     0.9854<0.7543°    0.9898<-1.413°    0.9803<-2.386°
            25             0.9867<1.093°     1.015<1.353°     0.9875<5.597°     1.005<9.654°     0.985<3.244°     0.98<3.256°     0.99<3.786°     0.9854<0.7542°    0.9898<-1.413°    0.9803<-2.386°
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    Number_of_Iteration       V96               V97              V98              V99              V100             V101               V102             V103             V104             V105
    ___________________    ______________    _____________    _____________    _____________    _____________    _______________    _____________    _____________    _____________    _____________

             1             1<0°              1<0°             1<0°             1.01<0°          1.017<0°         1<0°               1<0°             1.001<0°         0.971<0°         0.965<0°
             2             0.9938<-1.967°    1.012<-1.763°    1.024<-2.238°    1.01<-2.403°     1.017<-1.271°    0.9928<0.4083°     0.9903<3.149°    1.001<-4.733°    0.971<-7.241°    0.965<-8.24°
             3             0.9917<-2.784°    1.011<-2.402°    1.023<-2.909°    1.01<-3.307°     1.017<-2.349°    0.9911<-0.7412°    0.989<1.974°     1.001<-5.969°    0.971<-8.686°    0.965<-9.794°
             4             0.9925<-2.479°    1.011<-2.113°    1.024<-2.587°    1.01<-2.941°     1.017<-1.934°    0.9915<-0.3553°    0.9892<2.363°    1.001<-5.53°     0.971<-8.276°    0.965<-9.383°
             5             0.9922<-2.594°    1.011<-2.227°    1.023<-2.714°    1.01<-3.078°     1.017<-2.085°    0.9914<-0.4939°    0.9891<2.224°    1.001<-5.688°    0.971<-8.424°    0.965<-9.532°
             6             0.9923<-2.528°    1.011<-2.16°     1.024<-2.641°    1.01<-3.002°     1.017<-2.004°    0.9914<-0.418°     0.9891<2.3°      1.001<-5.604°    0.971<-8.344°    0.965<-9.451°
             7             0.9922<-2.572°    1.011<-2.205°    1.023<-2.689°    1.01<-3.052°     1.017<-2.057°    0.9914<-0.4678°    0.9891<2.251°    1.001<-5.658°    0.971<-8.396°    0.965<-9.504°
             8             0.9923<-2.541°    1.011<-2.174°    1.024<-2.656°    1.01<-3.017°     1.017<-2.02°     0.9914<-0.4332°    0.9891<2.285°    1.001<-5.62°     0.971<-8.36°     0.965<-9.467°
             9             0.9923<-2.563°    1.011<-2.196°    1.024<-2.68°     1.01<-3.042°     1.017<-2.046°    0.9914<-0.4576°    0.9891<2.261°    1.001<-5.647°    0.971<-8.386°    0.965<-9.493°
            10             0.9923<-2.548°    1.011<-2.18°     1.024<-2.663°    1.01<-3.024°     1.017<-2.028°    0.9914<-0.4403°    0.9891<2.278°    1.001<-5.628°    0.971<-8.367°    0.965<-9.475°
            11             0.9923<-2.559°    1.011<-2.191°    1.024<-2.675°    1.01<-3.037°     1.017<-2.041°    0.9914<-0.4525°    0.9891<2.266°    1.001<-5.642°    0.971<-8.38°     0.965<-9.488°
            12             0.9923<-2.551°    1.011<-2.183°    1.024<-2.666°    1.01<-3.028°     1.017<-2.032°    0.9914<-0.4439°    0.9891<2.274°    1.001<-5.632°    0.971<-8.371°    0.965<-9.479°
            13             0.9923<-2.556°    1.011<-2.189°    1.024<-2.672°    1.01<-3.034°     1.017<-2.038°    0.9914<-0.45°      0.9891<2.268°    1.001<-5.639°    0.971<-8.378°    0.965<-9.485°
            14             0.9923<-2.552°    1.011<-2.185°    1.024<-2.668°    1.01<-3.03°      1.017<-2.034°    0.9914<-0.4457°    0.9891<2.272°    1.001<-5.634°    0.971<-8.373°    0.965<-9.481°
            15             0.9923<-2.555°    1.011<-2.188°    1.024<-2.671°    1.01<-3.033°     1.017<-2.037°    0.9914<-0.4487°    0.9891<2.269°    1.001<-5.638°    0.971<-8.376°    0.965<-9.484°
            16             0.9923<-2.553°    1.011<-2.186°    1.024<-2.669°    1.01<-3.031°     1.017<-2.035°    0.9914<-0.4466°    0.9891<2.272°    1.001<-5.635°    0.971<-8.374°    0.965<-9.482°
            17             0.9923<-2.555°    1.011<-2.187°    1.024<-2.67°     1.01<-3.032°     1.017<-2.036°    0.9914<-0.4481°    0.9891<2.27°     1.001<-5.637°    0.971<-8.376°    0.965<-9.483°
            18             0.9923<-2.554°    1.011<-2.186°    1.024<-2.669°    1.01<-3.031°     1.017<-2.035°    0.9914<-0.447°     0.9891<2.271°    1.001<-5.636°    0.971<-8.374°    0.965<-9.482°
            19             0.9923<-2.554°    1.011<-2.187°    1.024<-2.67°     1.01<-3.032°     1.017<-2.036°    0.9914<-0.4478°    0.9891<2.27°     1.001<-5.637°    0.971<-8.375°    0.965<-9.483°
            20             0.9923<-2.554°    1.011<-2.186°    1.024<-2.67°     1.01<-3.031°     1.017<-2.035°    0.9914<-0.4472°    0.9891<2.271°    1.001<-5.636°    0.971<-8.375°    0.965<-9.482°
            21             0.9923<-2.554°    1.011<-2.187°    1.024<-2.67°     1.01<-3.032°     1.017<-2.036°    0.9914<-0.4476°    0.9891<2.271°    1.001<-5.636°    0.971<-8.375°    0.965<-9.483°
            22             0.9923<-2.554°    1.011<-2.186°    1.024<-2.67°     1.01<-3.031°     1.017<-2.035°    0.9914<-0.4473°    0.9891<2.271°    1.001<-5.636°    0.971<-8.375°    0.965<-9.482°
            23             0.9923<-2.554°    1.011<-2.187°    1.024<-2.67°     1.01<-3.032°     1.017<-2.036°    0.9914<-0.4475°    0.9891<2.271°    1.001<-5.636°    0.971<-8.375°    0.965<-9.483°
            24             0.9923<-2.554°    1.011<-2.187°    1.024<-2.67°     1.01<-3.032°     1.017<-2.035°    0.9914<-0.4474°    0.9891<2.271°    1.001<-5.636°    0.971<-8.375°    0.965<-9.483°
            25             0.9923<-2.554°    1.011<-2.187°    1.024<-2.67°     1.01<-3.032°     1.017<-2.036°    0.9914<-0.4475°    0.9891<2.271°    1.001<-5.636°    0.971<-8.375°    0.965<-9.483°
```

```
    Number_of_Iteration       V106              V107             V108              V109             V110             V111             V112             V113             V114              V115
    ___________________    ______________    _____________    ______________    ______________    _____________    ____________    _____________    _____________    ______________    ______________

             1             1<0°              0.952<0°         1<0°              1<0°              0.973<0°         0.98<0°         0.975<0°         0.993<0°         1<0°              1<0°
             2             0.9642<-8.788°    0.952<-11.07°    0.9675<-9.701°    0.9683<-10.13°    0.973<-10.65°    0.98<-9.077°    0.975<-13.74°    0.993<-15.88°    0.9617<-15.21°    0.9616<-15.22°
             3             0.9608<-10.05°    0.952<-12.85°    0.966<-11.01°     0.9668<-11.46°    0.973<-12.33°    0.98<-10.68°    0.975<-15.47°    0.993<-16.39°    0.9598<-15.68°    0.9598<-15.69°
             4             0.9612<-9.641°    0.952<-12.44°    0.9662<-10.58°    0.967<-11.03°     0.973<-11.87°    0.98<-10.23°    0.975<-14.96°    0.993<-15.69°    0.9602<-15°       0.9601<-15.01°
             5             0.9611<-9.785°    0.952<-12.59°    0.9662<-10.73°    0.967<-11.19°     0.973<-12.03°    0.98<-10.39°    0.975<-15.14°    0.993<-16.22°    0.96<-15.48°      0.9599<-15.49°
             6             0.9612<-9.706°    0.952<-12.51°    0.9662<-10.65°    0.967<-11.1°      0.973<-11.95°    0.98<-10.3°     0.975<-15.05°    0.993<-15.85°    0.9602<-15.14°    0.9601<-15.14°
             7             0.9611<-9.758°    0.952<-12.56°    0.9662<-10.7°     0.967<-11.16°     0.973<-12°       0.98<-10.36°    0.975<-15.1°     0.993<-16.11°    0.9601<-15.38°    0.96<-15.39°
             8             0.9611<-9.722°    0.952<-12.53°    0.9662<-10.67°    0.967<-11.12°     0.973<-11.97°    0.98<-10.32°    0.975<-15.06°    0.993<-15.92°    0.9601<-15.21°    0.9601<-15.21°
             9             0.9611<-9.748°    0.952<-12.55°    0.9662<-10.69°    0.967<-11.15°     0.973<-11.99°    0.98<-10.35°    0.975<-15.09°    0.993<-16.06°    0.9601<-15.33°    0.96<-15.34°
            10             0.9611<-9.73°     0.952<-12.53°    0.9662<-10.67°    0.967<-11.13°     0.973<-11.97°    0.98<-10.33°    0.975<-15.07°    0.993<-15.96°    0.9601<-15.24°    0.96<-15.25°
            11             0.9611<-9.742°    0.952<-12.55°    0.9662<-10.69°    0.967<-11.14°     0.973<-11.99°    0.98<-10.34°    0.975<-15.09°    0.993<-16.03°    0.9601<-15.3°     0.96<-15.31°
            12             0.9611<-9.733°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.33°    0.975<-15.08°    0.993<-15.98°    0.9601<-15.26°    0.96<-15.27°
            13             0.9611<-9.74°     0.952<-12.54°    0.9662<-10.69°    0.967<-11.14°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16.01°    0.9601<-15.29°    0.96<-15.3°
            14             0.9611<-9.735°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.33°    0.975<-15.08°    0.993<-15.99°    0.9601<-15.27°    0.96<-15.28°
            15             0.9611<-9.738°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.14°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16.01°    0.9601<-15.28°    0.96<-15.29°
            16             0.9611<-9.736°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.27°    0.96<-15.28°
            17             0.9611<-9.738°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.14°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
            18             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.28°
            19             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.14°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
            20             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.28°
            21             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
            22             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
            23             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
            24             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
            25             0.9611<-9.737°    0.952<-12.54°    0.9662<-10.68°    0.967<-11.13°     0.973<-11.98°    0.98<-10.34°    0.975<-15.08°    0.993<-16°       0.9601<-15.28°    0.96<-15.29°
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    Number_of_Iteration       V116             V117              V118
    ___________________    _____________    ______________    _____________

             1             1.005<0°         1<0°              1<0°
             2             1.005<-2.831°    0.9749<-18.94°    0.9526<-7.83°
             3             1.005<-3.005°    0.9735<-19.42°    0.9494<-8.205°
             4             1.005<-2.805°    0.9742<-18.66°    0.9495<-8.056°
             5             1.005<-2.914°    0.9735<-19.24°    0.9494<-8.126°
             6             1.005<-2.84°     0.974<-18.83°     0.9494<-8.08°
             7             1.005<-2.892°    0.9737<-19.12°    0.9494<-8.112°
             8             1.005<-2.855°    0.9739<-18.91°    0.9494<-8.09°
             9             1.005<-2.881°    0.9738<-19.06°    0.9494<-8.106°
            10             1.005<-2.863°    0.9739<-18.95°    0.9494<-8.094°
            11             1.005<-2.876°    0.9738<-19.03°    0.9494<-8.102°
            12             1.005<-2.867°    0.9738<-18.97°    0.9494<-8.097°
            13             1.005<-2.873°    0.9738<-19.01°    0.9494<-8.101°
            14             1.005<-2.868°    0.9738<-18.98°    0.9494<-8.098°
            15             1.005<-2.872°    0.9738<-19°       0.9494<-8.1°
            16             1.005<-2.869°    0.9738<-18.99°    0.9494<-8.098°
            17             1.005<-2.871°    0.9738<-19°       0.9494<-8.099°
            18             1.005<-2.87°     0.9738<-18.99°    0.9494<-8.099°
            19             1.005<-2.871°    0.9738<-19°       0.9494<-8.099°
            20             1.005<-2.87°     0.9738<-18.99°    0.9494<-8.099°
            21             1.005<-2.871°    0.9738<-19°       0.9494<-8.099°
            22             1.005<-2.87°     0.9738<-19°       0.9494<-8.099°
            23             1.005<-2.87°     0.9738<-19°       0.9494<-8.099°
            24             1.005<-2.87°     0.9738<-19°       0.9494<-8.099°
            25             ...
    95     96     0.0171     0.0547     0.00737      0.2145      -88.694    6.2721e-05
    96     97     0.0173     0.0885       0.012     0.22125      -62.523    6.6217e-05
    98    100     0.0397      0.179      0.0238    0.071094       40.111    0.00011205
    99    100      0.018     0.0813      0.0108     0.22768      -11.717    7.3767e-05
   100    101     0.0277     0.1262      0.0164     0.29257       53.721    0.00022448
    92    102     0.0123     0.0559     0.00732     0.45763      -166.46    6.9236e-05
   101    102     0.0246      0.112      0.0147     0.41014       16.088     0.0002482
   100    103      0.016     0.0525      0.0268      1.1913       178.96    0.00030498
   100    104     0.0451      0.204     0.02705     0.57022       164.58     0.0011598
   103    104     0.0466     0.1584     0.02035     0.33832       156.92    0.00073468
   103    105     0.0535     0.1625      0.0204     0.43927       162.06     0.0012573
   100    106     0.0605      0.229       0.031     0.60824       166.15     0.0022263
   104    105    0.00994     0.0378     0.00493     0.50279       168.03    4.9677e-05
   105    106      0.014     0.0547     0.00717      0.1021       142.66    2.0011e-05
   105    107      0.053      0.183      0.0236     0.27703       170.89    0.00077817
   105    108     0.0261     0.0703     0.00922     0.27012      -166.28    0.00018401
   106    107      0.053      0.183      0.0236     0.25029       173.97    0.00070307
   108    109     0.0105     0.0288      0.0038     0.25043      -164.79     2.761e-05
   103    110    0.03906     0.1813     0.02305     0.60805          169     0.0009277
   109    110     0.0278     0.0762      0.0101     0.19142      -148.89    0.00014794
   110    111      0.022     0.0755        0.01     0.36746      -8.9305    0.00017785
   110    112     0.0247      0.064       0.031     0.76845      -170.25    0.00046883
    17    113    0.00913     0.0301     0.00384    0.078109      -121.96    6.5109e-06
    32    113     0.0615      0.203      0.0259     0.16505      -119.65    0.00062427
    32    114     0.0135     0.0612     0.00814     0.10095       149.98    1.8398e-05
    27    115     0.0164     0.0741     0.00986     0.22269       149.47    5.9895e-05
   114    115     0.0023     0.0104     0.00138    0.014745       150.64    7.8001e-08
    68    116    0.00034    0.00405       0.082      2.4651       135.09    2.8497e-07
    12    117     0.0329       0.14      0.0179     0.21533       143.51    0.00023308
    75    118     0.0145     0.0481     0.00599     0.48704       142.19     0.0001024
    76    118     0.0164     0.0544     0.00678     0.12172      -59.814    3.2739e-05

--------------------------------------------Bus Data Updated ------------------------------------------


  Bus Type    Injected Active Power    Injected Reactive Power    Bus Voltage Mag    Bus Voltage Angle    Bus Current Mag    Bus Current Angle
  ________    _____________________    _______________________    _______________    _________________    _______________    _________________

     3                  -0.51                   -0.28512                0.955            -18.969             0.61182             131.82
     2                   -0.2                      -0.09              0.97139             -18.43             0.22578             137.34
     2                  -0.39                       -0.1              0.96699            -18.071             0.41636             147.55
     3                  -0.39                    0.10033                0.998            -14.345             0.40351            -179.92
     2            -2.3615e-11                 1.3934e-11              0.99909             -13.86          2.7445e-11            -163.32
     3                  -0.52                 -0.0068134                 0.99            -16.642              0.5253             162.61
     2                  -0.19                      -0.02              0.98933             -17.09             0.19311              156.9
     3                  -0.28                   -0.32465                1.015            -8.7347             0.42238             122.04
     2             9.2746e-11                 3.8429e-11               1.0429            -1.4806          9.6261e-11            -23.987
     3                    4.5                   -0.51042                 1.05             6.1003              4.3132             12.572
     2                   -0.7                      -0.23              0.98456            -16.926             0.74837             144.89
     3                   0.38                     0.8598                 0.99            -17.455             0.94953            -83.611
     2                  -0.34                      -0.16              0.96788            -18.317             0.38823             136.48
     2                  -0.14                      -0.01              0.98359            -18.185              0.1427             157.73
     3                   -0.9                   -0.11729                 0.97            -18.518             0.93568             154.06
     2                  -0.25                       -0.1              0.98256            -17.752             0.27404             140.45
     2                  -0.11                      -0.03              0.99094            -15.923             0.11506             148.82
     3                   -0.6                   0.025167                0.973            -18.209             0.61719             164.19
     3                  -0.45                   -0.39286                0.962            -18.679             0.62096              120.2
     2                  -0.18                      -0.03              0.95694            -17.806             0.19069             152.73
     2                  -0.14                      -0.08              0.95774            -16.222             0.16836             134.03
     2                   -0.1                      -0.05              0.96904            -13.672             0.11538             139.76
     2                  -0.07                      -0.03              0.99948            -8.7599            0.076198             148.04
     3                  -0.13                   -0.14912                0.992            -8.8964             0.19943             122.18
     3                    2.2                     1.6634                 1.05             -1.832              2.6267            -38.924
     3                   3.14                    -1.3037                1.015           0.019476              3.3496             22.567
     3                  -0.71                  -0.090318                0.968              -14.4             0.73938             158.35
     2                  -0.17                      -0.07              0.96157            -16.125              0.1912              141.5
     2                  -0.24                      -0.04              0.96322            -17.116              0.2526             153.42
     2             5.1395e-11                 1.4473e-11               1.0085            -10.785          5.2943e-11            -26.512
     3                  -0.36                   0.081698                0.967            -16.999             0.38175             175.79
     3                  -0.59                   -0.39298                0.963            -14.943             0.73613             131.39
     2                  -0.23                      -0.09              0.96887            -19.115             0.25492             139.51
     3                  -0.59                  -0.011837                0.984            -18.495             0.59971             160.36
     2                  -0.33                      -0.09              0.97971            -18.938             0.34914             145.81
     3                  -0.31                   -0.02141                 0.98            -18.948             0.31708              157.1
     2            -4.9504e-12                  5.655e-12              0.98631             -17.97             7.62e-12            -149.17
     2             2.3067e-11                -3.9914e-11               1.0013            -12.672          4.6041e-11             47.303
     2                  -0.27                      -0.11              0.96834            -21.433             0.30108              136.4
     3                  -0.66                    0.10661                 0.97            -22.546             0.68923             166.63
     2                  -0.37                       -0.1              0.96683            -22.989             0.39642             141.89
     3                  -0.96                    0.18036                0.985            -21.387             0.99167             169.25
     2                  -0.18                      -0.07              0.97713            -18.554             0.19765              140.2
     2                  -0.16                      -0.08              0.98446            -16.082             0.18171             137.35
     2                  -0.53                      -0.22               0.9864            -14.257             0.58176              143.2
     3                  -0.09                   -0.15035                1.005            -11.455             0.17436             109.45
     2                  -0.34                -4.6071e-12                1.017            -9.2308              0.3343             170.77
     2                   -0.2                      -0.11               1.0206            -10.017             0.22364             141.17
     3                   1.17                    0.85926                1.025            -9.0144              1.4162            -45.309
     2                  -0.17                      -0.04               1.0011            -11.056             0.17445              155.7
     2                  -0.17                      -0.08              0.96687            -13.679             0.19432             141.12
     2                  -0.18                      -0.05              0.95681            -14.633             0.19525             149.84
     2                  -0.23                      -0.11              0.94598            -15.611             0.26951             138.83
     3                  -0.65                   -0.28084                0.955            -14.701             0.74144             141.93
     3                  -0.63                   -0.17336                0.952            -14.992             0.68636             149.62
     3                  -0.84                   -0.20284                0.954            -14.804             0.90581             151.62
     2                  -0.12                      -0.03              0.97058            -13.596             0.12744             152.37
     2                  -0.12                      -0.03              0.95903            -14.453             0.12898             151.51
     3                  -1.22                   0.062113                0.985            -10.612              1.2402              172.3
     2                  -0.78                      -0.03              0.99316            -6.8185             0.78596             170.98
     3                    1.6                   -0.38943                0.995            -5.9266               1.655             7.7529
     3                  -0.77                   -0.12732                0.998            -6.5418             0.78202             164.07
     2             1.9754e-12                -7.8228e-13              0.99256            -7.1884          2.1406e-12             14.416
     2              5.138e-12                -1.8301e-12              0.99833            -5.4524          5.4634e-12             14.153
     3                   3.91                    -2.5927                1.005            -2.3079              4.6682              31.24
     3                   3.53                      1.783                 1.05              -2.48              3.7664            -29.279
     2                  -0.28                      -0.07               1.0197            -5.1233             0.28305             160.84
     2             1.8237e-11                -1.2656e-11               1.0123            -2.4824          2.1928e-11             32.276
     1                  5.131                     0.8681                1.035                  0              5.0279            -9.6029
     3                  -0.66                   -0.10318                0.984            -7.3994             0.67888             163.71
     2             2.6682e-13                -1.7458e-12              0.98684            -7.8098          1.7897e-12             73.501
     3                  -0.12                   -0.11131                 0.98             -8.905             0.16701             128.25
     3                  -0.06                   0.096511                0.991            -8.0213             0.11467            -129.89
     3                  -0.68                   -0.32605                0.958            -8.3595             0.78719             146.02
     2                  -0.47                      -0.11              0.96732            -7.1011             0.49901             159.73
     3                  -0.68                   -0.30747                0.943             -8.253             0.79139             147.42
     3                  -0.61                   -0.15873                1.006            -3.3299             0.62656             162.08
     2                  -0.71                      -0.26               1.0034            -3.6373             0.75353             156.25
     2                  -0.39                      -0.32               1.0092            -3.3449             0.49987             137.29
     3                   3.47                     1.8724                 1.04            -1.1182              3.7913             -29.47
     2             5.1462e-12                -6.0712e-13                1.028             -2.039          5.0409e-12             4.6894
     2                  -0.54                      -0.27              0.98854            -2.8192             0.61074             150.62
     2                   -0.2                       -0.1              0.98438            -1.6275             0.22716             151.81
     2                  -0.11                      -0.07               0.9797            0.90802             0.13309             148.44
     3                  -0.24                   -0.20605                0.985             2.4629             0.32113             141.82
     2                  -0.21                       -0.1              0.98669             1.0935             0.23573             155.63
     3                   0.04                    0.11022                1.015             1.3527             0.11552              -68.7
     2                  -0.48                       -0.1              0.98745              5.597             0.49654             173.83
     3                   6.07                  -0.059067                1.005             9.6545              6.0401             10.212
     3                  -1.63                    0.17309                0.985             3.2444              1.6641            -170.69
     3                   -0.1                   -0.13088                 0.98             3.2565             0.16807             130.64
     3                  -0.65                    -0.2395                 0.99             3.7865             0.69972             163.56
     2                  -0.12                      -0.07              0.98543            0.75425             0.14098              150.5
     2                   -0.3                      -0.16              0.98983            -1.4131             0.34349             150.51
     2                  -0.42                      -0.31              0.98033            -2.3864             0.53249             141.18
     2                  -0.38                      -0.15              0.99228            -2.5541             0.41171              155.9
     2                  -0.15                      -0.09               1.0112            -2.1866               0.173             146.85
     2                  -0.34                      -0.08               1.0235            -2.6697             0.34126             164.09
     3                  -0.42                   -0.17537                 1.01            -3.0316             0.45064             154.31
     3                   2.15                     0.9475                1.017            -2.0355              2.3102            -25.819
     2                  -0.22                      -0.15              0.99142           -0.44746             0.26858             145.27
     2                  -0.05                      -0.03              0.98913             2.2707             0.05895             151.31
     3                   0.17                    0.25689                1.001            -5.6362             0.30774            -62.142
     3                  -0.38                   -0.16999                0.971            -8.3749             0.42872             147.52
     3                  -0.31                   -0.38886                0.965            -9.4826             0.51534             119.08
     2                  -0.43                      -0.16              0.96114            -9.7371             0.47735             149.85
     3                   -0.5                  -0.054369                0.952            -12.541             0.52831             161.25
     2                  -0.02                      -0.01              0.96621            -10.682            0.023143             142.75
     2                  -0.08                      -0.03              0.96703            -11.135            0.088353             148.31
     3                  -0.39                   -0.24743                0.973            -11.981             0.47468             135.63
     3                   0.36                  -0.018438                 0.98            -10.336             0.36783            -7.4043
     3                  -0.68                    0.28512                0.975            -15.081             0.75626            -172.33
     3                  -0.06                    0.20452                0.993                -16             0.21464            -122.35
     2                  -0.08                      -0.03              0.96009            -15.278            0.088991             144.17
     2                  -0.22                      -0.07              0.96002            -15.286             0.24048             147.06
     3                  -1.84                    -1.7418                1.005            -2.8703              2.5211              133.7
     2                   -0.2                      -0.08              0.97382            -18.996              0.2212              139.2
     2                  -0.33                      -0.15              0.94943            -8.0989              0.3818             147.46

----------------------------------------------------Contingency Report--------------------------------------------------
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N-1 contingency analysis evaluate the power flow and voltage profile for the network for lines and canles

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 N-1 Power flow convergence when one line is removed at a time

  Line Removed    Number_of_Iteration      Error            V1               V2                V3                V4                V5               V6               V7               V8
  ____________    ___________________    __________    ____________    ______________    ______________    ______________    ______________    ____________    ______________    ____________

  Line_1-2                62             7.7194e-11    0.955<-19.83°   0.9809<-18°       0.9669<-18.58°    0.998<-14.38°     0.9991<-13.9°     0.99<-16.62°    0.9893<-17.04°    1.015<-8.764°
  Line_1-3                69             7.5153e-11    0.955<-23.58°   0.9703<-20.39°    0.9855<-16.83°    0.998<-14.33°     1<-13.82°         0.99<-16.8°     0.9893<-17.33°    1.015<-8.736°
  Line_4-5                76             7.6956e-11    0.955<-19.56°   0.9714<-19.4°     0.9672<-18.5°     0.998<-20.66°     1<-13.42°         0.99<-17°       0.9894<-17.76°    1.015<-8.49°
  Line_3-5                77             9.2463e-11    0.955<-23.4°    0.9707<-20.82°    0.9549<-23.14°    0.998<-14.21°     1.001<-13.66°     0.99<-17.11°    0.9894<-17.83°    1.015<-8.66°
  Line_5-6                74             9.4128e-11    0.955<-19.82°   0.9715<-19.75°    0.9671<-18.72°    0.998<-14.02°     0.9999<-13.41°    0.99<-21.23°    0.9888<-20.55°    1.015<-8.486°
  Line_6-7                62             9.5665e-11    0.955<-19.25°   0.9714<-18.91°    0.967<-18.28°     0.998<-14.15°     0.9991<-13.61°    0.99<-15.21°    0.9878<-18.42°    1.015<-8.575°
  Line_8-9              1000             7.6746e+10    0.955<-56.67°   0.9713<-55.69°    0.9667<-55.95°    0.998<-53.1°      0.9984<-52.76°    0.99<-54.61°    0.9892<-54.69°    1.015<-49.32°
  Line_8-5              1000                    NaN    0.955<NaN°      NaN<NaN°          NaN<NaN°          0.998<NaN°        NaN<NaN°          0.99<NaN°       NaN<NaN°          1.015<NaN°
  Line_9-10             1000                    NaN    0.955<NaN°      NaN<NaN°          NaN<NaN°          0.998<NaN°        NaN<NaN°          0.99<NaN°       NaN<NaN°          1.015<NaN°
  Line_4-11               66             7.7095e-11    0.955<-19.27°   0.9714<-18.96°    0.9669<-18.27°    0.998<-13.68°     0.9988<-13.5°     0.99<-16.8°     0.9894<-17.44°    1.015<-8.501°
  Line_5-11               67             9.5921e-11    0.955<-19.33°   0.9714<-19.09°    0.9671<-18.31°    0.998<-14.06°     0.9998<-13.41°    0.99<-16.82°    0.9894<-17.52°    1.015<-8.447°
  Line_11-12              65             8.1657e-11    0.955<-19.44°   0.9714<-19.15°    0.9668<-18.43°    0.998<-14.05°     0.9983<-13.62°    0.99<-16.96°    0.9894<-17.62°    1.015<-8.57°
  Line_2-12               66              9.102e-11    0.955<-21.33°   0.94<-22.45°      0.9666<-19.49°    0.998<-14.51°     0.999<-14.05°     0.99<-16.65°    0.9893<-17.03°    1.015<-8.875°
  Line_3-12               61             9.4752e-11    0.955<-19.33°   0.9713<-18.52°    0.9619<-18.46°    0.998<-14.38°     0.9988<-13.9°     0.99<-16.63°    0.9893<-17.05°    1.015<-8.759°
  Line_7-12               61             8.4171e-11    0.955<-19.09°   0.9714<-18.64°    0.967<-18.16°     0.998<-14.24°     0.9991<-13.73°    0.99<-15.96°    0.9887<-16.18°    1.015<-8.65°
  Line_11-13              68             9.2367e-11    0.955<-18°      0.9714<-17.43°    0.967<-17.11°     0.998<-13.41°     0.9992<-12.96°    0.99<-15.69°    0.9893<-16.11°    1.015<-8.121°
  Line_12-14              64             7.9052e-11    0.955<-18.33°   0.9714<-17.74°    0.967<-17.45°     0.998<-13.83°     0.999<-13.36°     0.99<-16.03°    0.9893<-16.44°    1.015<-8.378°
  Line_13-15              63             9.4619e-11    0.955<-18.94°   0.9714<-18.4°     0.967<-18.04°     0.998<-14.32°     0.999<-13.83°     0.99<-16.62°    0.9893<-17.06°    1.015<-8.717°
  Line_14-15              63             8.7921e-11    0.955<-18.81°   0.9714<-18.26°    0.967<-17.91°     0.998<-14.21°     0.9991<-13.73°    0.99<-16.49°    0.9893<-16.92°    1.015<-8.642°
  Line_12-16              64             8.3264e-11    0.955<-18.69°   0.9714<-18.13°    0.967<-17.8°      0.998<-14.12°     0.9991<-13.64°    0.99<-16.37°    0.9893<-16.8°     1.015<-8.585°
  Line_15-17              72              8.701e-11    0.955<-19.47°   0.9714<-18.99°    0.967<-18.55°     0.998<-14.72°     0.9992<-14.21°    0.99<-17.11°    0.9893<-17.61°    1.015<-8.812°
  Line_16-17              65             9.1688e-11    0.955<-19.63°   0.9714<-19.14°    0.967<-18.71°     0.998<-14.87°     0.9991<-14.38°    0.99<-17.27°    0.9893<-17.76°    1.015<-9.093°
  Line_17-18              70              7.542e-11    0.955<-18.93°   0.9714<-18.4°     0.967<-18.02°     0.998<-14.28°     0.9991<-13.79°    0.99<-16.59°    0.9893<-17.05°    1.015<-8.6°
  Line_18-19              61             9.2299e-11    0.955<-18.92°   0.9714<-18.39°    0.967<-18.03°     0.998<-14.29°     0.9991<-13.81°    0.99<-16.6°     0.9893<-17.05°    1.015<-8.666°
  Line_19-20              66             9.6322e-11    0.955<-19.14°   0.9714<-18.61°    0.967<-18.24°     0.998<-14.51°     0.9991<-14.02°    0.99<-16.81°    0.9893<-17.26°    1.015<-8.878°
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  Line Removed            V9                  V10              V11               V12              V13               V14              V15             V16               V17
  Line_1-2      1.043<-1.51°              1.05<6.071°      0.9846<-16.88°    0.99<-17.36°     0.9679<-18.28°    0.9836<-18.11°   0.97<-18.5°     0.9826<-17.68°    0.9909<-15.91°
  Line_1-3      1.043<-1.482°             1.05<6.099°      0.9846<-17.15°    0.99<-17.83°     0.9679<-18.52°    0.9836<-18.5°    0.97<-18.65°    0.9825<-18.04°    0.9909<-16.04°
  Line_4-5      1.043<-1.236°             1.05<6.345°      0.9844<-18.7°     0.99<-18.64°     0.9679<-19.8°     0.9836<-19.19°   0.97<-19.01°    0.9825<-18.67°    0.991<-16.26°
  Line_3-5      1.043<-1.406°             1.05<6.175°      0.9845<-17.6°     0.99<-18.63°     0.9678<-18.93°    0.9836<-19.16°   0.97<-18.91°    0.9825<-18.66°    0.991<-16.24°
  Line_5-6      1.043<-1.231°             1.05<6.349°      0.9841<-17.79°    0.99<-19.06°     0.9676<-19.09°    0.9836<-19.49°   0.97<-19°       0.9824<-18.96°    0.991<-16.29°
  Line_6-7      1.043<-1.321°             1.05<6.26°       0.9844<-17.22°    0.99<-18.05°     0.9677<-18.57°    0.9836<-18.66°   0.97<-18.67°    0.9825<-18.19°    0.991<-16.03°
  Line_8-9      -5.037e+04<3.297e+16°     1.05<3.462e+16°  0.9847<-54.33°    0.99<-54.45°     0.9673<-54.12°    0.9827<-53.45°   0.97<-48.9°     0.9794<-52.7°     0.9874<-46.42°
  Line_8-5      NaN<NaN°                  1.05<NaN°        NaN<NaN°          0.99<NaN°        NaN<NaN°          NaN<NaN°         0.97<NaN°       NaN<NaN°          NaN<NaN°
  Line_9-10     NaN<NaN°                  1.05<NaN°        NaN<NaN°          0.99<NaN°        NaN<NaN°          NaN<NaN°         0.97<NaN°       NaN<NaN°          NaN<NaN°
  Line_4-11     1.043<-1.246°             1.05<6.334°      0.9815<-17.91°    0.99<-18.13°     0.9655<-19.14°    0.9836<-18.75°   0.97<-18.77°    0.9825<-18.26°    0.991<-16.08°
  Line_5-11     1.043<-1.193°             1.05<6.388°      0.9813<-18.16°    0.99<-18.29°     0.9654<-19.35°    0.9836<-18.88°   0.97<-18.83°    0.9825<-18.38°    0.991<-16.12°
  Line_11-12    1.043<-1.316°             1.05<6.265°      0.9758<-15.87°    0.99<-18.33°     0.9609<-17.54°    0.9836<-18.85°   0.97<-18.58°    0.9825<-18.37°    0.9909<-15.99°
  Line_2-12     1.043<-1.621°             1.05<5.96°       0.9846<-16.88°    0.99<-17.29°     0.9679<-18.28°    0.9836<-18.06°   0.97<-18.52°    0.9826<-17.64°    0.9909<-15.94°
  Line_3-12     1.043<-1.505°             1.05<6.076°      0.9845<-16.89°    0.99<-17.38°     0.9679<-18.29°    0.9836<-18.13°   0.97<-18.5°     0.9826<-17.7°     0.9909<-15.91°
  Line_7-12     1.043<-1.396°             1.05<6.185°      0.9845<-17.05°    0.99<-17.72°     0.9678<-18.43°    0.9836<-18.4°    0.97<-18.58°    0.9825<-17.95°    0.9909<-15.96°
  Line_11-13    1.043<-0.8666°            1.05<6.714°      0.9874<-15.71°    0.99<-16.44°     0.9021<-23.97°    0.9834<-17.61°   0.97<-19.18°    0.9827<-17.12°    0.991<-16.12°
  Line_12-14    1.043<-1.124°             1.05<6.457°      0.9846<-16.32°    0.99<-16.73°     0.9679<-17.92°    0.9636<-20.55°   0.97<-18.83°    0.9826<-17.28°    0.991<-15.98°
  Line_13-15    1.043<-1.463°             1.05<6.118°      0.9841<-16.88°    0.99<-17.43°     0.9645<-18.18°    0.9836<-18.17°   0.97<-18.54°    0.9826<-17.73°    0.9909<-15.93°
  Line_14-15    1.043<-1.388°             1.05<6.193°      0.9846<-16.77°    0.99<-17.27°     0.9679<-18.21°    0.9868<-17.85°   0.97<-18.59°    0.9826<-17.63°    0.9909<-15.93°
  Line_12-16    1.043<-1.331°             1.05<6.25°       0.9846<-16.65°    0.99<-17.14°     0.9679<-18.11°    0.9836<-17.95°   0.97<-18.53°    0.9625<-18.49°    0.9899<-15.99°
  Line_15-17    1.043<-1.558°             1.05<6.023°      0.9844<-17.54°    0.99<-18.05°     0.9673<-19.54°    0.9832<-19.49°   0.97<-21.82°    0.9837<-17.76°    0.9953<-14.67°
  Line_16-17    1.043<-1.838°             1.05<5.742°      0.9845<-17.56°    0.99<-18.2°      0.9679<-18.81°    0.9836<-18.74°   0.97<-18.54°    0.9767<-19.32°    0.9911<-15.78°
  Line_17-18    1.043<-1.346°             1.05<6.235°      0.9845<-16.91°    0.99<-17.43°     0.9678<-18.48°    0.9835<-18.36°   0.97<-19.26°    0.9838<-17.53°    0.9951<-15.27°
  Line_18-19    1.043<-1.412°             1.05<6.169°      0.9846<-16.89°    0.99<-17.42°     0.9679<-18.32°    0.9836<-18.2°    0.97<-18.67°    0.9826<-17.66°    0.991<-15.72°
  Line_19-20    1.043<-1.623°             1.05<5.957°      0.9846<-17.1°     0.99<-17.63°     0.9679<-18.52°    0.9836<-18.39°   0.97<-18.8°     0.9825<-17.93°    0.9909<-16.1°
```

```
  Line Removed        V18             V19             V20              V21              V22              V23
  Line_1-2      0.973<-18.19°   0.962<-18.66°   0.957<-17.79°    0.9578<-16.21°   0.969<-13.66°    0.9995<-8.754°
  Line_1-3      0.973<-18.33°   0.962<-18.8°    0.9569<-17.91°   0.9577<-16.32°   0.969<-13.76°    0.9995<-8.833°
  Line_4-5      0.973<-18.58°   0.962<-19.09°   0.9568<-18.16°   0.9575<-16.54°   0.9688<-13.94°   0.9994<-8.96°
  Line_3-5      0.973<-18.54°   0.962<-19.02°   0.9569<-18.11°   0.9576<-16.5°    0.9689<-13.92°   0.9994<-8.958°
  Line_5-6      0.973<-18.6°    0.962<-19.09°   0.9568<-18.16°   0.9576<-16.54°   0.9688<-13.95°   0.9994<-8.97°
  Line_6-7      0.973<-18.32°   0.962<-18.8°    0.9569<-17.91°   0.9577<-16.31°   0.969<-13.75°    0.9994<-8.809°
  Line_8-9      0.973<-48.19°   0.962<-48.09°   0.9528<-45.96°   0.9516<-43.44°   0.9623<-39.81°   0.9963<-33.21°
  Line_8-5      0.973<NaN°      0.962<NaN°      NaN<NaN°         NaN<NaN°         NaN<NaN°         NaN<NaN°
  Line_9-10     0.973<NaN°      0.962<NaN°      NaN<NaN°         NaN<NaN°         NaN<NaN°         NaN<NaN°
  Line_4-11     0.973<-18.39°   0.962<-18.88°   0.9569<-17.97°   0.9576<-16.37°   0.9689<-13.79°   0.9994<-8.838°
  Line_5-11     0.973<-18.43°   0.962<-18.93°   0.9569<-18.02°   0.9576<-16.4°    0.9689<-13.82°   0.9994<-8.858°
  Line_11-12    0.973<-18.27°   0.962<-18.74°   0.9569<-17.86°   0.9577<-16.27°   0.969<-13.71°    0.9995<-8.783°
  Line_2-12     0.973<-18.22°   0.962<-18.68°   0.957<-17.82°    0.9578<-16.24°   0.9691<-13.69°   0.9995<-8.785°
  Line_3-12     0.973<-18.2°    0.962<-18.66°   0.9569<-17.79°   0.9577<-16.21°   0.969<-13.66°    0.9995<-8.755°
  Line_7-12     0.973<-18.25°   0.962<-18.73°   0.9569<-17.85°   0.9577<-16.26°   0.969<-13.7°     0.9995<-8.777°
  Line_11-13    0.973<-18.54°   0.962<-19.15°   0.9567<-18.18°   0.9574<-16.52°   0.9687<-13.89°   0.9994<-8.858°
  Line_12-14    0.973<-18.34°   0.962<-18.89°   0.9568<-17.97°   0.9576<-16.35°   0.9689<-13.76°   0.9994<-8.78°
  Line_13-15    0.973<-18.22°   0.962<-18.69°   0.9569<-17.82°   0.9577<-16.23°   0.969<-13.68°    0.9995<-8.762°
  Line_14-15    0.973<-18.24°   0.962<-18.72°   0.9569<-17.84°   0.9577<-16.25°   0.969<-13.69°    0.9995<-8.76°
  Line_12-16    0.973<-18.27°   0.962<-18.71°   0.9569<-17.84°   0.9577<-16.25°   0.969<-13.7°     0.9995<-8.785°
  Line_15-17    0.973<-18.41°   0.962<-20.39°   0.9557<-19°      0.9559<-17.03°   0.9671<-14.05°   0.9991<-8.46°
  Line_16-17    0.973<-18.13°   0.962<-18.65°   0.9569<-17.78°   0.9577<-16.2°    0.969<-13.65°    0.9995<-8.734°
  Line_17-18    0.973<-23.1°    0.962<-21.03°   0.9554<-19.57°   0.9555<-17.54°   0.9667<-14.49°   0.999<-8.798°
  Line_18-19    0.973<-17.38°   0.962<-19.22°   0.9566<-18.2°    0.9572<-16.51°   0.9685<-13.84°   0.9994<-8.742°
  Line_19-20    0.973<-18.51°   0.962<-19.1°    0.9413<-14.9°    0.9467<-13.94°   0.9628<-12.09°   0.9...
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```
  Line Removed       V24            V25             V26                V27             V28              V29              V30             V31             V32             V33
  Line_1-2      0.992<-8.891°   1.05<-1.828°   1.015<0.02167°     0.968<-14.39°   0.9616<-16.12°   0.9632<-17.11°   1.009<-10.79°   0.967<-16.99°   0.963<-14.93°   0.9689<-19.1°
  Line_1-3      0.992<-8.959°   1.05<-1.905°   1.015<-0.0504°     0.968<-14.49°   0.9616<-16.21°   0.9632<-17.21°   1.008<-10.85°   0.967<-17.09°   0.963<-15.03°   0.9689<-19.22°
  Line_4-5      0.992<-9.067°   1.05<-2.012°   1.015<-0.1383°     0.968<-14.64°   0.9616<-16.38°   0.9632<-17.39°   1.008<-10.89°   0.967<-17.28°   0.963<-15.19°   0.9689<-19.46°
  Line_3-5      0.992<-9.065°   1.05<-2.023°   1.015<-0.1591°     0.968<-14.64°   0.9616<-16.37°   0.9632<-17.38°   1.008<-10.93°   0.967<-17.26°   0.963<-15.19°   0.9689<-19.41°
  Line_5-6      0.992<-9.076°   1.05<-2.023°   1.015<-0.1486°     0.968<-14.66°   0.9616<-16.4°    0.9632<-17.4°    1.008<-10.9°    0.967<-17.29°   0.963<-15.21°   0.9689<-19.46°
  Line_6-7      0.992<-8.939°   1.05<-1.87°    1.015<-0.007173°   0.968<-14.46°   0.9616<-16.19°   0.9632<-17.19°   1.008<-10.79°   0.967<-17.08°   0.963<-15.01°   0.9689<-19.21°
  Line_8-9      0.992<-29.84°   1.05<-28.96°   1.015<-28.23°      0.968<-41.95°   0.9615<-44.02°   0.9633<-45.41°   0.997<-41.8°    0.967<-45.44°   0.963<-42.41°   0.9648<-45.9°
  Line_8-5      0.992<NaN°      1.05<NaN°      1.015<NaN°         0.968<NaN°      NaN<NaN°         NaN<NaN°         NaN<NaN°        0.967<NaN°      0.963<NaN°      NaN<NaN°
  Line_9-10     0.992<NaN°      1.05<NaN°      1.015<NaN°         0.968<NaN°      NaN<NaN°         NaN<NaN°         NaN<NaN°        0.967<NaN°      0.963<NaN°      NaN<NaN°
  Line_4-11     0.992<-8.963°   1.05<-1.892°   1.015<-0.0242°     0.968<-14.5°    0.9616<-16.23°   0.9632<-17.23°   1.008<-10.79°   0.967<-17.12°   0.963<-15.05°   0.9689<-19.28°
  Line_5-11     0.992<-8.98°    1.05<-1.908°   1.015<-0.03634°    0.968<-14.52°   0.9616<-16.26°   0.9632<-17.26°   1.008<-10.79°   0.967<-17.15°   0.963<-15.07°   0.9689<-19.32°
  Line_11-12    0.992<-8.917°   1.05<-1.845°   1.015<0.01645°     0.968<-14.44°   0.9616<-16.17°   0.9632<-17.16°   1.008<-10.76°   0.967<-17.05°   0.963<-14.98°   0.9689<-19.15°
  Line_2-12     0.992<-8.918°   1.05<-1.867°   1.015<-0.02232°    0.968<-14.43°   0.9616<-16.15°   0.9632<-17.14°   1.009<-10.84°   0.967<-17.02°   0.963<-14.97°   0.9689<-19.13°
  Line_3-12     0.992<-8.892°   1.05<-1.829°   1.015<0.02086°     0.968<-14.39°   0.9616<-16.12°   0.9632<-17.11°   1.009<-10.79°   0.967<-16.99°   0.963<-14.94°   0.9689<-19.1°
  Line_7-12     0.992<-8.911°   1.05<-1.843°   1.015<0.01425°     0.968<-14.42°   0.9616<-16.15°   0.9632<-17.14°   1.008<-10.78°   0.967<-17.03°   0.963<-14.97°   0.9689<-19.15°
  Line_11-13    0.992<-8.981°   1.05<-1.876°   1.015<0.01475°     0.968<-14.51°   0.9616<-16.25°   0.9632<-17.26°   1.008<-10.7°    0.967<-17.14°   0.963<-15.07°   0.9689<-19.53°
  Line_12-14    0.992<-8.915°   1.05<-1.822°   1.015<0.05106°     0.968<-14.42°   0.9616<-16.15°   0.9632<-17.15°   1.008<-10.7°    0.967<-17.04°   0.963<-14.97°   0.9689<-19.3°
  Line_13-15    0.992<-8.898°   1.05<-1.833°   1.015<0.01986°     0.968<-14.4°    0.9616<-16.13°   0.9632<-17.12°   1.009<-10.78°   0.967<-17°      0.963<-14.95°   0.9689<-19.13°
  Line_14-15    0.992<-8.897°   1.05<-1.825°   1.015<0.03212°     0.968<-14.4°    0.9616<-16.13°   0.9632<-17.12°   1.008<-10.76°   0.967<-17°      0.963<-14.94°   0.9689<-19.16°
  Line_12-16    0.992<-8.917°   1.05<-1.846°   1.015<0.01639°     0.968<-14.44°   0.9616<-16.17°   0.9632<-17.17°   1.008<-10.76°   0.967<-17.06°   0.963<-14.99°   0.9689<-19.12°
  Line_15-17    0.992<-8.649°   1.05<-1.414°   1.015<0.4338°      0.968<-13.71°   0.9616<-15.35°   0.9632<-16.25°   1.011<-10.37°   0.967<-16.1°    0.963<-14.22°   0.9687<-21.12°
  Line_16-17    0.992<-8.874°   1.05<-1.825°   1.015<0.006281°    0.968<-14.34°   0.9616<-16.05°   0.9632<-17.03°   1.009<-10.84°   0.967<-16.91°   0.963<-14.88°   0.9689<-19.14°
  Line_17-18    0.992<-8.936°   1.05<-1.72°    1.015<0.167°       0.968<-14.13°   0.9616<-15.79°   0.9632<-16.72°   1.01<-10.54°    0.967<-16.58°   0.963<-14.65°   0.9689<-19.68°
  Line_18-19    0.992<-8.883°   1.05<-1.773°   1.015<0.09005°     0.968<-14.31°   0.9616<-16.02°   0.9632<-16.99°   1.009<-10.69°   0.967<-16.87°   0.963<-14.84°   0.9689<-19.22°
```

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  Line Removed       V34             V35              V36             V37              V38              V39              V40             V41              V42             V43
  Line_1-2      0.984<-18.49°   0.9797<-18.93°   0.98<-18.94°    0.9863<-17.96°   1.001<-12.67°    0.9683<-21.43°   0.97<-22.54°    0.9668<-22.99°   0.985<-21.38°   0.9771<-18.55°
  Line_1-3      0.984<-18.56°   0.9797<-19°      0.98<-19.01°    0.9863<-18.04°   1.001<-12.73°    0.9683<-21.49°   0.97<-22.6°     0.9668<-23.04°   0.985<-21.43°   0.9771<-18.61°
  Line_4-5      0.984<-18.68°   0.9797<-19.12°   0.98<-19.13°    0.9863<-18.15°   1.001<-12.81°    0.9683<-21.6°    0.97<-22.7°     0.9668<-23.13°   0.985<-21.51°   0.9771<-18.71°
  Line_3-5      0.984<-18.68°   0.9797<-19.12°   0.98<-19.13°    0.9863<-18.15°   1.001<-12.82°    0.9683<-21.59°   0.97<-22.69°    0.9668<-23.13°   0.985<-21.5°    0.9771<-18.7°
  Line_5-6      0.984<-18.69°   0.9797<-19.13°   0.98<-19.14°    0.9863<-18.15°   1.001<-12.81°    0.9683<-21.6°    0.97<-22.7°     0.9668<-23.13°   0.985<-21.51°   0.9771<-18.71°
  Line_6-7      0.984<-18.54°   0.9797<-18.98°   0.98<-18.99°    0.9863<-18.01°   1.001<-12.69°    0.9683<-21.47°   0.97<-22.58°    0.9668<-23.02°   0.985<-21.41°   0.9771<-18.59°
  Line_8-9      0.984<-41.33°   0.979<-41.75°    0.98<-41.77°    0.9822<-40.7°    0.9782<-35.57°   0.9675<-42°      0.97<-41.85°    0.9661<-41.27°   0.985<-36.88°   0.9653<-37.44°
  Line_8-5      0.984<NaN°      NaN<NaN°         0.98<NaN°       NaN<NaN°         NaN<NaN°         NaN<NaN°         0.97<NaN°       NaN<NaN°         0.985<NaN°      NaN<NaN°
  Line_9-10     0.984<NaN°      NaN<NaN°         0.98<NaN°       NaN<NaN°         NaN<NaN°         NaN<NaN°         0.97<NaN°       NaN<NaN°         0.985<NaN°      NaN<NaN°
  Line_4-11     0.984<-18.57°   0.9797<-19.01°   0.98<-19.02°    0.9863<-18.04°   1.001<-12.71°    0.9683<-21.5°    0.97<-22.6°     0.9668<-23.04°   0.985<-21.43°   0.9771<-18.61°
  Line_5-11     0.984<-18.59°   0.9797<-19.03°   0.98<-19.04°    0.9863<-18.06°   1.001<-12.72°    0.9683<-21.51°   0.97<-22.62°    0.9668<-23.06°   0.985<-21.44°   0.9771<-18.63°
  Line_11-12    0.984<-18.51°   0.9797<-18.95°   0.98<-18.96°    0.9863<-17.98°   1.001<-12.67°    0.9683<-21.44°   0.97<-22.55°    0.9668<-23°      0.985<-21.39°   0.9771<-18.56°
  Line_2-12     0.984<-18.52°   0.9797<-18.96°   0.98<-18.97°    0.9863<-17.99°   1.001<-12.71°    0.9683<-21.46°   0.97<-22.57°    0.9668<-23.01°   0.985<-21.4°    0.9771<-18.57°
  Line_3-12     0.984<-18.49°   0.9797<-18.93°   0.98<-18.94°    0.9863<-17.97°   1.001<-12.67°    0.9683<-21.43°   0.97<-22.54°    0.9668<-22.99°   0.985<-21.38°   0.9771<-18.55°
  Line_7-12     0.984<-18.51°   0.9797<-18.95°   0.98<-18.96°    0.9863<-17.98°   1.001<-12.68°    0.9683<-21.44°   0.97<-22.56°    0.9668<-23°      0.985<-21.4°    0.9771<-18.57°
  Line_11-13    0.984<-18.64°   0.9797<-19.08°   0.98<-19.09°    0.9863<-18.1°    1.001<-12.71°    0.9683<-21.55°   0.97<-22.66°    0.9668<-23.09°   0.985<-21.47°   0.9771<-18.67°
  Line_12-14    0.984<-18.54°   0.9797<-18.98°   0.98<-19°       0.9863<-18.01°   1.001<-12.67°    0.9683<-21.47°   0.97<-22.58°    0.9668<-23.02°   0.985<-21.41°   0.9771<-18.59°
  Line_13-15    0.984<-18.5°    0.9797<-18.94°   0.98<-18.95°    0.9863<-17.97°   1.001<-12.67°    0.9683<-21.44°   0.97<-22.55°    0.9668<-22.99°   0.985<-21.39°   0.9771<-18.56°
  Line_14-15    0.984<-18.5°    0.9797<-18.94°   0.98<-18.96°    0.9863<-17.98°   1.001<-12.67°    0.9683<-21.44°   0.97<-22.55°    0.9668<-22.99°   0.985<-21.39°   0.9771<-18.56°
  Line_12-16    0.984<-18.5°    0.9797<-18.94°   0.98<-18.95°    0.9863<-17.97°   1.001<-12.67°    0.9683<-21.43°   0.97<-22.55°    0.9668<-22.99°   0.985<-21.39°   0.9771<-18.55°
  Line_15-17    0.984<-19.09°   0.9797<-19.52°   0.98<-19.53°    0.9865<-18.53°   1.001<-12.81°    0.9684<-21.93°   0.97<-23°       0.9668<-23.41°   0.985<-21.72°   0.9769<-19.02°
  Line_16-17    0.984<-18.52°   0.9797<-18.96°   0.98<-18.97°    0.9863<-17.99°   1.001<-12.71°    0.9683<-21.45°   0.97<-22.57°    0.9668<-23.01°   0.985<-21.4°    0.9771<-18.57°
  Line_17-18    0.984<-18.91°   0.9797<-19.33°   0.98<-19.35°    0.9865<-18.33°   1.002<-12.77°    0.9684<-21.75°   0.97<-22.84°    0.9668<-23.26°   0.985<-21.61°   0.977<-18.88°
  Line_18-19    0.984<-18.57°   0.9797<-19.01°   0.98<-19.02°    0.9863<-18.03°   1.001<-12.67°    0.9683<-21.49°   0.97<-22.6°     0.9668<-23.04°   0.985<-21.42°   0.9771<-18.61°
```

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  Line Removed       V44              V45              V46             V47             V48             V49             V50             V51              V52              V53
  Line_1-2      0.9845<-16.08°   0.9864<-14.25°   1.005<-11.45°   1.017<-9.23°    1.021<-10.02°   1.025<-9.013°   1.001<-11.05°   0.9669<-13.68°   0.9568<-14.63°   0.946<-15.61°
  Line_1-3      0.9844<-16.12°   0.9864<-14.29°   1.005<-11.48°   1.017<-9.252°   1.021<-10.04°   1.025<-9.038°   1.001<-11.08°   0.9669<-13.7°    0.9568<-14.66°   0.946<-15.63°
  Line_4-5      0.9844<-16.18°   0.9863<-14.34°   1.005<-11.52°   1.017<-9.285°   1.021<-10.08°   1.025<-9.076°   1.001<-11.12°   0.9669<-13.74°   0.9568<-14.69°   0.946<-15.67°
  Line_3-5      0.9844<-16.18°   0.9863<-14.34°   1.005<-11.52°   1.017<-9.286°   1.021<-10.08°   1.025<-9.076°   1.001<-11.12°   0.9669<-13.74°   0.9568<-14.69°   0.946<-15.67°
  Line_5-6      0.9844<-16.18°   0.9863<-14.34°   1.005<-11.52°   1.017<-9.286°   1.021<-10.08°   1.025<-9.077°   1.001<-11.12°   0.9669<-13.74°   0.9568<-14.69°   0.946<-15.67°
  Line_6-7      0.9844<-16.1°    0.9864<-14.27°   1.005<-11.47°   1.017<-9.242°   1.021<-10.03°   1.025<-9.027°   1.001<-11.07°   0.9669<-13.69°   0.9568<-14.65°   0.946<-15.62°
  Line_8-9      0.9689<-29.02°   0.9752<-25.02°   1.005<-20.61°   1.012<-16.9°    1.021<-18.77°   1.025<-17.66°   1.001<-19.62°   0.9671<-22.14°   0.957<-23.06°    0.9461<-23.96°
  Line_8-5      NaN<NaN°         NaN<NaN°         1.005<NaN°      NaN<NaN°        NaN<NaN°        1.025<NaN°      NaN<NaN°        NaN<NaN°         NaN<NaN°         NaN<NaN°
  Line_9-10     NaN<NaN°         NaN<NaN°         1.005<NaN°      NaN<NaN°        NaN<NaN°        1.025<NaN°      NaN<NaN°        NaN<NaN°         NaN<NaN°         NaN<NaN°
  Line_4-11     0.9844<-16.12°   0.9864<-14.29°   1.005<-11.48°   1.017<-9.25°    1.021<-10.04°   1.025<-9.036°   1.001<-11.08°   0.9669<-13.7°    0.9568<-14.65°   0.946<-15.63°
  Line_5-11     0.9844<-16.13°   0.9864<-14.29°   1.005<-11.49°   1.017<-9.255°   1.021<-10.04°   1.025<-9.042°   1.001<-11.08°   0.9669<-13.7°    0.9568<-14.66°   0.946<-15.64°
  Line_11-12    0.9844<-16.09°   0.9864<-14.26°   1.005<-11.46°   1.017<-9.233°   1.021<-10.02°   1.025<-9.017°   1.001<-11.06°   0.9669<-13.68°   0.9568<-14.63°   0.946<-15.61°
  Line_2-12     0.9844<-16.1°    0.9864<-14.27°   1.005<-11.47°   1.017<-9.24°    1.021<-10.03°   1.025<-9.025°   1.001<-11.07°   0.9669<-13.69°   0.9568<-14.64°   0.946<-15.62°
  Line_3-12     0.9845<-16.08°   0.9864<-14.26°   1.005<-11.45°   1.017<-9.23°    1.021<-10.02°   1.025<-9.013°   1.001<-11.06°   0.9669<-13.68°   0.9568<-14.63°   0.946<-15.61°
  Line_7-12     0.9844<-16.09°   0.9864<-14.26°   1.005<-11.46°   1.017<-9.234°   1.021<-10.02°   1.025<-9.018°   1.001<-11.06°   0.9669<-13.68°   0.9568<-14.64°   0.946<-15.61°
  Line_11-13    0.9844<-16.15°   0.9863<-14.31°   1.005<-11.5°    1.017<-9.263°   1.021<-10.05°   1.025<-9.05°    1.001<-11.09°   0.9669<-13.71°   0.9568<-14.67°   0.946<-15.64°
  Line_12-14    0.9844<-16.1°    0.9864<-14.27°   1.005<-11.47°   1.017<-9.239°   1.021<-10.03°   1.025<-9.023°   1.001<-11.06°   0.9669<-13.69°   0.9568<-14.64°   0.946<-15.62°
  Line_13-15    0.9845<-16.08°   0.9864<-14.26°   1.005<-11.46°   1.017<-9.232°   1.021<-10.02°   1.025<-9.015°   1.001<-11.06°   0.9669<-13.68°   0.9568<-14.63°   0.946<-15.61°
  Line_14-15    0.9845<-16.08°   0.9864<-14.26°   1.005<-11.46°   1.017<-9.231°   1.021<-10.02°   1.025<-9.015°   1.001<-11.06°   0.9669<-13.68°   0.9568<-14.63°   0.946<-15.61°
  Line_12-16    0.9845<-16.08°   0.9864<-14.26°   1.005<-11.45°   1.017<-9.23°    1.021<-10.02°   1.025<-9.014°   1.001<-11.06°   0.9669<-13.68°   0.9568<-14.63°   0.946<-15.61°
  Line_15-17    0.9842<-16.36°   0.9862<-14.47°   1.005<-11.62°   1.017<-9.36°    1.021<-10.16°   1.025<-9.156°   1.001<-11.19°   0.9669<-13.81°   0.9568<-14.76°   0.946<-15.73°
  Line_16-17    0.9844<-16.1°    0.9864<-14.27°   1.005<-11.47°   1.017<-9.24°    1.021<-10.03°   1.025<-9.024°   1.001<-11.07°   0.9669<-13.69°   0.9568<-14.64°   0.946<-15.62°
  Line_17-18    0.9842<-16.28°   0.9862<-14.4°    1.005<-11.57°   1.017<-9.319°   1.021<-10.12°   1.025<-9.11°    1.001<-11.15°   0.9669<-13.77°   0.9568<-14.72°   0.946<-15.69°
  Line_18-19    0.9844<-16.12°   0.9864<-14.28°   1.005<-11.47°   1.017<-9.244°   1.021<-10.03°   1.025<-9.028°   1.001<-11.07°   0.9669<-13.69°   0.9568<-14.64°   0.946<-15.62°
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  Line Removed       V54             V55             V56             V57              V58              V59             V60              V61             V62             V63
  Line_1-2      0.955<-14.7°    0.952<-14.99°   0.954<-14.8°    0.9706<-13.59°   0.959<-14.45°    0.985<-10.61°   0.9932<-6.817°   0.995<-5.926°   0.998<-6.541°   0.9926<-7.187°
  Line_1-3      0.955<-14.72°   0.952<-15.01°   0.954<-14.83°   0.9706<-13.62°   0.959<-14.48°    0.985<-10.63°   0.9932<-6.839°   0.995<-5.947°   0.998<-6.563°   0.9926<-7.209°
  Line_4-5      0.955<-14.76°   0.952<-15.05°   0.954<-14.86°   0.9706<-13.65°   0.959<-14.51°    0.985<-10.66°   0.9932<-6.87°    0.995<-5.978°   0.998<-6.594°   0.9926<-7.24°
  Line_3-5      0.955<-14.76°   0.952<-15.05°   0.954<-14.86°   0.9706<-13.65°   0.959<-14.51°    0.985<-10.67°   0.9932<-6.873°   0.995<-5.98°    0.998<-6.596°   0.9926<-7.242°
  Line_5-6      0.955<-14.76°   0.952<-15.05°   0.954<-14.86°   0.9706<-13.65°   0.959<-14.51°    0.985<-10.67°   0.9932<-6.872°   0.995<-5.98°    0.998<-6.595°   0.9926<-7.241°
  Line_6-7      0.955<-14.71°   0.952<-15°      0.954<-14.82°   0.9706<-13.61°   0.959<-14.46°    0.985<-10.62°   0.9932<-6.829°   0.995<-5.937°   0.998<-6.552°   0.9926<-7.198°
  Line_8-9      0.955<-22.99°   0.952<-23.26°   0.954<-23.09°   0.9707<-22°      0.9592<-22.84°   0.985<-18.59°   0.9931<-14.7°    0.995<-13.79°   0.998<-14.44°   0.9923<-15.04°
  Line_8-5      0.955<NaN°      0.952<NaN°      0.954<NaN°      NaN<NaN°         NaN<NaN°         0.985<NaN°      NaN<NaN°         0.995<NaN°      0.998<NaN°      NaN<NaN°
  Line_9-10     0.955<NaN°      0.952<NaN°      0.954<NaN°      NaN<NaN°         NaN<NaN°         0.985<NaN°      NaN<NaN°         0.995<NaN°      0.998<NaN°      NaN<NaN°
  Line_4-11     0.955<-14.72°   0.952<-15.01°   0.954<-14.82°   0.9706<-13.62°   0.959<-14.47°    0.985<-10.63°   0.9932<-6.836°   0.995<-5.944°   0.998<-6.559°   0.9926<-7.205°
  Line_5-11     0.955<-14.73°   0.952<-15.02°   0.954<-14.83°   0.9706<-13.62°   0.959<-14.48°    0.985<-10.63°   0.9932<-6.84°    0.995<-5.948°   0.998<-6.564°   0.9926<-7.21°
  Line_11-12    0.955<-14.7°    0.952<-14.99°   0.954<-14.81°   0.9706<-13.6°    0.959<-14.45°    0.985<-10.61°   0.9932<-6.819°   0.995<-5.927°   0.998<-6.543°   0.9926<-7.189°
  Line_2-12     0.955<-14.71°   0.952<-15°      0.954<-14.82°   0.9706<-13.61°   0.959<-14.46°    0.985<-10.62°   0.9932<-6.829°   0.995<-5.937°   0.998<-6.552°   0.9926<-7.199°
  Line_3-12     0.955<-14.7°    0.952<-14.99°   0.954<-14.8°    0.9706<-13.59°   0.959<-14.45°    0.985<-10.61°   0.9932<-6.818°   0.995<-5.926°   0.998<-6.541°   0.9926<-7.188°
  Line_7-12     0.955<-14.7°    0.952<-14.99°   0.954<-14.81°   0.9706<-13.6°    0.959<-14.46°    0.985<-10.61°   0.9932<-6.821°   0.995<-5.929°   0.998<-6.544°   0.9926<-7.191°
  Line_11-13    0.955<-14.73°   0.952<-15.02°   0.954<-14.83°   0.9706<-13.63°   0.959<-14.48°    0.985<-10.64°   0.9932<-6.843°   0.995<-5.951°   0.998<-6.566°   0.9926<-7.212°
  Line_12-14    0.955<-14.71°   0.952<-15°      0.954<-14.81°   0.9706<-13.6°    0.959<-14.46°    0.985<-10.62°   0.9932<-6.822°   0.995<-5.93°    0.998<-6.545°   0.9926<-7.192°
  Line_13-15    0.955<-14.7°    0.952<-14.99°   0.954<-14.81°   0.9706<-13.6°    0.959<-14.45°    0.985<-10.61°   0.9932<-6.819°   0.995<-5.927°   0.998<-6.542°   0.9926<-7.189°
  Line_14-15    0.955<-14.7°    0.952<-14.99°   0.954<-14.8°    0.9706<-13.6°    0.959<-14.45°    0.985<-10.61°   0.9932<-6.818°   0.995<-5.926°   0.998<-6.541°   0.9926<-7.188°
  Line_12-16    0.955<-14.7°    0.952<-14.99°   0.954<-14.8°    0.9706<-13.59°   0.959<-14.45°    0.985<-10.61°   0.9932<-6.817°   0.995<-5.925°   0.998<-6.54°    0.9926<-7.187°
  Line_15-17    0.955<-14.82°   0.952<-15.11°   0.954<-14.92°   0.9706<-13.72°   0.959<-14.58°    0.985<-10.71°   0.9932<-6.911°   0.995<-6.019°   0.998<-6.636°   0.9925<-7.28°
  Line_16-17    0.955<-14.71°   0.952<-15°      0.954<-14.81°   0.9706<-13.61°   0.959<-14.46°    0.985<-10.62°   0.9932<-6.829°   0.995<-5.937°   0.998<-6.552°   0.9926<-7.198°
  Line_17-18    0.955<-14.78°   0.952<-15.07°   0.954<-14.89°   0.9706<-13.68°   0.959<-14.54°    0.985<-10.68°   0.9932<-6.883°   0.995<-5.99°    0.998<-6.607°   0.9926<-7.252°
  Line_18-19    0.955<-14.71°   0.952<-15°      0.954<-14.81°   0.9706<-13.61°   0.959<-14.46°    0.985<-10.62°   0.9932<-6.825°   0.995<-5.933°   0.998<-6.548°   0.9926<-7.195°
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  Line Removed       V64              V65             V66            V67            V68             V69         V70             V71              V72             V73
  Line_1-2      0.9983<-5.451°   1.005<-2.307°   1.05<-2.479°   1.02<-5.122°   1.012<-2.482°   1.035<0°    0.984<-7.398°   0.9868<-7.808°   0.98<-8.902°    0.991<-8.02°
  Line_1-3      0.9983<-5.473°   1.005<-2.328°   1.05<-2.501°   1.02<-5.144°   1.012<-2.495°   1.035<0°    0.984<-7.417°   0.9868<-7.831°   0.98<-8.946°    0.991<-8.042°
  Line_4-5      0.9983<-5.503°   1.005<-2.357°   1.05<-2.534°   1.02<-5.176°   1.012<-2.515°   1.035<0°    0.984<-7.446°   0.9868<-7.867°   0.98<-9.017°    0.991<-8.079°
  Line_3-5      0.9983<-5.506°   1.005<-2.359°   1.05<-2.536°   1.02<-5.178°   1.012<-2.516°   1.035<0°    0.984<-7.446°   0.9868<-7.867°   0.98<-9.016°    0.991<-8.078°
  Line_5-6      0.9983<-5.505°   1.005<-2.358°   1.05<-2.535°   1.02<-5.178°   1.012<-2.515°   1.035<0°    0.984<-7.449°   0.9868<-7.87°    0.98<-9.023°    0.991<-8.082°
  Line_6-7      0.9983<-5.462°   1.005<-2.317°   1.05<-2.491°   1.02<-5.134°   1.012<-2.488°   1.035<0°    0.984<-7.411°   0.9868<-7.824°   0.98<-8.933°    0.991<-8.035°
  Line_8-9      0.9981<-13.24°   1.005<-9.916°   1.05<-10.53°   1.02<-13.1°    1.012<-7.471°   1.035<0°    0.984<-13.35°   0.9857<-15.09°   0.98<-22.87°    0.991<-15.31°
  Line_8-5      NaN<NaN°         1.005<NaN°      1.05<NaN°      NaN<NaN°       NaN<NaN°        1.035<0°    0.984<NaN°      NaN<NaN°         0.98<NaN°       0.991<NaN°
  Line_9-10     NaN<NaN°         1.005<NaN°      1.05<NaN°      NaN<NaN°       NaN<NaN°        1.035<0°    0.984<NaN°      NaN<NaN°         0.98<NaN°       0.991<NaN°
  Line_4-11     0.9983<-5.469°   1.005<-2.324°   1.05<-2.498°   1.02<-5.141°   1.012<-2.493°   1.035<0°    0.984<-7.418°   0.9868<-7.832°   0.98<-8.949°    0.991<-8.044°
  Line_5-11     0.9983<-5.474°   1.005<-2.328°   1.05<-2.503°   1.02<-5.146°   1.012<-2.496°   1.035<0°    0.984<-7.422°   0.9868<-7.838°   0.98<-8.96°     0.991<-8.049°
  Line_11-12    0.9983<-5.453°   1.005<-2.308°   1.05<-2.481°   1.02<-5.124°   1.012<-2.483°   1.035<0°    0.984<-7.405°   0.9868<-7.816°   0.98<-8.918°    0.991<-8.028°
  Line_2-12     0.9983<-5.463°   1.005<-2.318°   1.05<-2.491°   1.02<-5.134°   1.012<-2.489°   1.035<0°    0.984<-7.405°   0.9868<-7.817°   0.98<-8.919°    0.991<-8.029°
  Line_3-12     0.9983<-5.452°   1.005<-2.307°   1.05<-2.479°   1.02<-5.123°   1.012<-2.482°   1.035<0°    0.984<-7.398°   0.9868<-7.808°   0.98<-8.902°    0.991<-8.02°
  Line_7-12     0.9983<-5.455°   1.005<-2.31°    1.05<-2.483°   1.02<-5.126°   1.012<-2.484°   1.035<0°    0.984<-7.403°   0.9868<-7.815°   0.98<-8.914°    0.991<-8.026°
  Line_11-13    0.9983<-5.475°   1.005<-2.328°   1.05<-2.507°   1.02<-5.149°   1.012<-2.496°   1.035<0°    0.984<-7.422°   0.9868<-7.838°   0.98<-8.96°     0.991<-8.05°
  Line_12-14    0.9983<-5.455°   1.005<-2.31°    1.05<-2.485°   1.02<-5.128°   1.012<-2.484°   1.035<0°    0.984<-7.404°   0.9868<-7.816°   0.98<-8.917°    0.991<-8.027°
  Line_13-15    0.9983<-5.453°   1.005<-2.308°   1.05<-2.481°   1.02<-5.124°   1.012<-2.483°   1.035<0°    0.984<-7.4°     0.9868<-7.81°    0.98<-8.906°    0.991<-8.022°
  Line_14-15    0.9983<-5.452°   1.005<-2.307°   1.05<-2.48°    1.02<-5.123°   1.012<-2.482°   1.035<0°    0.984<-7.399°   0.9868<-7.81°    0.98<-8.905°    0.991<-8.021°
  Line_12-16    0.9983<-5.451°   1.005<-2.306°   1.05<-2.479°   1.02<-5.122°   1.012<-2.481°   1.035<0°    0.984<-7.405°   0.9868<-7.816°   0.98<-8.919°    0.991<-8.028°
  Line_15-17    0.9983<-5.54°    1.005<-2.384°   1.05<-2.583°   1.02<-5.223°   1.012<-2.53°    1.035<0°    0.984<-7.339°   0.9868<-7.734°   0.98<-8.746°    0.991<-7.945°
  Line_16-17    0.9983<-5.462°   1.005<-2.318°   1.05<-2.49°    1.02<-5.133°   1.012<-2.489°   1.035<0°    0.984<-7.394°   0.9868<-7.803°   0.98<-8.891°    0.991<-8.015°
  Line_17-18    0.9983<-5.513°   1.005<-2.362°   1.05<-2.551°   1.02<-5.192°   1.012<-2.517°   1.035<0°    0.984<-7.413°   0.9868<-7.825°   0.98<-8.932°    0.991<-8.037°
  Line_18-19    0.9983<-5.458°   1.005<-2.312°   1.05<-2.488°   1.02<-5.131°   1.012<-2.485°   1.035<0°    0.984<-7.396°   0.9868<-7.806°   0.98<-8.896°    0.991<-8.017°
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  Line Removed       V74             V75             V76             V77             V78             V79             V80             V81             V82              V83
  Line_1-2      0.958<-8.359°   0.9673<-7.1°    0.943<-8.252°   1.006<-3.329°   1.003<-3.637°   1.009<-3.344°   1.04<-1.118°    1.028<-2.038°   0.9885<-2.819°   0.9844<-1.627°
  Line_1-3      0.958<-8.371°   0.9673<-7.111°  0.943<-8.262°   1.006<-3.338°   1.003<-3.646°   1.009<-3.354°   1.04<-1.128°    1.028<-2.051°   0.9885<-2.828°   0.9844<-1.636°
  Line_4-5      0.958<-8.391°   0.9673<-7.127°  0.943<-8.277°   1.006<-3.351°   1.003<-3.658°   1.009<-3.367°   1.04<-1.142°    1.028<-2.068°   0.9885<-2.841°   0.9844<-1.65°
  Line_3-5      0.958<-8.391°   0.9673<-7.127°  0.943<-8.277°   1.006<-3.351°   1.003<-3.659°   1.009<-3.368°   1.04<-1.143°    1.028<-2.07°    0.9885<-2.842°   0.9844<-1.651°
  Line_5-6      0.958<-8.392°   0.9673<-7.129°  0.943<-8.278°   1.006<-3.351°   1.003<-3.659°   1.009<-3.367°   1.04<-1.143°    1.028<-2.069°   0.9885<-2.842°   0.9844<-1.651°
  Line_6-7      0.958<-8.367°   0.9673<-7.107°  0.943<-8.258°   1.006<-3.334°   1.003<-3.642°   1.009<-3.349°   1.04<-1.123°    1.028<-2.045°   0.9885<-2.824°   0.9844<-1.632°
  Line_8-9      0.958<-12.46°   0.9653<-10.57°  0.943<-11.58°   1.006<-6.39°    1.003<-6.768°   1.009<-6.61°    1.04<-4.76°     1.028<-6.542°   0.9885<-6.146°   0.9844<-4.976°
  Line_8-5      0.958<NaN°      NaN<NaN°        0.943<NaN°      1.006<NaN°      NaN<NaN°        NaN<NaN°        1.04<NaN°       NaN<NaN°        NaN<NaN°         NaN<NaN°
  Line_9-10     0.958<NaN°      NaN<NaN°        0.943<NaN°      1.006<NaN°      NaN<NaN°        NaN<NaN°        1.04<NaN°       NaN<NaN°        NaN<NaN°         NaN<NaN°
  Line_4-11     0.958<-8.371°   0.9673<-7.111°  0.943<-8.262°   1.006<-3.337°   1.003<-3.644°   1.009<-3.352°   1.04<-1.126°    1.028<-2.048°   0.9885<-2.827°   0.9844<-1.635°
  Line_5-11     0.958<-8.375°   0.9673<-7.114°  0.943<-8.264°   1.006<-3.339°   1.003<-3.646°   1.009<-3.354°   1.04<-1.128°    1.028<-2.051°   0.9885<-2.829°   0.9844<-1.637°
  Line_11-12    0.958<-8.363°   0.9673<-7.104°  0.943<-8.255°   1.006<-3.331°   1.003<-3.638°   1.009<-3.346°   1.04<-1.119°    1.028<-2.04°    0.9885<-2.82°    0.9844<-1.628°
  Line_2-12     0.958<-8.364°   0.9673<-7.105°  0.943<-8.257°   1.006<-3.334°   1.003<-3.641°   1.009<-3.349°   1.04<-1.123°    1.028<-2.045°   0.9885<-2.824°   0.9844<-1.632°
  Line_3-12     0.958<-8.359°   0.9673<-7.101°  0.943<-8.253°   1.006<-3.33°    1.003<-3.637°   1.009<-3.345°   1.04<-1.118°    1.028<-2.039°   0.9885<-2.819°   0.9844<-1.627°
  Line_7-12     0.958<-8.362°   0.9673<-7.103°  0.943<-8.255°   1.006<-3.331°   1.003<-3.638°   1.009<-3.346°   1.04<-1.119°    1.028<-2.04°    0.9885<-2.82°    0.9844<-1.629°
  Line_11-13    0.958<-8.375°   0.9673<-7.114°  0.943<-8.264°   1.006<-3.339°   1.003<-3.646°   1.009<-3.354°   1.04<-1.129°    1.028<-2.051°   0.9885<-2.829°   0.9844<-1.637°
  Line_12-14    0.958<-8.363°   0.9673<-7.104°  0.943<-8.255°   1.006<-3.331°   1.003<-3.638°   1.009<-3.346°   1.04<-1.119°    1.028<-2.04°    0.9885<-2.82°    0.9844<-1.629°
  Line_13-15    0.958<-8.36°    0.9673<-7.101°  0.943<-8.253°   1.006<-3.33°    1.003<-3.637°   1.009<-3.345°   1.04<-1.118°    1.028<-2.039°   0.9885<-2.819°   0.9844<-1.628°
  Line_14-15    0.958<-8.36°    0.9673<-7.101°  0.943<-8.253°   1.006<-3.33°    1.003<-3.637°   1.009<-3.345°   1.04<-1.118°    1.028<-2.038°   0.9885<-2.819°   0.9844<-1.627°
  Line_12-16    0.958<-8.363°   0.9673<-7.103°  0.943<-8.254°   1.006<-3.33°    1.003<-3.637°   1.009<-3.345°   1.04<-1.118°    1.028<-2.038°   0.9885<-2.819°   0.9844<-1.628°
  Line_15-17    0.958<-8.329°   0.9673<-7.08°   0.943<-8.246°   1.006<-3.344°   1.003<-3.653°   1.009<-3.363°   1.04<-1.143°    1.028<-2.078°   0.9885<-2.838°   0.9844<-1.647°
  Line_16-17    0.958<-8.357°   0.9673<-7.1°    0.943<-8.253°   1.006<-3.332°   1.003<-3.64°    1.009<-3.348°   1.04<-1.122°    1.028<-2.044°   0.9885<-2.822°   0.9844<-1.63°
  Line_17-18    0.958<-8.371°   0.9673<-7.112°  0.943<-8.267°   1.006<-3.347°   1.003<-3.655°   1.009<-3.364°   1.04<-1.141°    1.028<-2.069°   0.9885<-2.839°   0.9844<-1.648°
  Line_18-19    0.958<-8.358°   0.9673<-7.1°    0.943<-8.253°   1.006<-3.331°   1.003<-3.638°   1.009<-3.346°   1.04<-1.119°    1.028<-2.041°   0.9885<-2.82°    0.9844<-1.629°
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  Line Removed       V84              V85             V86              V87             V88              V89             V90              V91              V92             V93
  Line_1-2      0.9797<0.9085°   0.985<2.463°    0.9867<1.094°    1.015<1.353°    0.9875<5.597°    1.005<9.655°    0.985<3.245°     0.98<3.257°      0.99<3.787°     0.9854<0.7547°
  Line_1-3      0.9797<0.8991°   0.985<2.454°    0.9867<1.084°    1.015<1.344°    0.9875<5.588°    1.005<9.645°    0.985<3.235°     0.98<3.247°      0.99<3.777°     0.9854<0.7451°
  Line_4-5      0.9797<0.8855°   0.985<2.44°     0.9867<1.071°    1.015<1.33°     0.9875<5.574°    1.005<9.632°    0.985<3.221°     0.98<3.234°      0.99<3.763°     0.9854<0.7311°
  Line_3-5      0.9797<0.8846°   0.985<2.439°    0.9867<1.07°     1.015<1.329°    0.9875<5.573°    1.005<9.631°    0.985<3.221°     0.98<3.233°      0.99<3.763°     0.9854<0.7302°
  Line_5-6      0.9797<0.8847°   0.985<2.44°     0.9867<1.07°     1.015<1.329°    0.9875<5.573°    1.005<9.631°    0.985<3.221°     0.98<3.233°      0.99<3.763°     0.9854<0.7304°
  Line_6-7      0.9797<0.9035°   0.985<2.458°    0.9867<1.089°    1.015<1.348°    0.9875<5.592°    1.005<9.65°     0.985<3.24°      0.98<3.252°      0.99<3.782°     0.9854<0.7497°
  Line_8-9      0.9797<-2.474°   0.985<-0.936°   0.9867<-2.305°   1.015<-2.046°   0.9875<2.169°    1.005<6.207°    0.985<-0.2074°   0.98<-0.2011°    0.99<0.3201°    0.9854<-2.72°
  Line_8-5      NaN<NaN°         0.985<NaN°      NaN<NaN°         1.015<NaN°      NaN<NaN°         1.005<NaN°      0.985<NaN°       0.98<NaN°        0.99<NaN°       NaN<NaN°
  Line_9-10     NaN<NaN°         0.985<NaN°      NaN<NaN°         1.015<NaN°      NaN<NaN°         1.005<NaN°      0.985<NaN°       0.98<NaN°        0.99<NaN°       NaN<NaN°
  Line_4-11     0.9797<0.9004°   0.985<2.455°    0.9867<1.086°    1.015<1.345°    0.9875<5.589°    1.005<9.647°    0.985<3.237°     0.98<3.249°      0.99<3.779°     0.9854<0.7465°
  Line_5-11     0.9797<0.8984°   0.985<2.453°    0.9867<1.084°    1.015<1.343°    0.9875<5.587°    1.005<9.645°    0.985<3.235°     0.98<3.247°      0.99<3.777°     0.9854<0.7444°
  Line_11-12    0.9797<0.9072°   0.985<2.462°    0.9867<1.093°    1.015<1.352°    0.9875<5.596°    1.005<9.654°    0.985<3.244°     0.98<3.256°      0.99<3.786°     0.9854<0.7535°
  Line_2-12     0.9797<0.9036°   0.985<2.458°    0.9867<1.089°    1.015<1.348°    0.9875<5.592°    1.005<9.65°     0.985<3.24°      0.98<3.252°      0.99<3.782°     0.9854<0.7497°
  Line_3-12     0.9797<0.9084°   0.985<2.463°    0.9867<1.094°    1.015<1.353°    0.9875<5.597°    1.005<9.655°    0.985<3.245°     0.98<3.257°      0.99<3.787°     0.9854<0.7546°
  Line_7-12     0.9797<0.9068°   0.985<2.462°    0.9867<1.092°    1.015<1.351°    0.9875<5.596°    1.005<9.653°    0.985<3.243°     0.98<3.255°      0.99<3.785°     0.9854<0.753°
  Line_11-13    0.9797<0.8982°   0.985<2.453°    0.9867<1.084°    1.015<1.343°    0.9875<5.587°    1.005<9.645°    0.985<3.234°     0.98<3.247°      0.99<3.776°     0.9854<0.7442°
  Line_12-14    0.9797<0.9068°   0.985<2.462°    0.9867<1.092°    1.015<1.352°    0.9875<5.596°    1.005<9.653°    0.985<3.243°     0.98<3.255°      0.99<3.785°     0.9854<0.7531°
  Line_13-15    0.9797<0.9078°   0.985<2.463°    0.9867<1.093°    1.015<1.352°    0.9875<5.597°    1.005<9.654°    0.985<3.244°     0.98<3.256°      0.99<3.786°     0.9854<0.754°
  Line_14-15    0.9797<0.9083°   0.985<2.463°    0.9867<1.094°    1.015<1.353°    0.9875<5.597°    1.005<9.655°    0.985<3.245°     0.98<3.257°      0.99<3.787°     0.9854<0.7546°
  Line_12-16    0.9797<0.908°    0.985<2.463°    0.9867<1.093°    1.015<1.353°    0.9875<5.597°    1.005<9.655°    0.985<3.244°     0.98<3.257°      0.99<3.787°     0.9854<0.7543°
  Line_15-17    0.9797<0.888°    0.985<2.443°    0.9867<1.073°    1.015<1.332°    0.9875<5.576°    1.005<9.633°    0.985<3.223°     0.98<3.235°      0.99<3.765°     0.9854<0.7327°
  Line_16-17    0.9797<0.9051°   0.985<2.46°     0.9867<1.09°     1.015<1.35°     0.9875<5.594°    1.005<9.651°    0.985<3.241°     0.98<3.253°      0.99<3.783°     0.9854<0.7511°
  Line_17-18    0.9797<0.8876°   0.985<2.442°    0.9867<1.073°    1.015<1.332°    0.9875<5.576°    1.005<9.634°    0.985<3.223°     0.98<3.235°      0.99<3.765°     0.9854<0.733°
  Line_18-19    0.9797<0.907°    0.985<2.462°    0.9867<1.092°    1.015<1.352°    0.9875<5.596°    1.005<9.653°    0.985<3.243°     0.98<3.255°      0.99<3.785°     0.9854<0.7531°
```

```
  Line Removed       V94              V95              V96              V97             V98             V99            V100            V101              V102             V103
  Line_1-2      0.9898<-1.413°   0.9803<-2.386°   0.9923<-2.554°   1.011<-2.186°   1.024<-2.669°   1.01<-3.031°   1.017<-2.035°   0.9914<-0.447°    0.9891<2.271°    1.001<-5.636°
  Line_1-3      0.9898<-1.422°   0.9803<-2.396°   0.9923<-2.563°   1.011<-2.196°   1.024<-2.679°   1.01<-3.041°   1.017<-2.045°   0.9914<-0.4567°   0.9891<2.261°    1.001<-5.645°
  Line_4-5      0.9898<-1.436°   0.9803<-2.409°   0.9923<-2.577°   1.011<-2.21°    1.024<-2.694°   1.01<-3.055°   1.017<-2.059°   0.9914<-0.4707°   0.9891<2.248°    1.001<-5.66°
  Line_3-5      0.9898<-1.437°   0.9803<-2.41°    0.9923<-2.578°   1.011<-2.211°   1.024<-2.695°   1.01<-3.056°   1.017<-2.06°    0.9914<-0.4716°   0.9891<2.247°    1.001<-5.66°
  Line_5-6      0.9898<-1.437°   0.9803<-2.41°    0.9923<-2.578°   1.011<-2.211°   1.024<-2.694°   1.01<-3.056°   1.017<-2.06°    0.9914<-0.4714°   0.9891<2.247°    1.001<-5.66°
  Line_6-7      0.9898<-1.418°   0.9803<-2.391°   0.9923<-2.559°   1.011<-2.191°   1.024<-2.674°   1.01<-3.036°   1.017<-2.04°    0.9914<-0.4521°   0.9891<2.266°    1.001<-5.641°
  Line_8-9      0.9898<-4.895°   0.9803<-5.86°    0.9922<-6.016°   1.011<-5.738°   1.024<-6.265°   1.01<-6.584°   1.017<-5.553°   0.9914<-3.943°    0.9891<-1.206°   1.001<-9.153°
  Line_8-5      NaN<NaN°         NaN<NaN°         NaN<NaN°         NaN<NaN°        NaN<NaN°        1.01<NaN°      1.017<NaN°      NaN<NaN°          NaN<NaN°         1.001<NaN°
  Line_9-10     NaN<NaN°         NaN<NaN°         NaN<NaN°         NaN<NaN°        NaN<NaN°        1.01<NaN°      1.017<NaN°      NaN<NaN°          NaN<NaN°         1.001<NaN°
  Line_4-11     0.9898<-1.421°   0.9803<-2.394°   0.9923<-2.562°   1.011<-2.194°   1.024<-2.678°   1.01<-3.039°   1.017<-2.043°   0.9914<-0.4553°   0.9891<2.263°    1.001<-5.644°
  Line_5-11     0.9898<-1.423°   0.9803<-2.396°   0.9923<-2.564°   1.011<-2.197°   1.024<-2.68°    1.01<-3.042°   1.017<-2.045°   0.9914<-0.4573°   0.9891<2.261°    1.001<-5.646°
  Line_11-12    0.9898<-1.414°   0.9803<-2.387°   0.9923<-2.555°   1.011<-2.187°   1.024<-2.67°    1.01<-3.032°   1.017<-2.036°   0.9914<-0.4482°   0.9891<2.27°     1.001<-5.637°
  Line_2-12     0.9898<-1.418°   0.9803<-2.391°   0.9923<-2.559°   1.011<-2.191°   1.024<-2.674°   1.01<-3.036°   1.017<-2.04°    0.9914<-0.4521°   0.9891<2.266°    1.001<-5.641°
  Line_3-12     0.9898<-1.413°   0.9803<-2.386°   0.9923<-2.554°   1.011<-2.186°   1.024<-2.669°   1.01<-3.031°   1.017<-2.035°   0.9914<-0.4471°   0.9891<2.271°    1.001<-5.636°
  Line_7-12     0.9898<-1.414°   0.9803<-2.388°   0.9923<-2.555°   1.011<-2.188°   1.024<-2.671°   1.01<-3.033°   1.017<-2.037°   0.9914<-0.4487°   0.9891<2.269°    1.001<-5.637°
  Line_11-13    0.9898<-1.423°   0.9803<-2.396°   0.9923<-2.564°   1.011<-2.197°   1.024<-2.68°    1.01<-3.042°   1.017<-2.046°   0.9914<-0.4575°   0.9891<2.261°    1.001<-5.646°
  Line_12-14    0.9898<-1.414°   0.9803<-2.388°   0.9923<-2.555°   1.011<-2.188°   1.024<-2.671°   1.01<-3.033°   1.017<-2.037°   0.9914<-0.4487°   0.9891<2.269°    1.001<-5.637°
  Line_13-15    0.9898<-1.413°   0.9803<-2.387°   0.9923<-2.554°   1.011<-2.187°   1.024<-2.67°    1.01<-3.032°   1.017<-2.036°   0.9914<-0.4477°   0.9891<2.27°     1.001<-5.636°
  Line_14-15    0.9898<-1.413°   0.9803<-2.386°   0.9923<-2.554°   1.011<-2.186°   1.024<-2.669°   1.01<-3.031°   1.017<-2.035°   0.9914<-0.4471°   0.9891<2.271°    1.001<-5.636°
  Line_12-16    0.9898<-1.413°   0.9803<-2.386°   0.9923<-2.554°   1.011<-2.187°   1.024<-2.67°    1.01<-3.031°   1.017<-2.035°   0.9914<-0.4474°   0.9891<2.271°    1.001<-5.636°
  Line_15-17    0.9898<-1.435°   0.9803<-2.408°   0.9923<-2.575°   1.011<-2.209°   1.024<-2.693°   1.01<-3.055°   1.017<-2.058°   0.9914<-0.4694°   0.9891<2.249°    1.001<-5.658°
  Line_16-17    0.9898<-1.416°   0.9803<-2.39°    0.9923<-2.557°   1.011<-2.19°    1.024<-2.673°   1.01<-3.035°   1.017<-2.039°   0.9914<-0.4507°   0.9891<2.268°    1.001<-5.639°
  Line_17-18    0.9898<-1.434°   0.9803<-2.408°   0.9923<-2.575°   1.011<-2.208°   1.024<-2.692°   1.01<-3.053°   1.017<-2.057°   0.9914<-0.4689°   0.9891<2.249°    1.001<-5.658°
  Line_18-19    0.9898<-1.414°   0.9803<-2.387°   0.9923<-2.555°   1.011<-2.188°   1.024<-2.671°   1.01<-3.033°   1.017<-2.037°   0.9914<-0.4486°   0.9891<2.27°     1.001<-5.637°
```

```
  Line Removed       V104            V105            V106             V107            V108             V109            V110            V111            V112            V113            V114             V115
  Line_1-2      0.971<-8.374°   0.965<-9.482°   0.9611<-9.737°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.13°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-15.99°   0.9601<-15.27°   0.96<-15.28°
  Line_1-3      0.971<-8.384°   0.965<-9.492°   0.9611<-9.746°   0.952<-12.55°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.99°   0.98<-10.35°    0.975<-15.09°   0.993<-16.11°   0.9601<-15.37°   0.96<-15.37°
  Line_4-5      0.971<-8.398°   0.965<-9.506°   0.9611<-9.76°    0.952<-12.56°   0.9662<-10.71°   0.967<-11.16°   0.973<-12°      0.98<-10.36°    0.975<-15.1°    0.993<-16.33°   0.9601<-15.52°   0.96<-15.53°
  Line_3-5      0.971<-8.399°   0.965<-9.507°   0.9611<-9.761°   0.952<-12.57°   0.9662<-10.71°   0.967<-11.16°   0.973<-12.01°   0.98<-10.36°    0.975<-15.1°    0.993<-16.31°   0.9601<-15.52°   0.96<-15.53°
  Line_5-6      0.971<-8.399°   0.965<-9.507°   0.9611<-9.761°   0.952<-12.56°   0.9662<-10.71°   0.967<-11.16°   0.973<-12.01°   0.98<-10.36°    0.975<-15.1°    0.993<-16.35°   0.9601<-15.54°   0.96<-15.55°
  Line_6-7      0.971<-8.38°    0.965<-9.487°   0.9611<-9.742°   0.952<-12.55°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.99°   0.98<-10.34°    0.975<-15.09°   0.993<-16.1°    0.9601<-15.34°   0.96<-15.35°
  Line_8-9      0.971<-11.89°   0.965<-13°      0.9611<-13.25°   0.952<-16.06°   0.9662<-14.2°    0.967<-14.65°   0.973<-15.5°    0.98<-13.85°    0.975<-18.6°    0.993<-46.18°   0.9601<-42.78°   0.96<-42.79°
  Line_8-5      0.971<NaN°      0.965<NaN°      NaN<NaN°         0.952<NaN°      NaN<NaN°         NaN<NaN°        0.973<NaN°      0.98<NaN°       0.975<NaN°      0.993<NaN°      NaN<NaN°         NaN<NaN°
  Line_9-10     0.971<NaN°      0.965<NaN°      NaN<NaN°         0.952<NaN°      NaN<NaN°         NaN<NaN°        0.973<NaN°      0.98<NaN°       0.975<NaN°      0.993<NaN°      NaN<NaN°         NaN<NaN°
  Line_4-11     0.971<-8.383°   0.965<-9.49°    0.9611<-9.745°   0.952<-12.55°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.99°   0.98<-10.34°    0.975<-15.09°   0.993<-16.15°   0.9601<-15.38°   0.96<-15.39°
  Line_5-11     0.971<-8.385°   0.965<-9.492°   0.9611<-9.747°   0.952<-12.55°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.99°   0.98<-10.35°    0.975<-15.09°   0.993<-16.19°   0.9601<-15.4°    0.96<-15.41°
  Line_11-12    0.971<-8.376°   0.965<-9.483°   0.9611<-9.738°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.14°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-16.07°   0.9601<-15.32°   0.96<-15.32°
  Line_2-12     0.971<-8.38°    0.965<-9.487°   0.9611<-9.742°   0.952<-12.55°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.99°   0.98<-10.34°    0.975<-15.09°   0.993<-16.02°   0.9601<-15.3°    0.96<-15.31°
  Line_3-12     0.971<-8.375°   0.965<-9.482°   0.9611<-9.737°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.13°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-15.99°   0.9601<-15.27°   0.96<-15.28°
  Line_7-12     0.971<-8.376°   0.965<-9.484°   0.9611<-9.738°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.14°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-16.04°   0.9601<-15.3°    0.96<-15.31°
  Line_11-13    0.971<-8.385°   0.965<-9.493°   0.9611<-9.747°   0.952<-12.55°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.99°   0.98<-10.35°    0.975<-15.09°   0.993<-16.19°   0.9601<-15.4°    0.96<-15.4°
  Line_12-14    0.971<-8.376°   0.965<-9.484°   0.9611<-9.738°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.14°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-16.06°   0.9601<-15.3°    0.96<-15.31°
  Line_13-15    0.971<-8.375°   0.965<-9.483°   0.9611<-9.737°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.14°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-16°      0.9601<-15.28°   0.96<-15.29°
  Line_14-15    0.971<-8.375°   0.965<-9.482°   0.9611<-9.737°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.13°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-16.01°   0.9601<-15.28°   0.96<-15.29°
  Line_12-16    0.971<-8.375°   0.965<-9.482°   0.9611<-9.737°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.13°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-16.08°   0.9601<-15.32°   0.96<-15.33°
  Line_15-17    0.971<-8.397°   0.965<-9.505°   0.9611<-9.759°   0.952<-12.56°   0.9662<-10.7°    0.967<-11.16°   0.973<-12°      0.98<-10.36°    0.975<-15.1°    0.993<-14.75°   0.9601<-14.57°   0.96<-14.58°
  Line_16-17    0.971<-8.378°   0.965<-9.486°   0.9611<-9.74°    0.952<-12.54°   0.9662<-10.69°   0.967<-11.14°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-15.87°   0.9601<-15.21°   0.96<-15.22°
  Line_17-18    0.971<-8.397°   0.965<-9.504°   0.9611<-9.759°   0.952<-12.56°   0.9662<-10.7°    0.967<-11.16°   0.973<-12°      0.98<-10.36°    0.975<-15.1°    0.993<-15.33°   0.9601<-15°      0.96<-15.01°
  Line_18-19    0.971<-8.376°   0.965<-9.484°   0.9611<-9.738°   0.952<-12.54°   0.9662<-10.68°   0.967<-11.14°   0.973<-11.98°   0.98<-10.34°    0.975<-15.08°   0.993<-15.81°   0.9601<-15.18°   0.96<-15.19°
```

```
 The Load flow analysis does not converge under N-1 Contingency when the following Lines removed:

  Line_8-9,   Line_8-5,   Line_9-10,   Line_23-24,   Line_23-25,   Line_8-30,   Line_26-30,   Line_30-38,   Line_38-65,   Line_65-68,   Line_68-69,   Line_71-73,   Line_85-86,   Line_86-87,   Line_110-111,   Line_110-112,   Line_68-116,   Line_12-117,

 The Load flow analysis Violated the voltage magnintude limits under N-1 Contingency when the following Lines removed:

-----------|V|<0.9  Voltage limit Violation----------

Line_1-2 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_1-3 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_4-5 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_3-5 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_5-6 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_6-7 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_4-11 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_5-11 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_11-12 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_2-12 Removed:
    "Bus2"    "Bus53"    "Bus76"    "Bus118"
Line_3-12 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_7-12 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_11-13 Removed:
    "Bus13"    "Bus53"    "Bus76"    "Bus118"
Line_12-14 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_13-15 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_14-15 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_12-16 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_15-17 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_16-17 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_17-18 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_18-19 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_19-20 Removed:
    "Bus20"    "Bus21"    "Bus53"    "Bus76"    "Bus118"
Line_15-19 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_20-21 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_21-22 Removed:
        "Bus20"    "Bus21"    "Bus53"    "Bus76"    "Bus118"
    Line_22-23 Removed:
        "Bus20"    "Bus21"    "Bus22"    "Bus53"    "Bus76"    "Bus118"
    Line_26-25 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_25-27 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_27-28 Removed:
        "Bus28"    "Bus53"    "Bus76"    "Bus118"
    Line_28-29 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_30-17 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_17-31 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_29-31 Removed:
        "Bus29"    "Bus53"    "Bus76"    "Bus118"
    Line_23-32 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_31-32 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_27-32 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_15-33 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_19-34 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_35-36 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_35-37 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_33-37 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_34-36 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_34-37 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_38-37 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_37-39 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_37-40 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_39-40 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_40-41 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_40-42 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_41-42 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_43-44 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_34-43 Removed:
        "Bus43"    "Bus53"    "Bus76"    "Bus118"
    Line_44-45 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_45-46 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_46-47 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_46-48 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_47-49 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_42-49 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_42-49 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_45-49 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_48-49 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_49-50 Removed:
        "Bus50"    "Bus53"    "Bus57"    "Bus76"    "Bus118"
    Line_49-51 Removed:
        "Bus51"    "Bus52"    "Bus53"    "Bus58"    "Bus76"    "Bus118"
    Line_51-52 Removed:
        "Bus52"    "Bus53"    "Bus76"    "Bus118"
    Line_52-53 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_53-54 Removed:
        "Bus52"    "Bus53"    "Bus76"    "Bus118"
    Line_49-54 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_49-54 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_54-55 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_54-56 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_55-56 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_56-57 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_50-57 Removed:
        "Bus53"    "Bus57"    "Bus76"    "Bus118"
    Line_56-58 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_51-58 Removed:
        "Bus53"    "Bus58"    "Bus76"    "Bus118"
    Line_54-59 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_56-59 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_56-59 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_55-59 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_59-60 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_59-61 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_60-61 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_60-62 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_61-62 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_63-59 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_63-64 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_64-61 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_64-65 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_49-66 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_49-66 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_62-66 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_62-67 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_65-66 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_66-67 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_47-69 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_49-69 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_69-70 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_24-70 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_70-71 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_24-72 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_71-72 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_70-74 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_70-75 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_69-75 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_74-75 Removed:
        "Bus53"    "Bus76"
    Line_76-77 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_69-77 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_75-77 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_77-78 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_78-79 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_77-80 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_77-80 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_79-80 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_68-81 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_81-80 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_77-82 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_82-83 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_83-84 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_83-85 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_84-85 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_85-88 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_85-89 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_88-89 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_89-90 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_89-90 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_90-91 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_89-92 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_89-92 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_91-92 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_92-93 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_92-94 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_93-94 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_94-95 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_80-96 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_82-96 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_94-96 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_80-97 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_80-98 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_80-99 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_92-100 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_94-100 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_95-96 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_96-97 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_98-100 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_99-100 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_100-101 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_92-102 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_101-102 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_100-103 Removed:
        "Bus53"    "Bus76"    "Bus118"
    Line_100-104 Removed:
        "Bus53"    "Bus76"    "Bus118"
```

```
Line_103-104 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_103-105 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_100-106 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_104-105 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_105-106 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_105-107 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_105-108 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_106-107 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_108-109 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_103-110 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_109-110 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_17-113 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_32-113 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_32-114 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_27-115 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_114-115 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_75-118 Removed:
    "Bus53"    "Bus76"    "Bus118"
Line_76-118 Removed:
    "Bus53"    "Bus76"

--------------|V|>1.10 Voltage limit Violation----------

Line_3-12 Removed:
Bus10
Line_47-49 Removed:
Bus66
Line_49-50 Removed:
Bus25
Line_55-56 Removed:
Bus10
Line_55-59 Removed:
Bus10
Line_60-61 Removed:
Bus66
Line_47-69 Removed:
Bus25
Line_70-75 Removed:
Bus66
Line_92-93 Removed:
    "Bus10"    "Bus66"
Line_100-104 Removed:
Bus10
Line_106-107 Removed:
Bus66
Line_109-110 Removed:
Bus10

-----------------------------------------------------0-------------------------------------------------
```

N-1 contingency analysis evaluate the power flow and voltage profile for the network for Generators

```
 N-1 Power flow convergence when one Generator is removed at a time

    Generator Removed At    Number_of_Iteration      Error             V1              V2              V3              V4              V5              V6              V7              V8
    ____________________    ___________________    __________    _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________

           Bus_1                    52             8.2151e-11    0.9853<-12.49°  0.9831<-12.94°  0.9855<-12.28°  0.998<-9.706°   0.9998<-9.242°  0.99<-11.88°    0.9893<-12.28°  1.015<-4.567°
           Bus_4                    57             7.2389e-11    0.955<-15.57°   0.9714<-15.08°  0.9669<-14.65°  0.9974<-10.65°  0.9985<-10.32°  0.99<-13.21°    0.9893<-13.7°   1.015<-5.567°
           Bus_6                    53             7.1451e-11    0.955<-14.24°   0.9714<-13.68°  0.967<-13.36°   0.998<-9.692°   0.9993<-9.212°  0.9937<-11.11°  0.9917<-11.85°  1.015<-4.549°
           Bus_8                    61             8.5384e-11    0.955<-16.75°   0.9714<-16.24°  0.9673<-15.85°  0.998<-12.07°   1<-11.59°       0.99<-14.41°    0.9893<-14.88°  1.021<-6.387°
           Bus_10                  108              9.553e-11    0.955<-56.77°   0.9713<-55.79°  0.9667<-56.05°  0.998<-53.21°   0.9984<-52.86°  0.99<-54.71°    0.9892<-54.79°  1.015<-49.42°
           Bus_12                   85             8.2688e-11    0.955<-22.65°   0.9604<-22.02°  0.9639<-21.65°  0.998<-17.72°   0.9983<-17.2°   0.99<-20.19°    0.9827<-20.63°  1.015<-11.77°
           Bus_15                   47             9.2377e-11    0.955<-12.88°   0.9714<-12.3°   0.967<-12°      0.998<-8.368°   0.999<-7.899°   0.99<-10.58°    0.9893<-10.99°  1.015<-2.959°
           Bus_18                   51             7.3623e-11    0.955<-15.04°   0.9714<-14.48°  0.967<-14.15°   0.998<-10.47°   0.9991<-9.988°  0.99<-12.73°    0.9893<-13.16°  1.015<-4.939°
           Bus_19                   53             6.9473e-11    0.955<-16.03°   0.9714<-15.47°  0.967<-15.14°   0.998<-11.45°   0.9991<-10.97°  0.99<-13.71°    0.9893<-14.15°  1.015<-5.91°
           Bus_24                   60             8.9874e-11    0.955<-18.4°    0.9714<-17.86°  0.967<-17.5°    0.998<-13.78°   0.9991<-13.29°  0.99<-16.07°    0.9893<-16.52°  1.015<-8.169°
           Bus_25                   63             7.3915e-11    0.955<-31.04°   0.9714<-30.5°   0.967<-30.14°   0.998<-26.42°   0.9991<-25.93°  0.99<-28.71°    0.9893<-29.16°  1.015<-20.81°
           Bus_26                   56              9.077e-11    0.955<-37.34°   0.9714<-36.79°  0.967<-36.46°   0.998<-32.77°   0.9991<-32.29°  0.99<-35.03°    0.9893<-35.46°  1.015<-27.25°
           Bus_27                   55             8.8656e-11    0.955<-14.88°   0.9714<-14.33°  0.967<-13.98°   0.998<-10.27°   0.9991<-9.787°  0.99<-12.55°    0.9893<-13°     1.015<-4.687°
           Bus_31                   55             8.1006e-11    0.955<-16.76°   0.9714<-16.22°  0.967<-15.87°   0.998<-12.15°   0.9991<-11.67°  0.99<-14.44°    0.9893<-14.88°  1.015<-6.566°
           Bus_32                   55             7.4765e-11    0.955<-15.53°   0.9714<-14.98°  0.967<-14.63°   0.998<-10.92°   0.9991<-10.44°  0.99<-13.21°    0.9893<-13.65°  1.015<-5.343°
           Bus_34                   52             9.6037e-11    0.955<-16.14°   0.9714<-15.6°   0.967<-15.25°   0.998<-11.53°   0.9991<-11.05°  0.99<-13.82°    0.9893<-14.27°  1.015<-5.936°
           Bus_36                   56             6.9976e-11    0.955<-17.48°   0.9714<-16.94°  0.967<-16.58°   0.998<-12.86°   0.9991<-12.37°  0.99<-15.15°    0.9893<-15.6°   1.015<-7.254°
           Bus_40                   51             7.5389e-11    0.955<-16.22°   0.9714<-15.68°  0.967<-15.33°   0.998<-11.61°   0.9991<-11.12°  0.99<-13.9°     0.9893<-14.35°  1.015<-6.008°
           Bus_42                   50             7.9062e-11    0.955<-15.83°   0.9714<-15.29°  0.967<-14.94°   0.998<-11.22°   0.9991<-10.73°  0.99<-13.51°    0.9893<-13.95°  1.015<-5.615°
           Bus_46                   60             8.4514e-11    0.955<-18.79°   0.9714<-18.25°  0.967<-17.89°   0.998<-14.17°   0.9991<-13.68°  0.99<-16.46°    0.9893<-16.91°  1.015<-8.558°
           Bus_49                   67             9.1837e-11    0.955<-21.1°    0.9714<-20.56°  0.967<-20.2°    0.998<-16.47°   0.9991<-15.99°  0.99<-18.77°    0.9893<-19.22°  1.015<-10.86°
           Bus_54                   58             8.7554e-11    0.955<-17.83°   0.9714<-17.3°   0.967<-16.94°   0.998<-13.21°   0.9991<-12.72°  0.99<-15.51°    0.9893<-15.96°  1.015<-7.599°
           Bus_55                   58             8.6771e-11    0.955<-17.87°   0.9714<-17.33°  0.967<-16.97°   0.998<-13.25°   0.9991<-12.76°  0.99<-15.54°    0.9893<-15.99°  1.015<-7.635°
           Bus_56                   58             7.4491e-11    0.955<-17.51°   0.9714<-16.97°  0.967<-16.61°   0.998<-12.88°   0.9991<-12.4°   0.99<-15.18°    0.9893<-15.63°  1.015<-7.272°
```

```
    Generator Removed At         V9                V10             V11             V12             V13             V14             V15             V16             V17             V18             V19             V20             V21             V22
    ____________________    _______________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________

           Bus_1            1.043<2.687°      1.05<10.27°     0.9847<-12.18°  0.99<-12.56°    0.9678<-13.86°  0.9834<-13.66°  0.97<-15.03°    0.9826<-13.33°  0.9909<-12.5°   0.973<-14.83°   0.962<-15.35°   0.9573<-14.64°  0.9583<-13.19°  0.9696<-10.78°
           Bus_4            1.043<1.687°      1.05<9.268°     0.9843<-13.53°  0.99<-14.13°    0.9675<-15.12°  0.9835<-15.07°  0.97<-16°       0.9826<-14.69°  0.991<-13.43°   0.973<-15.76°   0.962<-16.27°   0.9572<-15.51°  0.9581<-14.01°  0.9695<-11.56°
           Bus_6            1.043<2.705°      1.05<10.29°     0.9846<-12.25°  0.99<-12.69°    0.9677<-13.92°  0.9835<-13.76°  0.97<-15.07°    0.9826<-13.42°  0.9909<-12.52°  0.973<-14.86°   0.962<-15.38°   0.9573<-14.67°  0.9583<-13.21°  0.9696<-10.8°
           Bus_8            1.046<0.8178°     1.05<8.39°      0.9847<-14.73°  0.99<-15.28°    0.968<-16.22°   0.9836<-16.12°  0.97<-16.76°    0.9827<-15.71°  0.9914<-14.16°  0.973<-16.47°   0.962<-16.98°   0.9571<-16.18°  0.958<-14.66°   0.9693<-12.17°
           Bus_10           1.075<-49.69°     1.096<-49.79°   0.9847<-54.43°  0.99<-54.55°    0.9673<-54.22°  0.9827<-53.54°  0.97<-48.98°    0.9794<-52.8°   0.9874<-46.51°  0.973<-48.27°   0.962<-48.17°   0.9528<-46.03°  0.9516<-43.51°  0.9623<-39.88°
           Bus_12           1.043<-4.516°     1.05<3.065°     0.9735<-20.35°  0.9724<-20.97°  0.9593<-21.59°  0.9706<-21.48°  0.97<-21.17°    0.97<-20.98°    0.9902<-18.49°  0.973<-20.76°   0.962<-21.2°    0.9566<-20.2°   0.9573<-18.51°  0.9685<-15.85°
           Bus_15           1.043<4.295°      1.05<11.88°     0.9849<-10.8°   0.99<-11.3°     0.97<-11.96°    0.9856<-11.77°  0.9776<-11.4°   0.983<-11.59°   0.9924<-9.764°  0.973<-11.83°   0.962<-12.1°    0.958<-11.71°   0.9593<-10.48°  0.9707<-8.336°
           Bus_18           1.043<2.315°      1.05<9.896°     0.9846<-12.99°  0.99<-13.5°     0.9679<-14.31°  0.9836<-14.15°  0.97<-14.27°    0.9827<-13.71°  0.9916<-11.69°  0.9765<-12.91°  0.962<-14.14°   0.9577<-13.61°  0.9589<-12.28°  0.9702<-10.01°
           Bus_19           1.043<1.344°      1.05<8.925°     0.9846<-13.97°  0.99<-14.49°    0.9679<-15.28°  0.9836<-15.12°  0.97<-15.19°    0.9825<-14.76°  0.9909<-12.87°  0.973<-14.78°   0.9725<-15.02°  0.9658<-14.47°  0.9651<-13.13°  0.9743<-10.86°
           Bus_24           1.043<-0.9144°    1.05<6.666°     0.9846<-16.35°  0.99<-16.88°    0.9679<-17.74°  0.9836<-17.61°  0.97<-17.94°    0.9825<-17.17°  0.9909<-15.33°  0.973<-17.62°   0.962<-18.09°   0.958<-17.13°   0.9595<-15.49°  0.9718<-12.88°
           Bus_25           1.043<-13.55°     1.05<-5.971°    0.9846<-28.99°  0.99<-29.53°    0.9679<-30.35°  0.9836<-30.22°  0.97<-30.42°    0.9827<-29.92°  0.9914<-28.28°  0.973<-30.34°   0.962<-30.58°   0.9552<-30.53°  0.9544<-29.54°  0.9633<-27.64°
           Bus_26           1.043<-19.99°     1.05<-12.41°    0.9846<-35.28°  0.99<-35.8°     0.9679<-36.54°  0.9836<-36.38°  0.97<-36.31°    0.9832<-36.14°  0.9928<-34.4°   0.973<-36.26°   0.962<-36.34°   0.958<-36.09°   0.9593<-34.96°  0.9707<-32.93°
           Bus_27           1.043<2.567°      1.05<10.15°     0.9846<-12.83°  0.99<-13.35°    0.9679<-14.22°  0.9836<-14.08°  0.97<-14.4°     0.9824<-13.57°  0.9905<-11.57°  0.973<-13.99°   0.962<-14.58°   0.9566<-13.51°  0.9572<-11.78°  0.9685<-9.073°
           Bus_31           1.043<0.6883°     1.05<8.269°     0.9846<-14.72°  0.99<-15.24°    0.9679<-16.1°   0.9836<-15.96°  0.97<-16.27°    0.9825<-15.48°  0.9908<-13.53°  0.973<-15.9°    0.962<-16.45°   0.9569<-15.55°  0.9577<-13.94°  0.9691<-11.36°
           Bus_32           1.043<1.911°      1.05<9.492°     0.9846<-13.48°  0.99<-14°       0.9679<-14.86°  0.9836<-14.72°  0.97<-15.03°    0.9824<-14.23°  0.9906<-12.24°  0.973<-14.64°   0.962<-15.21°   0.9575<-14.18°  0.9587<-12.49°  0.9707<-9.813°
           Bus_34           1.043<1.318°      1.05<8.899°     0.9846<-14.1°   0.99<-14.63°    0.9679<-15.47°  0.9836<-15.33°  0.97<-15.59°    0.9826<-14.93°  0.9912<-13.11°  0.973<-15.32°   0.962<-15.73°   0.9574<-15.04°  0.9583<-13.59°  0.9697<-11.19°
           Bus_36           1.043<0.0002251°  1.05<7.581°     0.9846<-15.43°  0.99<-15.96°    0.9679<-16.81°  0.9836<-16.68°  0.97<-16.98°    0.9826<-16.26°  0.991<-14.44°   0.973<-16.69°   0.962<-17.13°   0.9572<-16.35°  0.9581<-14.83°  0.9694<-12.36°
           Bus_40           1.043<1.247°      1.05<8.827°     0.9846<-14.18°  0.99<-14.71°    0.9679<-15.55°  0.9836<-15.42°  0.97<-15.7°     0.9826<-15.01°  0.9911<-13.19°  0.973<-15.43°   0.962<-15.85°   0.9573<-15.15°  0.9583<-13.69°  0.9696<-11.27°
           Bus_42           1.043<1.639°      1.05<9.22°      0.9846<-13.79°  0.99<-14.32°    0.9679<-15.16°  0.9836<-15.03°  0.97<-15.31°    0.9826<-14.62°  0.9911<-12.81°  0.973<-15.04°   0.962<-15.47°   0.9574<-14.78°  0.9584<-13.33°  0.9697<-10.94°
           Bus_46           1.043<-1.304°     1.05<6.277°     0.9846<-16.75°  0.99<-17.28°    0.9679<-18.14°  0.9836<-18.01°  0.97<-18.34°    0.9826<-17.57°  0.9909<-15.75°  0.973<-18.03°   0.962<-18.5°    0.957<-17.64°   0.9578<-16.06°  0.9691<-13.52°
           Bus_49           1.043<-3.606°     1.05<3.975°     0.9846<-19.06°  0.99<-19.58°    0.9679<-20.45°  0.9836<-20.32°  0.97<-20.67°    0.9825<-19.87°  0.9908<-18.03°  0.973<-20.34°   0.962<-20.83°   0.9567<-19.84°  0.9573<-18.17°  0.9686<-15.53°
           Bus_54           1.043<-0.345°     1.05<7.236°     0.9846<-15.79°  0.99<-16.32°    0.9679<-17.18°  0.9836<-17.05°  0.97<-17.38°    0.9826<-16.62°  0.991<-14.8°    0.973<-17.08°   0.962<-17.54°   0.9571<-16.73°  0.9579<-15.18°  0.9692<-12.68°
           Bus_55           1.043<-0.3812°    1.05<7.2°       0.9846<-15.83°  0.99<-16.36°    0.9679<-17.22°  0.9836<-17.08°  0.97<-17.41°    0.9826<-16.66°  0.991<-14.84°   0.973<-17.11°   0.962<-17.58°   0.9571<-16.76°  0.9579<-15.22°  0.9692<-12.71°
           Bus_56           1.043<-0.01821°   1.05<7.563°     0.9846<-15.46°  0.99<-15.99°    0.9679<-16.85°  0.9836<-16.72°  0.97<-17.05°    0.9826<-16.29°  0.991<-14.48°   0.973<-16.75°   0.962<-17.21°   0.9571<-16.42°  0.958<-14.89°   0.9693<-12.4°
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    Generator Removed At        V23              V24             V25              V26             V27             V28             V29             V30             V31             V32             V33             V34             V35             V36
    ____________________    _____________   _____________   _______________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________

           Bus_1            0.9997<-6.088°  0.992<-6.624°   1.05<1.122°       1.015<3.085°    0.968<-11.37°   0.9616<-13.05°  0.9632<-13.98°  1.009<-7.453°   0.967<-13.85°   0.963<-11.91°   0.9689<-16.11°  0.984<-16.03°   0.9797<-16.47°  0.98<-16.48°
           Bus_4            0.9996<-6.802°  0.992<-7.231°   1.05<0.34°        1.015<2.28°     0.968<-12.18°   0.9616<-13.87°  0.9632<-14.83°  1.009<-8.315°   0.967<-14.7°    0.963<-12.73°   0.9689<-16.94°  0.984<-16.68°   0.9797<-17.13°  0.98<-17.14°
           Bus_6            0.9997<-6.104°  0.992<-6.637°   1.05<1.107°       1.015<3.072°    0.968<-11.39°   0.9616<-13.07°  0.9632<-14.01°  1.009<-7.463°   0.967<-13.87°   0.963<-11.93°   0.9689<-16.14°  0.984<-16.04°   0.9797<-16.49°  0.98<-16.5°
           Bus_8            0.9996<-7.36°   0.992<-7.705°   1.05<-0.2737°     1.015<1.645°    0.968<-12.82°   0.9616<-14.52°  0.9632<-15.48°  1.01<-8.992°    0.967<-15.36°   0.963<-13.36°   0.9689<-17.57°  0.984<-17.19°   0.9797<-17.63°  0.98<-17.64°
           Bus_10           0.9963<-33.28°  0.992<-29.9°    1.05<-29.03°      1.015<-28.31°   0.968<-42.02°   0.9615<-44.1°   0.9633<-45.49°  0.997<-41.89°   0.967<-45.51°   0.963<-42.48°   0.9648<-45.98°  0.984<-41.39°   0.979<-41.81°   0.98<-41.83°
           Bus_12           0.9993<-10.76°  0.992<-10.6°    1.05<-4.038°      1.015<-2.264°   0.968<-16.68°   0.9616<-18.44°  0.9632<-19.47°  1.008<-13.25°   0.967<-19.37°   0.963<-17.22°   0.9688<-21.39°  0.984<-20.35°   0.9797<-20.79°  0.98<-20.8°
           Bus_15           1<-4.06°        0.992<-4.899°   1.05<3.23°        1.015<5.187°    0.968<-9.064°   0.9616<-10.68°  0.9632<-11.55°  1.01<-5.36°     0.967<-11.39°   0.963<-9.582°   0.9728<-13.26°  0.984<-14.04°   0.9798<-14.5°   0.98<-14.51°
           Bus_18           0.9998<-5.555°  0.992<-6.17°    1.05<1.605°       1.015<3.518°    0.968<-10.76°   0.9616<-12.41°  0.9632<-13.31°  1.01<-7.134°    0.967<-13.16°   0.963<-11.28°   0.9689<-15.5°   0.984<-15.57°   0.9797<-16.02°  0.98<-16.03°
           Bus_19           1<-6.371°       0.992<-6.855°   1.05<0.7151°      1.015<2.609°    0.968<-11.72°   0.9616<-13.4°   0.9632<-14.34°  1.009<-8.091°   0.967<-14.2°    0.963<-12.25°   0.9689<-16.3°   0.984<-16.22°   0.9797<-16.67°  0.98<-16.68°
           Bus_24           1.004<-7.888°   1.002<-7.901°   1.05<-1.07°       1.015<0.7219°   0.968<-13.63°   0.9616<-15.38°  0.9632<-16.39°  1.008<-10.22°   0.967<-16.28°   0.963<-14.16°   0.9689<-18.61°  0.984<-18.07°   0.9797<-18.52°  0.98<-18.53°
           Bus_25           0.9878<-23.73°  0.992<-21.78°   1.008<-20.35°     1.015<-16.47°   0.968<-30.25°   0.9615<-31.39°  0.963<-31.74°   1.009<-22.86°   0.967<-31.4°    0.963<-29.97°   0.9682<-29.59°  0.984<-27.39°   0.9796<-27.82°  0.98<-27.84°
           Bus_26           0.9994<-28.83°  0.992<-26.02°   1.05<-26.47°      1.053<-27.43°   0.968<-35.65°   0.9615<-36.88°  0.9631<-37.32°  1.017<-29.47°   0.967<-37.01°   0.963<-35.38°   0.9677<-34.9°   0.984<-32.07°   0.9795<-32.5°   0.98<-32.51°
           Bus_27           0.9996<-3.911°  0.992<-4.782°   1.05<3.327°       1.015<4.834°    0.978<-7.031°   0.9675<-9.294°  0.9649<-10.91°  1.008<-6.785°   0.967<-11.01°   0.963<-8.628°   0.9689<-15.54°  0.984<-15.52°   0.9797<-15.97°  0.98<-15.98°
           Bus_31           0.9997<-6.405°  0.992<-6.895°   1.05<0.6203°      1.015<2.375°    0.968<-11.3°    0.9621<-12.68°  0.9643<-13.27°  1.009<-8.656°   0.9684<-13.02°  0.963<-11.85°   0.9689<-17.18°  0.984<-16.9°    0.9797<-17.34°  0.98<-17.35°
           Bus_32           1.003<-4.722°   0.992<-5.428°   1.05<2.279°       1.015<3.902°    0.968<-9.12°    0.9616<-10.95°  0.9632<-12.05°  1.008<-7.443°   0.967<-11.97°   0.9773<-9.456°  0.9689<-16.1°   0.984<-16°      0.9797<-16.44°  0.98<-16.45°
           Bus_34           0.9997<-6.518°  0.992<-6.986°   1.05<0.6309°      1.015<2.571°    0.968<-11.88°   0.9616<-13.57°  0.9632<-14.52°  1.01<-8.017°    0.967<-14.39°   0.963<-12.43°   0.9697<-15.9°   0.9865<-14.72°  0.98<-15.23°    0.98<-15.21°
           Bus_36           0.9996<-7.575°  0.992<-7.886°   1.05<-0.5291°     1.015<1.37°     0.968<-13.07°   0.9616<-14.77°  0.9632<-15.74°  1.009<-9.319°   0.967<-15.62°   0.963<-13.61°   0.969<-17.41°   0.984<-16.53°   0.9816<-16.73°  0.9822<-16.67°
           Bus_40           0.9996<-6.581°  0.992<-7.037°   1.05<0.5662°      1.015<2.508°    0.968<-11.95°   0.9616<-13.64°  0.9632<-14.6°   1.009<-8.08°    0.967<-14.47°   0.963<-12.5°    0.9691<-15.99°  0.984<-15.07°   0.9798<-15.49°  0.98<-15.51°
           Bus_42           0.9997<-6.266°  0.992<-6.765°   1.05<0.9133°      1.015<2.869°    0.968<-11.6°    0.9616<-13.29°  0.9632<-14.24°  1.009<-7.686°   0.967<-14.11°   0.963<-12.15°   0.9689<-15.59°  0.984<-14.65°   0.9797<-15.07°  0.98<-15.09°
           Bus_46           0.9995<-8.618°  0.992<-8.774°   1.05<-1.676°      1.015<0.1816°   0.968<-14.24°   0.9616<-15.96°  0.9632<-16.95°  1.009<-10.61°   0.967<-16.84°   0.963<-14.78°   0.9689<-18.92°  0.984<-18.28°   0.9797<-18.73°  0.98<-18.74°
           Bus_49           0.9993<-10.47°  0.992<-10.37°   1.05<-3.71°       1.015<-1.93°    0.968<-16.31°   0.9616<-18.06°  0.9632<-19.07°  1.008<-12.91°   0.967<-18.97°   0.963<-16.85°   0.9688<-21.41°  0.984<-20.97°   0.9797<-21.4°   0.98<-21.42°
           Bus_54           0.9995<-7.848°  0.992<-8.11°    1.05<-0.8281°     1.015<1.062°    0.968<-13.38°   0.9616<-15.09°  0.9632<-16.07°  1.009<-9.649°   0.967<-15.95°   0.963<-13.93°   0.9689<-17.91°  0.984<-17.22°   0.9797<-17.66°  0.98<-17.67°
           Bus_55           0.9995<-7.877°  0.992<-8.135°   1.05<-0.86°       1.015<1.029°    0.968<-13.41°   0.9616<-15.13°  0.9632<-16.11°  1.009<-9.685°   0.967<-15.98°   0.963<-13.96°   0.9689<-17.95°  0.984<-17.26°   0.9797<-17.71°  0.98<-17.72°
           Bus_56           0.9996<-7.585°  0.992<-7.884°   1.05<-0.5392°     1.015<1.363°    0.968<-13.09°   0.9616<-14.8°   0.9632<-15.77°  1.009<-9.322°   0.967<-15.65°   0.963<-13.64°   0.9689<-17.57°  0.984<-16.85°   0.9797<-17.3°   0.98<-17.31°
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    Generator Removed At        V37             V38              V39             V40              V41             V42              V43             V44             V45             V46             V47             V48             V49             V50
    ____________________    _____________   ______________   _____________   ______________   _____________   ______________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   ______________

           Bus_1            0.9864<-15.51°  1.002<-10.21°    0.9682<-19.22°  0.97<-20.48°     0.9669<-21.04°  0.985<-19.74°    0.9777<-16.52°  0.9854<-14.69°  0.9872<-13.1°   1.005<-10.48°   1.017<-8.412°   1.021<-9.08°    1.025<-8.089°   1.001<-10.14°
           Bus_4            0.9864<-16.16°  1.002<-10.86°    0.9683<-19.81°  0.97<-21.03°     0.9669<-21.56°  0.985<-20.18°    0.9775<-17.06°  0.9852<-15.06°  0.987<-13.41°   1.005<-10.74°   1.017<-8.629°   1.021<-9.328°   1.025<-8.333°   1.001<-10.38°
           Bus_6            0.9864<-15.52°  1.002<-10.22°    0.9682<-19.23°  0.97<-20.49°     0.9669<-21.05°  0.985<-19.75°    0.9777<-16.53°  0.9854<-14.7°   0.9872<-13.11°  1.005<-10.48°   1.017<-8.416°   1.021<-9.085°   1.025<-8.093°   1.001<-10.14°
           Bus_8            0.9865<-16.67°  1.002<-11.36°    0.9683<-20.26°  0.97<-21.45°     0.9668<-21.95°  0.985<-20.51°    0.9774<-17.48°  0.985<-15.35°   0.9868<-13.64°  1.005<-10.94°   1.017<-8.796°   1.021<-9.519°   1.025<-8.523°   1.001<-10.57°
           Bus_10           0.9822<-40.77°  0.9781<-35.64°   0.9675<-42.05°  0.97<-41.9°      0.9661<-41.32°  0.985<-36.93°    0.9652<-37.49°  0.9688<-29.06°  0.9751<-25.05°  1.005<-20.63°   1.012<-16.92°   1.021<-18.8°    1.025<-17.69°   1.001<-19.64°
           Bus_12           0.9862<-19.82°  1<-14.51°        0.9684<-23.1°   0.97<-24.1°      0.9668<-24.46°  0.985<-22.63°    0.9766<-20.08°  0.9837<-17.13°  0.9858<-15.13°  1.005<-12.19°   1.017<-9.846°   1.021<-10.72°   1.025<-9.71°    1.001<-11.75°
           Bus_15           0.9867<-13.55°  1.003<-8.454°    0.9682<-17.47°  0.97<-18.85°     0.9669<-19.49°  0.985<-18.45°    0.978<-14.9°    0.9861<-13.6°   0.9878<-12.2°   1.005<-9.729°   1.018<-7.788°   1.021<-8.367°   1.025<-7.385°   1.001<-9.443°
           Bus_18           0.9865<-15.07°  1.003<-9.871°    0.9682<-18.83°  0.97<-20.12°     0.9669<-20.69°  0.985<-19.45°    0.9778<-16.15°  0.9856<-14.45°  0.9873<-12.9°   1.005<-10.32°   1.017<-8.278°   1.021<-8.927°   1.025<-7.939°   1.001<-9.99°
           Bus_19           0.9864<-15.73°  1.002<-10.55°    0.9683<-19.42°  0.97<-20.67°     0.9669<-21.21°  0.985<-19.89°    0.9776<-16.69°  0.9853<-14.82°  0.9871<-13.21°  1.005<-10.58°   1.017<-8.499°   1.021<-9.18°    1.025<-8.188°   1.001<-10.24°
           Bus_24           0.9863<-17.55°  1.001<-12.25°    0.9683<-21.06°  0.97<-22.19°     0.9668<-22.66°  0.985<-21.1°     0.9772<-18.21°  0.9846<-15.84°  0.9865<-14.06°  1.005<-11.29°   1.017<-9.089°   1.021<-9.854°   1.025<-8.854°   1.001<-10.9°
           Bus_25           0.9856<-26.83°  0.9968<-21.58°   0.9684<-29.42°  0.97<-30.03°     0.9666<-30.07°  0.985<-27.38°    0.974<-25.9°    0.9799<-21.13°  0.9829<-18.47°  1.005<-15.03°   1.016<-12.23°   1.021<-13.44°   1.025<-12.4°    1.001<-14.41°
           Bus_26           0.9853<-31.5°   0.9957<-26.38°   0.9685<-33.64°  0.97<-33.99°     0.9665<-33.83°  0.985<-30.57°    0.9716<-29.77°  0.9768<-23.8°   0.9806<-20.7°   1.005<-16.93°   1.015<-13.82°   1.021<-15.26°   1.025<-14.2°    1.001<-16.2°
           Bus_27           0.9864<-15.01°  1.002<-9.715°    0.9682<-18.77°  0.97<-20.06°     0.9669<-20.64°  0.985<-19.4°     0.9778<-16.11°  0.9856<-14.4°   0.9873<-12.86°  1.005<-10.28°   1.017<-8.241°   1.021<-8.884°   1.025<-7.895°   1.001<-9.946°
           Bus_31           0.9864<-16.38°  1.002<-11.09°    0.9683<-20°     0.97<-21.21°     0.9669<-21.72°  0.985<-20.32°    0.9775<-17.24°  0.9851<-15.18°  0.9869<-13.51°  1.005<-10.82°   1.017<-8.7°     1.021<-9.409°   1.025<-8.414°   1.001<-10.46°
           Bus_32           0.9864<-15.48°  1.002<-10.19°    0.9682<-19.2°   0.97<-20.46°     0.9669<-21.01°  0.985<-19.72°    0.9777<-16.5°   0.9854<-14.67°  0.9872<-13.08°  1.005<-10.46°   1.017<-8.4°     1.021<-9.066°   1.025<-8.075°   1.001<-10.12°
           Bus_34           0.9881<-14.44°  1.005<-9.865°    0.9688<-18.25°  0.97<-19.58°     0.9669<-20.19°  0.985<-19.06°    0.9798<-15.49°  0.9867<-14.08°  0.988<-12.64°   1.005<-10.12°   1.017<-8.134°   1.021<-8.766°   1.025<-7.787°   1.001<-9.847°
           Bus_36           0.9866<-16.09°  1.003<-11.18°    0.9683<-19.75°  0.97<-20.98°     0.9669<-21.51°  0.985<-20.16°    0.9776<-16.96°  0.9853<-15.03°  0.9871<-13.41°  1.005<-10.75°   1.017<-8.653°   1.021<-9.357°   1.025<-8.367°   1.001<-10.42°
           Bus_40           0.9868<-14.51°  1.004<-9.887°    0.973<-16.56°   0.9761<-16.86°   0.9715<-17.67°  0.985<-17.1°     0.9777<-15.63°  0.9855<-13.89°  0.9873<-12.33°  1.005<-9.756°   1.018<-7.761°   1.021<-8.325°   1.025<-7.325°   1.001<-9.41°
           Bus_42           0.9863<-14.08°  1.003<-9.462°    0.9689<-16.12°  0.97<-16.4°      0.9688<-16.24°  0.9938<-13.02°   0.9775<-15.03°  0.9851<-13.03°  0.9869<-11.38°  1.005<-8.776°   1.018<-6.829°   1.021<-7.236°   1.025<-6.207°   1.001<-8.345°
           Bus_46           0.9863<-17.76°  1.001<-12.49°    0.9683<-21.21°  0.97<-22.32°     0.9668<-22.75°  0.985<-21.14°    0.9796<-18.27°  0.9905<-15.71°  0.9937<-13.87°  1.019<-11.01°   1.021<-8.941°   1.024<-9.702°   1.025<-8.726°   1.001<-10.78°
           Bus_49           0.9863<-20.43°  1.001<-14.91°    0.9682<-24.21°  0.97<-25.5°      0.9669<-26.09°  0.985<-24.87°    0.9749<-21.46°  0.9786<-19.61°  0.9792<-18°     1.005<-15.31°   1.003<-12.59°   1.004<-13.9°    1.004<-12.87°   0.9853<-14.86°
           Bus_54           0.9863<-16.7°   1.001<-11.46°    0.9684<-20.06°  0.97<-21.11°     0.9668<-21.51°  0.985<-19.78°    0.9769<-17.13°  0.984<-14.44°   0.986<-12.53°   1.005<-9.737°   1.018<-7.628°   1.021<-8.149°   1.025<-7.107°   1.002<-8.787°
           Bus_55           0.9863<-16.74°  1.001<-11.5°     0.9684<-20.11°  0.97<-21.16°     0.9668<-21.57°  0.985<-19.84°    0.9769<-17.18°  0.9841<-14.51°  0.9861<-12.61°  1.005<-9.814°   1.018<-7.7°     1.021<-8.233°   1.025<-7.193°   1.002<-8.863°
           Bus_56           0.9863<-16.33°  1.001<-11.11°    0.9684<-19.67°  0.97<-20.7°      0.9668<-21.09°  0.985<-19.32°    0.9768<-16.72°  0.9839<-13.97°  0.9859<-12.04°  1.005<-9.256°   1.018<-7.179°   1.021<-7.625°   1.025<-6.573°   1.002<-8.109°
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    Generator Removed At        V51             V52             V53              V54              V55              V56             V57             V58             V59             V60             V61             V62             V63             V64
    ____________________    _____________   _____________   ______________   ______________   ______________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________

           Bus_1            0.9668<-12.77°  0.9568<-13.73°  0.946<-14.71°    0.955<-13.81°    0.952<-14.1°     0.954<-13.91°   0.9706<-12.69°  0.959<-13.55°   0.985<-9.747°   0.9932<-5.963°  0.995<-5.072°   0.998<-5.684°   0.9926<-6.335°  0.9983<-4.605°
           Bus_4            0.9669<-13.01°  0.9568<-13.97°  0.946<-14.95°    0.955<-14.04°    0.952<-14.34°    0.954<-14.15°   0.9706<-12.93°  0.959<-13.79°   0.985<-9.975°   0.9932<-6.189°  0.995<-5.298°   0.998<-5.91°    0.9926<-6.56°   0.9983<-4.828°
           Bus_6            0.9668<-12.78°  0.9568<-13.73°  0.946<-14.72°    0.955<-13.81°    0.952<-14.11°    0.954<-13.92°   0.9706<-12.7°   0.959<-13.56°   0.985<-9.751°   0.9932<-5.967°  0.995<-5.077°   0.998<-5.688°   0.9926<-6.339°  0.9983<-4.609°
           Bus_8            0.9669<-13.2°   0.9568<-14.15°  0.946<-15.13°    0.955<-14.23°    0.952<-14.52°    0.954<-14.33°   0.9706<-13.12°  0.959<-13.97°   0.985<-10.15°   0.9932<-6.364°  0.995<-5.472°   0.998<-6.086°   0.9926<-6.735°  0.9983<-5.002°
           Bus_10           0.9671<-22.16°  0.957<-23.08°   0.9461<-23.98°   0.955<-23.02°    0.952<-23.28°    0.954<-23.11°   0.9707<-22.02°  0.9592<-22.86°  0.985<-18.61°   0.9931<-14.72°  0.995<-13.81°   0.998<-14.46°   0.9923<-15.06°  0.9981<-13.26°
           Bus_12           0.9669<-14.36°  0.9568<-15.31°  0.946<-16.28°    0.955<-15.37°    0.952<-15.66°    0.954<-15.47°   0.9706<-14.27°  0.959<-15.13°   0.985<-11.26°   0.9932<-7.459°  0.995<-6.566°   0.998<-7.184°   0.9925<-7.827°  0.9983<-6.086°
           Bus_15           0.9668<-12.09°  0.9568<-13.04°  0.946<-14.04°    0.955<-13.14°    0.952<-13.43°    0.954<-13.24°   0.9706<-12.01°  0.959<-12.87°   0.985<-9.104°   0.9932<-5.33°   0.995<-4.44°    0.998<-5.049°   0.9926<-5.704°  0.9984<-3.98°
           Bus_18           0.9668<-12.63°  0.9568<-13.58°  0.946<-14.57°    0.955<-13.67°    0.952<-13.96°    0.954<-13.77°   0.9706<-12.55°  0.959<-13.41°   0.985<-9.614°   0.9932<-5.833°  0.995<-4.943°   0.998<-5.553°   0.9926<-6.205°  0.9984<-4.477°
           Bus_19           0.9668<-12.87°  0.9568<-13.83°  0.946<-14.81°    0.955<-13.91°    0.952<-14.2°     0.954<-14.01°   0.9706<-12.79°  0.959<-13.65°   0.985<-9.849°   0.9932<-6.066°  0.995<-5.176°   0.998<-5.787°   0.9926<-6.438°  0.9983<-4.709°
           Bus_24           0.9669<-13.52°  0.9568<-14.48°  0.946<-15.45°    0.955<-14.55°    0.952<-14.84°    0.954<-14.65°   0.9706<-13.44°  0.959<-14.3°    0.985<-10.46°   0.9932<-6.669°  0.995<-5.777°   0.998<-6.392°   0.9926<-7.039°  0.9983<-5.304°
           Bus_25           0.9669<-17°     0.9569<-17.94°  0.946<-18.9°     0.955<-17.97°    0.952<-18.25°    0.954<-18.07°   0.9706<-16.9°   0.9591<-17.75°  0.985<-13.77°   0.9932<-9.944°  0.995<-9.047°   0.998<-9.675°   0.9925<-10.31°  0.9983<-8.548°
           Bus_26           0.967<-18.76°   0.9569<-19.7°   0.946<-20.64°    0.955<-19.7°     0.952<-19.98°    0.954<-19.8°    0.9706<-18.65°  0.9591<-19.5°   0.985<-15.45°   0.9932<-11.6°   0.995<-10.7°    0.998<-11.34°   0.9924<-11.96°  0.9982<-10.19°
           Bus_27           0.9668<-12.58°  0.9568<-13.54°  0.946<-14.52°    0.955<-13.62°    0.952<-13.91°    0.954<-13.72°   0.9706<-12.5°   0.959<-13.36°   0.985<-9.563°   0.9932<-5.781°  0.995<-4.891°   0.998<-5.502°   0.9926<-6.153°  0.9983<-4.424°
           Bus_31           0.9669<-13.09°  0.9568<-14.05°  0.946<-15.03°    0.955<-14.12°    0.952<-14.41°    0.954<-14.23°   0.9706<-13.01°  0.959<-13.87°   0.985<-10.05°   0.9932<-6.264°  0.995<-5.373°   0.998<-5.986°   0.9926<-6.635°  0.9983<-4.903°
           Bus_32           0.9668<-12.76°  0.9568<-13.71°  0.946<-14.7°     0.955<-13.79°    0.952<-14.09°    0.954<-13.9°    0.9706<-12.68°  0.959<-13.54°   0.985<-9.732°   0.9932<-5.948°  0.995<-5.058°   0.998<-5.669°   0.9926<-6.32°   0.9983<-4.59°
           Bus_34           0.9668<-12.49°  0.9568<-13.45°  0.946<-14.45°    0.955<-13.55°    0.952<-13.85°    0.954<-13.66°   0.9705<-12.42°  0.959<-13.28°   0.985<-9.528°   0.9932<-5.757°  0.995<-4.868°   0.998<-5.476°   0.9926<-6.132°  0.9984<-4.41°
           Bus_36           0.9668<-13.05°  0.9568<-14.01°  0.946<-15°       0.955<-14.09°    0.952<-14.39°    0.954<-14.2°    0.9706<-12.98°  0.959<-13.84°   0.985<-10.04°   0.9932<-6.257°  0.995<-5.366°   0.998<-5.977°   0.9926<-6.629°  0.9984<-4.9°
           Bus_40           0.9668<-12.09°  0.9567<-13.06°  0.9459<-14.07°   0.955<-13.19°    0.952<-13.5°     0.954<-13.3°    0.9705<-12.03°  0.959<-12.9°    0.985<-9.261°   0.9932<-5.521°  0.995<-4.636°   0.998<-5.233°   0.9927<-5.902°  0.9984<-4.2°
           Bus_42           0.9666<-11.09°  0.9565<-12.08°  0.9458<-13.14°   0.955<-12.29°    0.952<-12.62°    0.954<-12.41°   0.9704<-11.07°  0.9589<-11.95°  0.985<-8.554°   0.9932<-4.876°  0.995<-4.001°   0.998<-4.575°   0.9929<-5.272°  0.9986<-3.61°
           Bus_46           0.9668<-13.42°  0.9568<-14.38°  0.946<-15.36°    0.955<-14.46°    0.952<-14.76°    0.954<-14.57°   0.9706<-13.34°  0.959<-14.2°    0.985<-10.42°   0.9932<-6.641°  0.995<-5.751°   0.998<-6.361°   0.9926<-7.014°  0.9984<-5.287°
           Bus_49           0.9575<-17.4°   0.949<-18.33°   0.9426<-19.2°    0.955<-18.2°     0.952<-18.43°    0.954<-18.28°   0.964<-17.23°   0.9536<-18.07°  0.985<-13.35°   0.9931<-9.293°  0.995<-8.369°   0.998<-9.049°   0.9919<-9.63°   0.9978<-7.738°
           Bus_54           0.9685<-10.92°  0.9591<-11.73°  0.9493<-12.31°   0.9588<-11.11°   0.952<-11.56°    0.954<-11.34°   0.971<-10.65°   0.96<-11.4°     0.985<-8.273°   0.9932<-4.989°  0.995<-4.128°   0.998<-4.777°   0.9934<-5.291°  0.9989<-3.782°
           Bus_55           0.9677<-11.02°  0.9577<-11.86°  0.9464<-12.52°   0.955<-11.38°    0.9565<-11.22°   0.954<-11.38°   0.9711<-10.7°   0.9596<-11.47°  0.985<-8.286°   0.9932<-5.013°  0.995<-4.152°   0.998<-4.806°   0.9934<-5.311°  0.9989<-3.806°
           Bus_56           0.9691<-10.1°   0.9589<-10.9°   0.947<-11.46°    0.955<-10.24°    0.952<-10.45°    0.9568<-10.18°  0.9731<-9.695°  0.9615<-10.43°  0.985<-7.562°   0.9932<-4.441°  0.995<-3.59°    0.998<-4.252°   0.9936<-4.72°   0.9991<-3.283°
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    Generator Removed At        V65              V66              V67             V68             V69          V70              V71             V72             V73             V74             V75             V76             V77             V78             V79
    ____________________    ______________   ______________   _____________   _____________   _________   ______________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________

           Bus_1            1.005<-1.477°    1.05<-1.609°     1.02<-4.259°    1.012<-1.939°   1.035<0°    0.984<-6.767°    0.9869<-7.035°  0.98<-7.411°    0.991<-7.247°   0.958<-7.926°   0.9675<-6.733°  0.943<-7.899°   1.006<-3.001°   1.003<-3.3°     1.009<-2.993°
           Bus_4            1.005<-1.696°    1.05<-1.839°     1.02<-4.487°    1.012<-2.082°   1.035<0°    0.984<-6.935°    0.9869<-7.242°  0.98<-7.81°     0.991<-7.453°   0.958<-8.041°   0.9674<-6.831°  0.943<-7.993°   1.006<-3.088°   1.003<-3.389°   1.009<-3.086°
           Bus_6            1.005<-1.481°    1.05<-1.613°     1.02<-4.263°    1.012<-1.942°   1.035<0°    0.984<-6.77°     0.9869<-7.04°   0.98<-7.42°     0.991<-7.251°   0.958<-7.929°   0.9675<-6.735°  0.943<-7.901°   1.006<-3.002°   1.003<-3.302°   1.009<-2.995°
           Bus_8            1.005<-1.866°    1.05<-2.017°     1.02<-4.663°    1.012<-2.193°   1.035<0°    0.984<-7.067°    0.9869<-7.403°  0.98<-8.121°    0.991<-7.614°   0.958<-8.131°   0.9674<-6.907°  0.943<-8.066°   1.006<-3.155°   1.003<-3.459°   1.009<-3.158°
           Bus_10           1.005<-9.936°    1.05<-10.55°     1.02<-13.12°    1.012<-7.484°   1.035<0°    0.984<-13.37°    0.9857<-15.11°  0.98<-22.91°    0.991<-15.33°   0.958<-12.47°   0.9653<-10.58°  0.943<-11.59°   1.006<-6.398°   1.003<-6.776°   1.009<-6.619°
           Bus_12           1.005<-2.929°    1.05<-3.132°     1.02<-5.771°    1.012<-2.889°   1.035<0°    0.984<-7.876°    0.9868<-8.393°  0.98<-10.03°    0.991<-8.605°   0.958<-8.686°   0.9672<-7.379°  0.943<-8.519°   1.006<-3.577°   1.003<-3.89°    1.009<-3.609°
           Bus_15           1.005<-0.8681°   1.05<-0.9606°    1.02<-3.616°    1.012<-1.541°   1.035<0°    0.984<-6.29°     0.9869<-6.451°  0.98<-6.28°     0.991<-6.662°   0.958<-7.601°   0.9676<-6.457°  0.943<-7.636°   1.006<-2.758°   1.003<-3.052°   1.009<-2.734°
           Bus_18           1.005<-1.354°    1.05<-1.475°     1.02<-4.126°    1.012<-1.858°   1.035<0°    0.984<-6.643°    0.9869<-6.883°  0.98<-7.114°    0.991<-7.094°   0.958<-7.844°   0.9675<-6.664°  0.943<-7.837°   1.006<-2.948°   1.003<-3.247°   1.009<-2.937°
           Bus_19           1.005<-1.581°    1.05<-1.712°     1.02<-4.361°    1.012<-2.007°   1.035<0°    0.984<-6.832°    0.9869<-7.115°  0.98<-7.563°    0.991<-7.326°   0.958<-7.972°   0.9675<-6.773°  0.943<-7.939°   1.006<-3.04°    1.003<-3.341°   1.009<-3.036°
           Bus_24           1.005<-2.162°    1.05<-2.328°     1.02<-4.972°    1.012<-2.384°   1.035<0°    0.984<-7.117°    0.9869<-7.453°  0.98<-8.173°    0.991<-7.664°   0.958<-8.181°   0.9674<-6.956°  0.943<-8.134°   1.006<-3.249°   1.003<-3.556°   1.009<-3.262°
           Bus_25           1.005<-5.342°    1.05<-5.662°     1.02<-8.283°    1.012<-4.489°   1.035<0°    0.984<-10.95°    0.9863<-12.18°  0.98<-17.42°    0.991<-12.39°   0.958<-10.69°   0.9663<-9.031°  0.943<-9.965°   1.006<-4.704°   1.003<-5.034°   1.009<-4.786°
           Bus_26           1.005<-6.948°    1.05<-7.351°     1.02<-9.959°    1.012<-5.542°   1.035<0°    0.984<-12.16°    0.9861<-13.66°  0.98<-20.26°    0.991<-13.88°   0.958<-11.54°   0.9658<-9.747°  0.943<-10.65°   1.006<-5.345°   1.003<-5.69°    1.009<-5.471°
           Bus_27           1.005<-1.299°    1.05<-1.425°     1.02<-4.075°    1.012<-1.817°   1.035<0°    0.984<-6.283°    0.9869<-6.435°  0.98<-6.216°    0.991<-6.646°   0.958<-7.626°   0.9676<-6.492°  0.943<-7.708°   1.006<-2.884°   1.003<-3.183°   1.009<-2.876°
           Bus_31           1.005<-1.769°    1.05<-1.915°     1.02<-4.562°    1.012<-2.128°   1.035<0°    0.984<-6.853°    0.9869<-7.137°  0.98<-7.594°    0.991<-7.349°   0.958<-7.997°   0.9675<-6.799°  0.943<-7.978°   1.006<-3.098°   1.003<-3.401°   1.009<-3.1°
           Bus_32           1.005<-1.462°    1.05<-1.595°     1.02<-4.244°    1.012<-1.924°   1.035<0°    0.984<-6.458°    0.9869<-6.651°  0.98<-6.638°    0.991<-6.862°   0.958<-7.741°   0.9676<-6.588°  0.943<-7.794°   1.006<-2.955°   1.003<-3.256°   1.009<-2.951°
           Bus_34           1.005<-1.305°    1.05<-1.382°     1.02<-4.04°     1.012<-1.83°    1.035<0°    0.984<-6.85°     0.9869<-7.143°  0.98<-7.641°    0.991<-7.354°   0.958<-7.965°   0.9675<-6.757°  0.943<-7.897°   1.006<-2.961°   1.003<-3.258°   1.009<-2.946°
           Bus_36           1.005<-1.776°    1.05<-1.899°     1.02<-4.55°     1.012<-2.136°   1.035<0°    0.984<-7.109°    0.9869<-7.457°  0.98<-8.236°    0.991<-7.668°   0.958<-8.15°    0.9674<-6.919°  0.943<-8.064°   1.006<-3.134°   1.003<-3.436°   1.009<-3.133°
           Bus_40           1.005<-1.147°    1.05<-1.097°     1.02<-3.774°    1.012<-1.729°   1.035<0°    0.984<-6.855°    0.9869<-7.152°  0.98<-7.67°     0.991<-7.363°   0.958<-7.957°   0.9675<-6.745°  0.943<-7.871°   1.006<-2.916°   1.003<-3.211°   1.009<-2.895°
           Bus_42           1.005<-0.6674°   1.05<-0.3493°    1.02<-3.067°    1.012<-1.42°    1.035<0°    0.984<-6.759°    0.9869<-7.04°   0.98<-7.481°    0.991<-7.252°   0.958<-7.867°   0.9675<-6.659°  0.943<-7.757°   1.006<-2.762°   1.003<-3.051°   1.009<-2.724°
           Bus_46           1.005<-2.169°    1.05<-2.278°     1.02<-4.931°    1.012<-2.392°   1.035<0°    0.984<-7.36°     0.9868<-7.763°  0.98<-8.822°    0.991<-7.975°   0.958<-8.327°   0.9673<-7.071°  0.943<-8.216°   1.006<-3.284°   1.003<-3.589°   1.009<-3.294°
           Bus_49           1.005<-4.185°    1.05<-5.226°     1.02<-7.761°    1.012<-3.695°   1.035<0°    0.984<-7.884°    0.9868<-8.38°   0.98<-9.908°    0.991<-8.592°   0.958<-8.775°   0.9672<-7.492°  0.943<-8.74°    1.006<-3.948°   1.003<-4.277°   1.009<-4.026°
           Bus_54           1.005<-1.122°    1.05<-0.9334°    1.02<-3.478°    1.012<-1.717°   1.035<0°    0.984<-7.131°    0.9869<-7.496°  0.98<-8.364°    0.991<-7.708°   0.958<-8.12°    0.9674<-6.872°  0.943<-7.959°   1.006<-2.945°   1.003<-3.239°   1.009<-2.92°
           Bus_55           1.005<-1.15°     1.05<-0.9833°    1.02<-3.518°    1.012<-1.735°   1.035<0°    0.984<-7.139°    0.9869<-7.506°  0.98<-8.381°    0.991<-7.717°   0.958<-8.126°   0.9674<-6.878°  0.943<-7.966°   1.006<-2.954°   1.003<-3.248°   1.009<-2.93°
           Bus_56           1.005<-0.7745°   1.05<-0.4883°    1.02<-2.997°    1.012<-1.493°   1.035...
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    Generator Removed At        V80             V81             V82             V83              V84              V85              V86              V87              V88             V89             V90              V91              V92             V93
    ____________________    _____________   _____________   _____________   ______________   ______________   ______________   ______________   ______________   _____________   _____________   ______________   ______________   _____________   _______________

           Bus_1            1.04<-0.7246°   1.028<-1.55°    0.9885<-2.461°  0.9844<-1.267°   0.9797<1.273°    0.985<2.83°      0.9867<1.46°     1.015<1.719°     0.9875<5.967°   1.005<10.03°    0.985<3.617°     0.98<3.63°       0.99<4.161°     0.9854<1.129°
           Bus_4            1.04<-0.8284°   1.028<-1.679°   0.9885<-2.555°  0.9844<-1.362°   0.9797<1.177°    0.985<2.733°     0.9867<1.363°    1.015<1.623°     0.9875<5.869°   1.005<9.928°    0.985<3.519°     0.98<3.531°      0.99<4.062°     0.9854<1.03°
           Bus_6            1.04<-0.7265°   1.028<-1.552°   0.9885<-2.462°  0.9844<-1.268°   0.9797<1.271°    0.985<2.828°     0.9867<1.458°    1.015<1.718°     0.9875<5.965°   1.005<10.02°    0.985<3.615°     0.98<3.628°      0.99<4.159°     0.9854<1.127°
           Bus_8            1.04<-0.9091°   1.028<-1.779°   0.9885<-2.629°  0.9844<-1.436°   0.9797<1.102°    0.985<2.658°     0.9867<1.288°    1.015<1.547°     0.9875<5.793°   1.005<9.852°    0.985<3.442°     0.98<3.455°      0.99<3.985°     0.9854<0.9534°
           Bus_10           1.04<-4.769°    1.028<-6.554°   0.9885<-6.155°  0.9844<-4.985°   0.9797<-2.483°   0.985<-0.9451°   0.9867<-2.315°   1.015<-2.055°    0.9875<2.16°    1.005<6.198°    0.985<-0.2166°   0.98<-0.2103°    0.99<0.3108°    0.9854<-2.73°
           Bus_12           1.04<-1.413°    1.028<-2.405°   0.9885<-3.088°  0.9844<-1.898°   0.9797<0.6345°   0.985<2.188°     0.9867<0.8186°   1.015<1.078°     0.9875<5.32°    1.005<9.376°    0.985<2.965°     0.98<2.977°      0.99<3.506°     0.9854<0.4731°
           Bus_15           1.04<-0.4351°   1.028<-1.19°    0.9886<-2.196°  0.9844<-1.001°   0.9797<1.541°    0.985<3.099°     0.9867<1.73°     1.015<1.989°     0.9874<6.239°   1.005<10.3°     0.985<3.891°     0.98<3.904°      0.99<4.436°     0.9854<1.405°
           Bus_18           1.04<-0.6633°   1.028<-1.476°   0.9885<-2.404°  0.9844<-1.21°    0.9797<1.33°     0.985<2.887°     0.9867<1.518°    1.015<1.777°     0.9875<6.025°   1.005<10.08°    0.985<3.675°     0.98<3.688°      0.99<4.219°     0.9854<1.188°
           Bus_19           1.04<-0.7726°   1.028<-1.61°    0.9885<-2.504°  0.9844<-1.31°    0.9797<1.229°    0.985<2.785°     0.9867<1.416°    1.015<1.675°     0.9875<5.922°   1.005<9.981°    0.985<3.572°     0.98<3.584°      0.99<4.115°     0.9854<1.084°
           Bus_24           1.04<-1.032°    1.028<-1.945°   0.9885<-2.736°  0.9844<-1.544°   0.9797<0.9917°   0.985<2.547°     0.9867<1.177°    1.015<1.437°     0.9875<5.681°   1.005<9.739°    0.985<3.329°     0.98<3.341°      0.99<3.871°     0.9854<0.8388°
           Bus_25           1.04<-2.683°    1.028<-3.887°   0.9885<-4.28°   0.9844<-3.096°   0.9797<-0.5713°  0.985<0.9781°    0.9867<-0.3913°  1.015<-0.1321°   0.9875<4.103°   1.005<8.154°    0.985<1.742°     0.98<1.752°      0.99<2.28°      0.9854<-0.7555°
           Bus_26           1.04<-3.448°    1.028<-4.836°   0.9885<-4.979°  0.9844<-3.798°   0.9797<-1.281°   0.985<0.2646°    0.9867<-1.105°   1.015<-0.8456°   0.9875<3.383°   1.005<7.43°     0.985<1.017°     0.98<1.026°      0.99<1.552°     0.9854<-1.485°
           Bus_27           1.04<-0.6062°   1.028<-1.429°   0.9885<-2.343°  0.9844<-1.149°   0.9797<1.39°     0.985<2.947°     0.9867<1.578°    1.015<1.837°     0.9875<6.085°   1.005<10.14°    0.985<3.735°     0.98<3.748°      0.99<4.278°     0.9854<1.247°
           Bus_31           1.04<-0.8494°   1.028<-1.715°   0.9885<-2.571°  0.9844<-1.377°   0.9797<1.16°     0.985<2.716°     0.9867<1.347°    1.015<1.606°     0.9875<5.852°   1.005<9.911°    0.985<3.501°     0.98<3.514°      0.99<4.044°     0.9854<1.012°
           Bus_32           1.04<-0.6883°   1.028<-1.527°   0.9885<-2.419°  0.9844<-1.226°   0.9797<1.313°    0.985<2.87°      0.9867<1.5°      1.015<1.76°      0.9875<6.007°   1.005<10.07°    0.985<3.656°     0.98<3.669°      0.99<4.2°       0.9854<1.168°
           Bus_34           1.04<-0.6642°   1.028<-1.458°   0.9885<-2.411°  0.9844<-1.217°   0.9797<1.324°    0.985<2.881°     0.9867<1.512°    1.015<1.771°     0.9875<6.019°   1.005<10.08°    0.985<3.67°      0.98<3.683°      0.99<4.215°     0.9854<1.184°
           Bus_36           1.04<-0.8774°   1.028<-1.731°   0.9885<-2.603°  0.9844<-1.41°    0.9797<1.129°    0.985<2.685°     0.9867<1.315°    1.015<1.574°     0.9875<5.821°   1.005<9.88°     0.985<3.47°      0.98<3.483°      0.99<4.014°     0.9854<0.982°
           Bus_40           1.04<-0.6017°   1.028<-1.371°   0.9885<-2.358°  0.9844<-1.163°   0.9797<1.379°    0.985<2.937°     0.9867<1.567°    1.015<1.826°     0.9874<6.076°   1.005<10.14°    0.985<3.727°     0.98<3.741°      0.99<4.272°     0.9854<1.241°
           Bus_42           1.04<-0.4013°   1.028<-1.101°   0.9886<-2.183°  0.9844<-0.9859°  0.9797<1.558°    0.985<3.118°     0.9867<1.748°    1.015<2.007°     0.9874<6.259°   1.005<10.32°    0.985<3.913°     0.98<3.926°      0.99<4.458°     0.9854<1.428°
           Bus_46           1.04<-1.059°    1.028<-1.96°    0.9885<-2.767°  0.9844<-1.575°   0.9797<0.9616°   0.985<2.517°     0.9867<1.147°    1.015<1.407°     0.9875<5.652°   1.005<9.709°    0.985<3.3°       0.98<3.312°      0.99<3.842°     0.9854<0.8099°
           Bus_49           1.04<-1.916°    1.028<-3.102°   0.9885<-3.52°   0.9844<-2.334°   0.9797<0.1905°   0.985<1.74°      0.9867<0.3709°   1.015<0.6301°    0.9875<4.866°   1.005<8.917°    0.985<2.506°     0.98<2.516°      0.99<3.043°     0.9854<0.008297°
           Bus_54           1.04<-0.6191°   1.028<-1.37°    0.9886<-2.382°  0.9844<-1.186°   0.9797<1.356°    0.985<2.914°     0.9867<1.545°    1.015<1.804°     0.9874<6.054°   1.005<10.12°    0.985<3.706°     0.98<3.719°      0.99<4.251°     0.9854<1.22°
           Bus_55           1.04<-0.6308°   1.028<-1.385°   0.9886<-2.392°  0.9844<-1.197°   0.9797<1.346°    0.985<2.904°     0.9867<1.534°    1.015<1.793°     0.9874<6.043°   1.005<10.1°     0.985<3.695°     0.98<3.709°      0.99<4.24°      0.9854<1.21°
           Bus_56
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    Generator Removed At         V94              V95             V96             V97             V98             V99              V100              V101              V102             V103            V104            V105            V106            V107            V108            V109            V110            V111            V112
    ____________________    ______________   _____________   _____________   _____________   _____________   _____________   _____________   _______________   _______________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________   _____________

           Bus_1            0.9898<-1.037°   0.9803<-2.011°  0.9923<-2.18°   1.011<-1.803°   1.024<-2.281°   1.01<-2.648°    1.017<-1.656°   0.9914<-0.07008°  0.9891<2.646°     1.001<-5.256°   0.971<-7.995°   0.965<-9.103°   0.9611<-9.357°  0.952<-12.16°   0.9662<-10.3°   0.967<-10.76°   0.973<-11.6°    0.98<-9.957°    0.975<-14.7°
           Bus_4            0.9898<-1.136°   0.9803<-2.11°   0.9923<-2.279°  1.011<-1.904°   1.024<-2.384°   1.01<-2.749°    1.017<-1.756°   0.9914<-0.1697°   0.9891<2.547°     1.001<-5.357°   0.971<-8.095°   0.965<-9.203°   0.9611<-9.458°  0.952<-12.26°   0.9662<-10.4°   0.967<-10.86°   0.973<-11.7°    0.98<-10.06°    0.975<-14.8°
           Bus_6            0.9898<-1.039°   0.9803<-2.013°  0.9923<-2.182°  1.011<-1.805°   1.024<-2.283°   1.01<-2.65°     1.017<-1.658°   0.9914<-0.07193°  0.9891<2.644°     1.001<-5.258°   0.971<-7.997°   0.965<-9.105°   0.9611<-9.359°  0.952<-12.16°   0.9662<-10.3°   0.967<-10.76°   0.973<-11.6°    0.98<-9.958°    0.975<-14.7°
           Bus_8            0.9898<-1.214°   0.9803<-2.187°  0.9923<-2.356°  1.011<-1.983°   1.024<-2.463°   1.01<-2.828°    1.017<-1.834°   0.9914<-0.2471°   0.9891<2.47°      1.001<-5.435°   0.971<-8.173°   0.965<-9.281°   0.9611<-9.535°  0.952<-12.34°   0.9662<-10.48°  0.967<-10.93°   0.973<-11.78°   0.98<-10.13°    0.975<-14.88°
           Bus_10           0.9898<-4.904°   0.9803<-5.869°  0.9922<-6.025°  1.011<-5.748°   1.024<-6.275°   1.01<-6.594°    1.017<-5.562°   0.9914<-3.953°    0.9891<-1.215°    1.001<-9.163°   0.971<-11.9°    0.965<-13.01°   0.9611<-13.26°  0.952<-16.07°   0.9662<-14.21°  0.967<-14.66°   0.973<-15.51°   0.98<-13.86°    0.975<-18.61°
           Bus_12           0.9898<-1.695°   0.9803<-2.667°  0.9923<-2.834°  1.011<-2.474°   1.024<-2.961°   1.01<-3.319°    1.017<-2.32°    0.9914<-0.7303°   0.9891<1.989°     1.001<-5.921°   0.971<-8.66°    0.965<-9.767°   0.9611<-10.02°  0.952<-12.83°   0.9662<-10.97°  0.967<-11.42°   0.973<-12.27°   0.98<-10.62°    0.975<-15.37°
           Bus_15           0.9898<-0.7606°  0.9803<-1.736°  0.9923<-1.905°  1.011<-1.521°   1.024<-1.996°   1.01<-2.366°    1.017<-1.376°   0.9914<0.2076°    0.9891<2.922°     1.001<-4.977°   0.971<-7.716°   0.965<-8.823°   0.9611<-9.078°  0.952<-11.88°   0.9662<-10.02°  0.967<-10.48°   0.973<-11.32°   0.98<-9.677°    0.975<-14.42°
           Bus_18           0.9898<-0.9783°  0.9803<-1.953°  0.9923<-2.122°  1.011<-1.743°   1.024<-2.221°   1.01<-2.588°    1.017<-1.596°   0.9914<-0.01091°  0.9891<2.705°     1.001<-5.197°   0.971<-7.936°   0.965<-9.043°   0.9611<-9.298°  0.952<-12.1°    0.9662<-10.24°  0.967<-10.7°    0.973<-11.54°   0.98<-9.897°    0.975<-14.64°
           Bus_19           0.9898<-1.083°   0.9803<-2.057°  0.9923<-2.226°  1.011<-1.85°    1.024<-2.329°   1.01<-2.695°    1.017<-1.702°   0.9914<-0.116°    0.9891<2.6°       1.001<-5.303°   0.971<-8.041°   0.965<-9.149°   0.9611<-9.404°  0.952<-12.21°   0.9662<-10.35°  0.967<-10.8°    0.973<-11.65°   0.98<-10°       0.975<-14.75°
           Bus_24           0.9898<-1.329°   0.9803<-2.302°  0.9923<-2.47°   1.011<-2.101°   1.024<-2.584°   1.01<-2.946°    1.017<-1.951°   0.9914<-0.3628°   0.9891<2.355°     1.001<-5.551°   0.971<-8.29°    0.965<-9.398°   0.9611<-9.652°  0.952<-12.46°   0.9662<-10.6°   0.967<-11.05°   0.973<-11.9°    0.98<-10.25°    0.975<-15°
           Bus_25           0.9898<-2.925°   0.9803<-3.896°  0.9922<-4.06°   1.011<-3.722°   1.024<-4.219°   1.01<-4.567°    1.017<-3.559°   0.9914<-1.964°    0.9891<0.7605°    1.001<-7.16°    0.971<-9.899°   0.965<-11.01°   0.9611<-11.26°  0.952<-14.06°   0.9662<-12.21°  0.967<-12.66°   0.973<-13.51°   0.98<-11.86°    0.975<-16.6°
           Bus_26           0.9898<-3.656°   0.9803<-4.625°  0.9922<-4.787°  1.011<-4.468°   1.024<-4.974°   1.01<-5.313°    1.017<-4.298°   0.9914<-2.698°    0.9891<0.03051°   1.001<-7.899°   0.971<-10.64°   0.965<-11.74°   0.9611<-12°     0.952<-14.8°    0.9662<-12.94°  0.967<-13.4°    0.973<-14.24°   0.98<-12.6°     0.975<-17.34°
           Bus_27           0.9898<-0.9193°  0.9803<-1.894°  0.9923<-2.063°  1.011<-1.685°   1.024<-2.163°   1.01<-2.53°     1.017<-1.538°   0.9914<0.04788°   0.9891<2.764°     1.001<-5.138°   0.971<-7.877°   0.965<-8.985°   0.9611<-9.239°  0.952<-12.04°   0.9662<-10.18°  0.967<-10.64°   0.973<-11.48°   0.98<-9.838°    0.975<-14.58°
           Bus_31           0.9898<-1.155°   0.9803<-2.128°  0.9923<-2.297°  1.011<-1.924°   1.024<-2.404°   1.01<-2.768°    1.017<-1.775°   0.9914<-0.188°    0.9891<2.529°     1.001<-5.375°   0.971<-8.114°   0.965<-9.222°   0.9611<-9.476°  0.952<-12.28°   0.9662<-10.42°  0.967<-10.87°   0.973<-11.72°   0.98<-10.08°    0.975<-14.82°
           Bus_32           0.9898<-0.9984°  0.9803<-1.972°  0.9923<-2.141°  1.011<-1.765°   1.024<-2.244°   1.01<-2.61°     1.017<-1.617°   0.9914<-0.03143°  0.9891<2.685°     1.001<-5.218°   0.971<-7.957°   0.965<-9.064°   0.9611<-9.319°  0.952<-12.12°   0.9662<-10.26°  0.967<-10.72°   0.973<-11.56°   0.98<-9.918°    0.975<-14.66°
           Bus_34           0.9898<-0.9826°  0.9803<-1.957°  0.9923<-2.126°  1.011<-1.746°   1.024<-2.223°   1.01<-2.591°    1.017<-1.6°     0.9914<-0.01491°  0.9891<2.7°       1.001<-5.2°     0.971<-7.939°   0.965<-9.047°   0.9611<-9.301°  0.952<-12.11°   0.9662<-10.25°  0.967<-10.7°    0.973<-11.55°   0.98<-9.901°    0.975<-14.64°
           Bus_36           0.9898<-1.185°   0.9803<-2.159°  0.9923<-2.327°  1.011<-1.953°   1.024<-2.433°   1.01<-2.798°    1.017<-1.804°   0.9914<-0.2181°   0.9891<2.499°     1.001<-5.405°   0.971<-8.144°   0.965<-9.252°   0.9611<-9.506°  0.952<-12.31°   0.9662<-10.45°  0.967<-10.9°    0.973<-11.75°   0.98<-10.11°    0.975<-14.85°
           Bus_40           0.9898<-0.9247°  0.9803<-1.899°  0.9923<-2.069°  1.011<-1.686°   1.024<-2.161°   1.01<-2.531°    1.017<-1.541°   0.9914<0.04336°   0.9891<2.758°     1.001<-5.142°   0.971<-7.88°    0.965<-8.988°   0.9611<-9.243°  0.952<-12.05°   0.9662<-10.19°  0.967<-10.64°   0.973<-11.49°   0.98<-9.842°    0.975<-14.59°
           Bus_42           0.9898<-0.7372°  0.9803<-1.713°  0.9923<-1.883°  1.011<-1.493°   1.024<-1.965°   1.01<-2.337°    1.017<-1.351°   0.9914<0.232°     0.9891<2.945°     1.001<-4.951°   0.971<-7.69°    0.965<-8.798°   0.9611<-9.052°  0.952<-11.86°   0.9662<-9.997°  0.967<-10.45°   0.973<-11.3°    0.98<-9.651°    0.975<-14.4°
           Bus_46           0.9898<-1.357°   0.9803<-2.331°  0.9923<-2.499°  1.011<-2.129°   1.024<-2.611°   1.01<-2.974°    1.017<-1.979°   0.9914<-0.3914°   0.9891<2.326°     1.001<-5.58°    0.971<-8.318°   0.965<-9.426°   0.9611<-9.68°   0.952<-12.48°   0.9662<-10.63°  0.967<-11.08°   0.973<-11.92°   0.98<-10.28°    0.975<-15.02°
           Bus_49           0.9898<-2.161°   0.9803<-3.132°  0.9922<-3.296°  1.011<-2.956°   1.024<-3.453°   1.01<-3.802°    1.017<-2.795°   0.9914<-1.2°      0.9891<1.524°     1.001<-6.395°   0.971<-9.134°   0.965<-10.24°   0.9611<-10.5°   0.952<-13.3°    0.9662<-11.44°  0.967<-11.89°   0.973<-12.74°   0.98<-11.1°     0.975<-15.84°
           Bus_54           0.9898<-0.9454°  0.9803<-1.92°   0.9923<-2.09°   1.011<-1.705°   1.024<-2.18°    1.01<-2.55°     1.017<-1.561°   0.9914<0.02291°   0.9891<2.737°     1.001<-5.162°   0.971<-7.9°     0.965<-9.008°   0.9611<-9.262°  0.952<-12.07°   0.9662<-10.21°  0.967<-10.66°   0.973<-11.51°   0.98<-9.862°    0.975<-14.61°
           Bus_55           0.9898<-0.9564°  0.9803<-1.931°  0.9923<-2.101°  1.011<-1.717°   1.024<-2.191°   1.01<-2.561°    1.017<-1.572°   0.9914<0.01187°   0.9891<2.726°     1.001<-5.173°   0.971<-7.911°   0.965<-9.019°   0.9611<-9.274°  0.952<-12.08°   0.9662<-10.22°  0.967<-10.67°   0.973<-11.52°   0.98<-9.873°    0.975<-14.62°
           Bus_56
```

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 The Load flow analysis does not converge under N-1 Contingency when the following Lines removed:

  ,

 The Load flow analysis Violated the voltage magnintude limits under N-1 Contingency when the following Genreator removed At:

-----------|V|<0.9  Voltage limit Violation ----------

    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_1 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_4 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_6 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_8 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_10 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_12 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_15 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_18 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_19 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_24 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_25 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_26 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_27 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_31 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_32 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_34 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_36 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_40 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_42 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_46 Removed:
    "Bus52"    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_49 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_54 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_55 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_56 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_59 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_61 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_62 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_65 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_66 Removed:
    "Bus53"    "Bus76"
Generator at Bus_70 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_72 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_73 Removed:
    "Bus53"    "Bus76"
Generator at Bus_74 Removed:
Bus53
Generator at Bus_76 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_77 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_80 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_85 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_87 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_89 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_90 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_91 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_92 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_99 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_100 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_103 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_104 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_105 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_107 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_110 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_111 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_112 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_113 Removed:
    "Bus53"    "Bus76"    "Bus118"
Generator at Bus_116 Removed:

--------------|V|>1.10   Voltage limit Violation----------

Generator at Bus_1 Removed:
Bus10
Generator at Bus_10 Removed:
    "Bus9"    "Bus10"
Generator at Bus_19 Removed:
Bus66
Generator at Bus_26 Removed:
Bus26
Generator at Bus_32 Removed:
Bus10
Generator at Bus_49 Removed:
Bus25
Generator at Bus_80 Removed:
Bus25

-----------------------------------------------------End of report--------------------------------------------------
```

Functions

Admittance matrix of system.

Variable and Function Defintion.