```
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=26626

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.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 CCG

        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
        Master protblem status =  2 , is Optimal
        Deterministic Sub problem Status=  2 , is Optimal
        lb =  1895.0                    ub =  1895.0
         MPObj =  1895.0        MP_delete_Hua_Obj =  1041.0      Hua =  854.0       SPObj =  1009.0          Deter_SP_Obj =  854.0

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: 18.0    al_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  cl_i: 4923592.0     sol_c_i: 4923592.0    sol_gp_i: 0.0  total work: 5009236.0    wasted work: 0.32484714235863515
     i: 1.0  l_i: 5.0   p_i: 13.0    al_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: 60.0     sol_deltaP - sol_taoP: 3.0  cl_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: 28.0    al_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  cl_i: 2369296.0     sol_c_i: 2369296.0    sol_gp_i: 0.0  total work: 2768262.0    wasted work: 1.513275477537892
     i: 3.0  l_i: 4.0   p_i: 10.0    al_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  cl_i: 1989904.0     sol_c_i: 1989904.0    sol_gp_i: 0.0  total work: 2240974.0    wasted work: 0.9523068986967274
     i: 4.0  l_i: 4.0   p_i: 14.0    al_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: 15.0  sol_deltaP: 19.0     sol_deltaP - sol_taoP: 4.0  cl_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: 7.0   al_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  cl_i: 4255636.0     sol_c_i: 4255636.0    sol_gp_i: 0.0  total work: 4350126.0    wasted work: 0.3583999635872616
     i: 6.0  l_i: 4.0   p_i: 24.0    al_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  cl_i: 3659858.0     sol_c_i: 3659858.0    sol_gp_i: 0.0  total work: 3822838.0    wasted work: 0.6181820940358969
     i: 7.0  l_i: 6.0   p_i: 24.0    al_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  cl_i: 3380801.0     sol_c_i: 3380801.0    sol_gp_i: 0.0  total work: 3954660.0    wasted work: 2.176643504119191
     i: 8.0  l_i: 4.0   p_i: 30.0    al_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: 67.0     sol_deltaP - sol_taoP: 4.0  cl_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: 0.0   al_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: 68.0     sol_deltaP - sol_taoP: 4.0  cl_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: 12.0    al_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  cl_i: 4295445.0     sol_c_i: 4295445.0    sol_gp_i: 0.0  total work: 4481948.0    wasted work: 0.7074046820712779
     i: 11.0   l_i: 5.0   p_i: 24.0    al_i: 70.0       sol_a_i: 74.0  sol_g_i: 0.8    d_i: 83.0    sol_taoi: 74.0    sol_deltai: 91.0  sol_deltai - sol_taoi: 17.0   sol_taoP: 74.0    sol_deltaP: 81.0     sol_deltaP - sol_taoP: 7.0  cl_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: 18.0    al_i: 6.0        sol_a_i: 7.0   sol_g_i: 0.125    d_i: 26.0    sol_taoi: 7.0   sol_deltai: 23.0  sol_deltai - sol_taoi: 16.0   sol_taoP: 7.0   sol_deltaP: 10.0     sol_deltaP - sol_taoP: 3.0  cl_i: 4086488.0     sol_c_i: 4086488.0    sol_gp_i: 0.0  total work: 4481948.0    wasted work: 1.4999772420385065
     i: 13.0   l_i: 6.0   p_i: 7.0   al_i: 65.0       sol_a_i: 71.94047619047619    sol_g_i: 0.6940476190476159  d_i: 80.0    sol_taoi: 72.0    sol_deltai: 85.0  sol_deltai - sol_taoi: 13.0   sol_taoP: 72.0    sol_deltaP: 75.0     sol_deltaP - sol_taoP: 3.0  cl_i: 3334757.0     sol_c_i: 3691016.0    sol_gp_i: 0.6756440503102669    total work: 3822838.0    wasted work: 0.5
     i: 14.0   l_i: 4.0   p_i: 18.0    al_i: 43.0       sol_a_i: 44.0  sol_g_i: 0.14285714285714285    d_i: 54.0    sol_taoi: 44.0    sol_deltai: 58.0  sol_deltai - sol_taoi: 14.0   sol_taoP: 44.0    sol_deltaP: 47.0     sol_deltaP - sol_taoP: 3.0  cl_i: 3540267.0     sol_c_i: 4745592.0    sol_gp_i: 0.9143579979062676    total work: 4745592.0    wasted work: 0.0
     i: 15.0   l_i: 5.0   p_i: 13.0    al_i: 74.0       sol_a_i: 78.0  sol_g_i: 0.5714285714285714    d_i: 83.0    sol_taoi: 78.0    sol_deltai: 86.0  sol_deltai - sol_taoi: 8.0    sol_taoP: 78.0    sol_deltaP: 80.0     sol_deltaP - sol_taoP: 2.0  cl_i: 2103670.0     sol_c_i: 2172261.5999999987    sol_gp_i: 0.032520937324573396    total work: 2240974.0    wasted work: 0.2602569222213337
     i: 16.0   l_i: 6.0   p_i: 22.0    al_i: 27.0       sol_a_i: 33.0  sol_g_i: 1.0    d_i: 43.0    sol_taoi: 33.0    sol_deltai: 50.0  sol_deltai - sol_taoi: 17.0   sol_taoP: 33.0    sol_deltaP: 39.0     sol_deltaP - sol_taoP: 6.0  cl_i: 4339302.0     sol_c_i: 5272880.0    sol_gp_i: 0.7082110725068653    total work: 5536524.0    wasted work: 1.0
     i: 17.0   l_i: 5.0   p_i: 29.0    al_i: 19.0       sol_a_i: 25.0  sol_g_i: 0.6666666666666666    d_i: 38.0    sol_taoi: 25.0    sol_deltai: 38.0  sol_deltai - sol_taoi: 13.0   sol_taoP: 25.0    sol_deltaP: 31.0     sol_deltaP - sol_taoP: 6.0  cl_i: 3307644.0     sol_c_i: 5141058.0    sol_gp_i: 0.8692659419520262
```

```
45  total work:  5141058.0     wasted work:  0.0
46  Time: 488.000000
47
48
49
50
```