```
D:\Python\Python\setroute\python.exe "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\pydevconsole.py" --mode=client --port=1400

import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['E:\\1 □□□□\\3 □□□□□\\1 □□□□□□□\\1 □□□□□□□□□\\1_□□□□□□_□□□□\\1_LW _□□□□1\\4 □□□□\\3 python_code\\9 Code for this paper', 'E:/1 □□□□/3 □□□□□/1 □□□□□□/1 □□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□1/4 □□□□/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 _□□□□1/4 □□□□/3 python_code/9 Code for this paper/main_RO_CCG_ExtendedByMe.py', wdir='E:/1 □□□□/3 □□□□□/1 □□□□□□□/1 □□□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□1/4 □□□□/3 python_code/9 Code for this paper')
Backend TkAgg is interactive backend. Turning interactive mode on.
Waiting 5s.....

Optimize the  ./R_18_4.xlsx  instance by ECCG

        Master protblem status =  2 , is Optimal and MP obj =  1012.0
The initial lb =  -inf        ub =  inf

The current iteration cnt =  0
        The SP model was solved Optimal 2 and SPObj =  1009.0
Set parameter TimeLimit to value 1200
        Deterministic Sub problem Status=  2 , is Optimal
        Master protblem status =  2 , is Optimal
        lb =  1913.0                    ub =  1913.0
         MPObj =  1913.0        MP_delete_Hua_Obj =  1042.0      Hua =  871.0       SPObj =  1009.0          Deter_SP_Obj =  871.0

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: 23.0  aI_i: 59.0  sol_a_i: 59.0  sol_g_i: 0.0  d_i: 74.0  sol_taoi: 59.0  sol_deltai: 78.0  sol_deltai - sol_taoi: 19.0  sol_taoP: 59.0  sol_deltaP: 65.0  sol_deltaP - sol_taoP: 6.0  cI_i: 4923592.0  sol_c_i: 4923592.0  sol_gp_i: 0.0  total work: 5141058.0  wasted work: 0.8248471423586351
     i: 1.0  l_i: 5.0  p_i: -0.0  aI_i: 57.0  sol_a_i: 57.0  sol_g_i: 0.0  d_i: 69.0  sol_taoi: 57.0  sol_deltai: 72.0  sol_deltai - sol_taoi: 15.0  sol_taoP: 57.0  sol_deltaP: 61.0  sol_deltaP - sol_taoP: 4.0  cI_i: 3860630.0  sol_c_i: 3860630.0  sol_gp_i: 0.0  total work: 3954660.0  wasted work: 0.35665518653942435
     i: 2.0  l_i: 6.0  p_i: 8.0  aI_i: 48.0  sol_a_i: 48.0  sol_g_i: 0.0  d_i: 55.0  sol_taoi: 48.0  sol_deltai: 57.0  sol_deltai - sol_taoi: 9.0  sol_taoP: 48.0  sol_deltaP: 51.0  sol_deltaP - sol_taoP: 3.0  cI_i: 2369296.0  sol_c_i: 2369296.0  sol_gp_i: 0.0  total work: 2372796.0  wasted work: 0.013275477537892006
     i: 3.0  l_i: 4.0  p_i: 10.0  aI_i: 10.0  sol_a_i: 10.0  sol_g_i: 0.0  d_i: 16.0  sol_taoi: 10.0  sol_deltai: 18.0  sol_deltai - sol_taoi: 8.0  sol_taoP: 10.0  sol_deltaP: 13.0  sol_deltaP - sol_taoP: 3.0  cI_i: 1989904.0  sol_c_i: 1989904.0  sol_gp_i: 0.0  total work: 2109152.0  wasted work: 0.4523068986967274
     i: 4.0  l_i: 4.0  p_i: 20.0  aI_i: 15.0  sol_a_i: 15.0  sol_g_i: 0.0  d_i: 26.0  sol_taoi: 15.0  sol_deltai: 29.0  sol_deltai - sol_taoi: 14.0  sol_taoP: 17.0  sol_deltaP: 24.0  sol_deltaP - sol_taoP: 7.0  cI_i: 3456313.0  sol_c_i: 3456313.0  sol_gp_i: 0.0  total work: 3691016.0  wasted work: 0.8902269727359622
     i: 5.0  l_i: 5.0  p_i: 25.0  aI_i: 38.0  sol_a_i: 38.0  sol_g_i: 0.0  d_i: 51.0  sol_taoi: 38.0  sol_deltai: 55.0  sol_deltai - sol_taoi: 17.0  sol_taoP: 38.0  sol_deltaP: 41.0  sol_deltaP - sol_taoP: 3.0  cI_i: 4255636.0  sol_c_i: 4255636.0  sol_gp_i: 0.0  total work: 4481948.0  wasted work: 0.8583999635872616
     i: 6.0  l_i: 4.0  p_i: 30.0  aI_i: 55.0  sol_a_i: 55.0  sol_g_i: 0.0  d_i: 66.0  sol_taoi: 55.0  sol_deltai: 69.0  sol_deltai - sol_taoi: 14.0  sol_taoP: 55.0  sol_deltaP: 58.0  sol_deltaP - sol_taoP: 3.0  cI_i: 3659858.0  sol_c_i: 3659858.0  sol_gp_i: 0.0  total work: 3954660.0  wasted work: 1.1181820940358969
     i: 7.0  l_i: 6.0  p_i: 24.0  aI_i: 3.0  sol_a_i: 3.0  sol_g_i: 0.0  d_i: 13.0  sol_taoi: 3.0  sol_deltai: 16.0  sol_deltai - sol_taoi: 13.0  sol_taoP: 3.0  sol_deltaP: 6.0  sol_deltaP - sol_taoP: 3.0  cI_i: 3380801.0  sol_c_i: 3380801.0  sol_gp_i: 0.0  total work: 3822838.0  wasted work: 1.676643504119191
     i: 8.0  l_i: 4.0  p_i: 11.0  aI_i: 63.0  sol_a_i: 63.0  sol_g_i: 0.0  d_i: 76.0  sol_taoi: 63.0  sol_deltai: 80.0  sol_deltai - sol_taoi: 17.0  sol_taoP: 63.0  sol_deltaP: 68.0  sol_deltaP - sol_taoP: 5.0  cI_i: 4344824.0  sol_c_i: 4344824.0  sol_gp_i: 0.0  total work: 4481948.0  wasted work: 0.5201104519731152
     i: 9.0  l_i: 6.0  p_i: 17.0  aI_i: 64.0  sol_a_i: 64.0  sol_g_i: 0.0  d_i: 76.0  sol_taoi: 64.0  sol_deltai: 80.0  sol_deltai - sol_taoi: 16.0  sol_taoP: 64.0  sol_deltaP: 67.0  sol_deltaP - sol_taoP: 3.0  cI_i: 4152019.0  sol_c_i: 4152019.0  sol_gp_i: 0.0  total work: 4218304.0  wasted work: 0.2514185795997633
     i: 10.0  l_i: 5.0  p_i: 14.0  aI_i: 39.0  sol_a_i: 39.0  sol_g_i: 0.0  d_i: 52.0  sol_taoi: 39.0  sol_deltai: 56.0  sol_deltai - sol_taoi: 17.0  sol_taoP: 39.0  sol_deltaP: 43.0  sol_deltaP - sol_taoP: 4.0  cI_i: 4295445.0  sol_c_i: 4295445.0  sol_gp_i: 0.0  total work: 4745592.0  wasted work: 1.707404682071278
     i: 11.0  l_i: 5.0  p_i: 29.0  aI_i: 70.0  sol_a_i: 71.0  sol_g_i: 0.2  d_i: 83.0  sol_taoi: 71.0  sol_deltai: 88.0  sol_deltai - sol_taoi: 17.0  sol_taoP: 71.0  sol_deltaP: 77.0  sol_deltaP - sol_taoP: 6.0  cI_i: 4396569.0  sol_c_i: 5240229.8  sol_gp_i: 0.8  total work: 5536524.0  wasted work: 1.1238419990593382
     i: 12.0  l_i: 6.0  p_i: 14.0  aI_i: 6.0  sol_a_i: 14.0  sol_g_i: 1.0  d_i: 26.0  sol_taoi: 14.0  sol_deltai: 30.0  sol_deltai - sol_taoi: 16.0  sol_taoP: 14.0  sol_deltaP: 20.0  sol_deltaP - sol_taoP: 6.0  cI_i: 4086488.0  sol_c_i: 4745592.0  sol_gp_i: 0.35713960600550093  total work: 4745592.0  wasted work: 0.0
     i: 13.0  l_i: 6.0  p_i: 5.0  aI_i: 65.0  sol_a_i: 67.68253968253968  sol_g_i: 0.26825396825396824  d_i: 80.0  sol_taoi: 68.0  sol_deltai: 81.0  sol_deltai - sol_taoi: 13.0  sol_taoP: 68.0  sol_deltaP: 72.0  sol_deltaP - sol_taoP: 4.0  cI_i: 3334757.0  sol_c_i: 3597571.171428571  sol_gp_i: 0.49842623277709924  total work: 4218304.0  wasted work: 2.3544356350663356
     i: 14.0  l_i: 4.0  p_i: 19.0  aI_i: 43.0  sol_a_i: 49.0  sol_g_i: 0.8571428571428571  d_i: 54.0  sol_taoi: 49.0  sol_deltai: 63.0  sol_deltai - sol_taoi: 14.0  sol_taoP: 50.0  sol_deltaP: 53.0  sol_deltaP - sol_taoP: 3.0  cI_i: 3540267.0  sol_c_i: 4481948.0  sol_gp_i: 0.7143579979062675  total work: 4481948.0  wasted work: 0.0
     i: 15.0  l_i: 5.0  p_i: -0.0  aI_i: 74.0  sol_a_i: 76.0  sol_g_i: 0.2857142857142857  d_i: 83.0  sol_taoi: 76.0  sol_deltai: 84.0  sol_deltai - sol_taoi: 8.0  sol_taoP: 76.0  sol_deltaP: 80.0  sol_deltaP - sol_taoP: 4.0  cI_i: 2103670.0  sol_c_i: 2900084.0  sol_gp_i: 0.37759914885224016  total work: 3163728.0  wasted work: 1.0
     i: 16.0  l_i: 6.0  p_i: 2.0  aI_i: 27.0  sol_a_i: 32.0  sol_g_i: 0.8333333333333334  d_i: 43.0  sol_taoi: 32.0  sol_deltai: 49.0  sol_deltai - sol_taoi: 17.0  sol_taoP: 32.0  sol_deltaP: 42.0  sol_deltaP - sol_taoP: 10.0  cI_i: 4339302.0  sol_c_i: 5009236.0  sol_gp_i: 0.5082110725068654  total work: 5009236.0  wasted work: 0.0
     i: 17.0  l_i: 5.0  p_i: 24.0  aI_i: 19.0  sol_a_i: 24.0  sol_g_i: 0.5555555555555556  d_i: 38.0  sol_taoi: 24.0  sol_deltai: 37.0  sol_deltai -
```

```
46  sol_taoi:  13.0  sol_taoP:  24.0    sol_deltaP:  30.0    sol_deltaP - sol_taoP:  6.0  cl_i:  3307644.0    sol_c_i:  4877414.0    sol_gp_i:  0.7442659419520262
    total work:  5009236.0    wasted work:  0.5
47  Time: 119.000000
48
49
50
51
```