```
"E:\1 □□□□\3 □□□□□\1 □□□□□□\1 □□□□□□□\1_□□□□□□_□□□□\1_LW _□□□□\4 □□□□\3 python_code\1 exzample\2 □□□□□□\9 Code for this paper\Scripts\python.exe" "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\pydevconsole.py" --mode=client --port=9366

import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['E:\\1 □□□□\\3 □□□□□□\\1 □□□□□□□\\1 □□□□□□□□□\\1_□□□□□□_□□□□\\1_LW _□□□□\\4 □□□□\\3 python_code\\9 Code for this paper', 'E:/1 □□□□/3 □□□□□/1 □□□□□□/1 □□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper'])

PyDev console: starting.

Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC v.1929 64 bit (AMD64)] on win32
>>> runfile('E:/1 □□□□/3 □□□□□/1 □□□□□□□/1 □□□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper/main_ECCG_deterministic.py', wdir='E:/1 □□□□/3 □□□□□/1 □□□□□□□/1 □□□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper')
Backend TkAgg is interactive backend. Turning interactive mode on.
Waiting 5s.....

Optimize the  ./R_12_1.xlsx  instance by ECCG for deterministic model

Set parameter MIPGap to value 0.01
      Master protblem status =  2 , is Optimal and MP obj =  451.0
The initial lb =  -inf       ub =  inf

The current iteration cnt =  0
      The SP model was solved Optimal 2 and SPObj =  451.0
      Deterministic Sub problem Status=  2 , is Optimal
      Master protblem status =  2 , is Optimal
      lb =  766.0                  ub =  766.0
       MPObj =  766.0     MP_delete_Hua_Obj =  451.0       Hua =  315.0       SPObj =  451.0       MP_SP_Obj =  315.0         Deter_SP_Obj =  315.0

ub - lb =  0.0

Iteration cycle stopped by termination criterion 1: Because ub - lb <= eps, the iteration stop, and cnt =  0
    i:  0.0  l_i:  6.0   p_i:  14.0    aI_i:  2.0       sol_a_i:  2.0    sol_g_i:  0.0    d_i:  14.0    sol_taoi:  2.0   sol_deltai:  21.0  sol_deltai - sol_taoi:  19.0   sol_taoP:  2.0    sol_deltaP:  6.0   sol_deltaP - sol_taoP:  4.0   cI_i:  4827990.0     sol_c_i:  4827990.0    sol_gp_i:  0.0  total work:  5141058.0    wasted work:  1.1874649148093641
    i:  1.0  l_i:  7.0   p_i:  0.0   aI_i:  5.0       sol_a_i:  5.0    sol_g_i:  0.0    d_i:  15.0    sol_taoi:  5.0   sol_deltai:  21.0  sol_deltai - sol_taoi:  16.0   sol_taoP:  5.0    sol_deltaP:  11.0    sol_deltaP - sol_taoP:  6.0   cI_i:  3973929.0     sol_c_i:  3973929.0    sol_gp_i:  0.0  total work:  4218304.0    wasted work:  0.9269128066635312
    i:  2.0  l_i:  7.0   p_i:  7.0   aI_i:  9.0       sol_a_i:  9.0    sol_g_i:  0.0    d_i:  24.0    sol_taoi:  9.0   sol_deltai:  34.0  sol_deltai - sol_taoi:  25.0   sol_taoP:  9.0    sol_deltaP:  14.0    sol_deltaP - sol_taoP:  5.0   cI_i:  6489910.0     sol_c_i:  6489910.0    sol_gp_i:  0.0  total work:  6591100.0    wasted work:  0.3838130205883692
    i:  3.0  l_i:  6.0   p_i:  20.0    aI_i:  10.0      sol_a_i:  10.0  sol_g_i:  0.0    d_i:  14.0    sol_taoi:  10.0    sol_deltai:  14.0  sol_deltai - sol_taoi:  4.0    sol_taoP:  10.0  sol_deltaP:  12.0    sol_deltaP - sol_taoP:  2.0   cI_i:  1036688.0     sol_c_i:  1036688.0    sol_gp_i:  0.0  total work:  1054576.0    wasted work:  0.06784906919937492
    i:  4.0  l_i:  7.0   p_i:  26.0    aI_i:  13.0      sol_a_i:  13.0  sol_g_i:  0.0    d_i:  18.0    sol_taoi:  13.0    sol_deltai:  18.0  sol_deltai - sol_taoi:  5.0    sol_taoP:  13.0  sol_deltaP:  15.0    sol_deltaP - sol_taoP:  2.0   cI_i:  1300263.0     sol_c_i:  1300263.0    sol_gp_i:  0.0  total work:  1450042.0    wasted work:  0.5681107857565505
    i:  5.0  l_i:  5.0   p_i:  14.0    aI_i:  22.0      sol_a_i:  22.0  sol_g_i:  0.0    d_i:  27.0    sol_taoi:  22.0    sol_deltai:  29.0  sol_deltai - sol_taoi:  7.0    sol_taoP:  22.0  sol_deltaP:  25.0    sol_deltaP - sol_taoP:  3.0   cI_i:  1714644.0     sol_c_i:  1714644.0    sol_gp_i:  0.0  total work:  2109152.0    wasted work:  1.4963663121481998
    i:  6.0  l_i:  5.0   p_i:  19.0    aI_i:  23.0      sol_a_i:  23.0  sol_g_i:  0.0    d_i:  33.0    sol_taoi:  23.0    sol_deltai:  28.0  sol_deltai - sol_taoi:  5.0    sol_taoP:  23.0  sol_deltaP:  24.0    sol_deltaP - sol_taoP:  1.0   cI_i:  1171409.0     sol_c_i:  1171409.0    sol_gp_i:  0.0  total work:  1186398.0    wasted work:  0.05685318080441808
    i:  7.0  l_i:  6.0   p_i:  0.0   aI_i:  27.0      sol_a_i:  27.0  sol_g_i:  0.0    d_i:  60.0    sol_taoi:  27.0    sol_deltai:  56.0  sol_deltai - sol_taoi:  29.0   sol_taoP:  27.0    sol_deltaP:  35.0    sol_deltaP - sol_taoP:  8.0   cI_i:  7632041.0     sol_c_i:  7632041.0    sol_gp_i:  0.0  total work:  7645676.0    wasted work:  0.051717467494045
    i:  8.0  l_i:  6.0   p_i:  14.0    aI_i:  30.0      sol_a_i:  30.0  sol_g_i:  0.0    d_i:  70.0    sol_taoi:  30.0    sol_deltai:  65.0  sol_deltai - sol_taoi:  35.0   sol_taoP:  30.0  sol_deltaP:  37.0    sol_deltaP - sol_taoP:  7.0   cI_i:  8969412.0     sol_c_i:  8969412.0    sol_gp_i:  0.0  total work:  9095718.0    wasted work:  0.4790778474002822
    i:  9.0  l_i:  6.0   p_i:  20.0    aI_i:  34.0      sol_a_i:  34.0  sol_g_i:  0.0    d_i:  60.0    sol_taoi:  34.0    sol_deltai:  56.0  sol_deltai - sol_taoi:  22.0   sol_taoP:  34.0  sol_deltaP:  39.0    sol_deltaP - sol_taoP:  5.0   cI_i:  5766334.0     sol_c_i:  5766334.0    sol_gp_i:  0.0  total work:  5931990.0    wasted work:  0.6283321448620109
    i:  10.0   l_i:  7.0   p_i:  26.0    aI_i:  43.0      sol_a_i:  43.0  sol_g_i:  0.0    d_i:  55.0    sol_taoi:  43.0    sol_deltai:  48.0  sol_deltai - sol_taoi:  5.0    sol_taoP:  43.0    sol_deltaP:  44.0    sol_deltaP - sol_taoP:  1.0   cI_i:  1218429.0     sol_c_i:  1218429.0    sol_gp_i:  0.0  total work:  1318220.0    wasted work:  0.3785066225667946
    i:  11.0   l_i:  6.0   p_i:  26.0    aI_i:  50.0      sol_a_i:  50.0  sol_g_i:  0.0    d_i:  63.0    sol_taoi:  50.0    sol_deltai:  61.0  sol_deltai - sol_taoi:  11.0    sol_taoP:  50.0    sol_deltaP:  53.0    sol_deltaP - sol_taoP:  3.0   cI_i:  2724812.0     sol_c_i:  2724812.0    sol_gp_i:  0.0  total work:  3954660.0    wasted work:  4.664805571148974
Time: 109.000000
```