```
1  "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=31960

3  import sys; print('Python %s on %s' % (sys.version, sys.platform))
4  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'])

6  PyDev console: starting.

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

13 Optimize the ./R_11_1.xlsx instance by CCG

15     Master protblem status = 2 , is Optimal and MP obj = 505.0
16 The initial lb = -inf      ub = inf

18 The current iteration cnt = 0
19     The SP model was solved Optimal 2 and SPObj = 505.0
20     Master protblem status = 2 , is Optimal
21     Deterministic Sub problem Status= 2 , is Optimal
22     lb = 930.0           ub = 930.0
23      MPObj = 930.0    MP_delete_Hua_Obj = 528.0      Hua = 402.0      SPObj = 505.0      Deter_SP_Obj = 402.0

25 ub - lb = 0.0

27 Iteration cycle stopped by termination criterion 1: Because ub - lb <= eps, the iteration stop, and cnt = 0
28    i: 0.0  l_i: 5.0   p_i: 9.0  al_i: 72.0     sol_a_i: 72.0 sol_g_i: 0.0   d_i: 81.0   sol_taoi: 72.0   sol_deltai: 77.0 sol_deltai - sol_taoi: 5.0   sol_taoP:
   72.0   sol_deltaP: 73.0    sol_deltaP - sol_taoP: 1.0  cl_i: 1057366.0    sol_c_i: 1057366.0  sol_gp_i: 0.0 total work: 1186398.0   wasted work: 0.
   48941754790550895
29    i: 1.0  l_i: 6.0   p_i: 23.0  al_i: 2.0      sol_a_i: 2.0 sol_g_i: 0.0   d_i: 15.0   sol_taoi: 2.0   sol_deltai: 15.0 sol_deltai - sol_taoi: 13.0 sol_taoP: 2
   .0   sol_deltaP: 5.0  sol_deltaP - sol_taoP: 3.0  cl_i: 3325804.0    sol_c_i: 3325804.0  sol_gp_i: 0.0 total work: 3559194.0   wasted work: 0.
   8852467721624615
30    i: 2.0  l_i: 6.0   p_i: 8.0  al_i: 14.0      sol_a_i: 14.0 sol_g_i: 0.0   d_i: 36.0   sol_taoi: 14.0   sol_deltai: 37.0 sol_deltai - sol_taoi: 23.0 sol_taoP:
   14.0   sol_deltaP: 18.0   sol_deltaP - sol_taoP: 4.0  cl_i: 6030336.0    sol_c_i: 6030336.0  sol_gp_i: 0.0 total work: 6063812.0   wasted work: 0.
   12697425315956365
31    i: 3.0  l_i: 7.0   p_i: 1.0  al_i: 14.0      sol_a_i: 14.0 sol_g_i: 0.0   d_i: 25.0   sol_taoi: 14.0   sol_deltai: 21.0 sol_deltai - sol_taoi: 7.0   sol_taoP:
   14.0   sol_deltaP: 16.0   sol_deltaP - sol_taoP: 2.0  cl_i: 1637737.0    sol_c_i: 1637737.0  sol_gp_i: 0.0 total work: 1845508.0   wasted work: 0.
   7880740695786743
32    i: 4.0  l_i: 5.0   p_i: 14.0  al_i: 20.0      sol_a_i: 20.0 sol_g_i: 0.0   d_i: 44.0   sol_taoi: 20.0   sol_deltai: 41.0 sol_deltai - sol_taoi: 21.0 sol_taoP
   : 20.0  sol_deltaP: 25.0   sol_deltaP - sol_taoP: 5.0  cl_i: 5351141.0    sol_c_i: 5351141.0  sol_gp_i: 0.0 total work: 5404702.0   wasted work: 0.
   2031565292591525
33    i: 5.0  l_i: 7.0   p_i: 19.0  al_i: 24.0      sol_a_i: 24.0 sol_g_i: 0.0   d_i: 30.0   sol_taoi: 24.0   sol_deltai: 29.0 sol_deltai - sol_taoi: 5.0   sol_taoP
   : 24.0  sol_deltaP: 26.0   sol_deltaP - sol_taoP: 2.0  cl_i: 1201427.0    sol_c_i: 1201427.0  sol_gp_i: 0.0 total work: 1450042.0   wasted work: 0.
   9429950994522918
34    i: 6.0  l_i: 6.0   p_i: 19.0  al_i: 29.0      sol_a_i: 30.0 sol_g_i: 0.2   d_i: 48.0   sol_taoi: 30.0   sol_deltai: 48.0 sol_deltai - sol_taoi: 18.0 sol_taoP
   : 30.0  sol_deltaP: 34.0   sol_deltaP - sol_taoP: 4.0  cl_i: 4500077.0    sol_c_i: 4816449.8  sol_gp_i: 0.2 total work: 5009236.0   wasted work: 0.
   7312368193473023
35    i: 7.0  l_i: 6.0   p_i: 13.0  al_i: 34.0      sol_a_i: 42.0 sol_g_i: 1.0   d_i: 63.0   sol_taoi: 42.0   sol_deltai: 71.0 sol_deltai - sol_taoi: 29.0 sol_taoP
   : 42.0  sol_deltaP: 48.0   sol_deltaP - sol_taoP: 6.0  cl_i: 7630244.0    sol_c_i: 8684820.0  sol_gp_i: 1.0 total work: 8963896.0   wasted work: 1.
   058533476961357
36    i: 8.0  l_i: 6.0   p_i: 25.0  al_i: 34.0      sol_a_i: 37.0 sol_g_i: 0.3   d_i: 43.0   sol_taoi: 37.0   sol_deltai: 44.0 sol_deltai - sol_taoi: 7.0   sol_taoP
   : 37.0  sol_deltaP: 39.0   sol_deltaP - sol_taoP: 2.0  cl_i: 1705681.0    sol_c_i: 2338426.6  sol_gp_i: 0.6 total work: 2372796.0   wasted work: 0.
   1303629136259498
37    i: 9.0  l_i: 6.0   p_i: 19.0  al_i: 47.0      sol_a_i: 51.0 sol_g_i: 0.5714285714285714  d_i: 66.0   sol_taoi: 51.0   sol_deltai: 71.0 sol_deltai -
   sol_taoi: 20.0 sol_taoP: 51.0   sol_deltaP: 55.0   sol_deltaP - sol_taoP: 4.0  cl_i: 5229391.0    sol_c_i: 5598492.6  sol_gp_i: 0.2 total work: 5931990.0
   wasted work: 1.264953497898683
38    i: 10.0   l_i: 6.0  p_i: 25.0   al_i: 50.0      sol_a_i: 56.5 sol_g_i: 0.9285714285714286 d_i: 68.0   sol_taoi: 57.0   sol_deltai: 74.0 sol_deltai -
   sol_taoi: 17.0 sol_taoP: 57.0   sol_deltaP: 63.0   sol_deltaP - sol_taoP: 6.0  cl_i: 4322611.0    sol_c_i: 4849899.0  sol_gp_i: 1.0 total work: 5009236.0
   wasted work: 0.6043642184157424
39 Time: 106.000000
40
41
42
43
```