```
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=38899

2
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'])

5
6  PyDev console: starting.
7
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......
12
13 Optimize the  ./R_8_1.xlsx  instance by CCG
14
15     Master protblem status = 2 , is Optimal and MP obj = 287.0
16 The initial lb = -inf      ub = inf
17
18 The current iteration cnt = 0
19     The SP model was solved Optimal 2 and SPObj = 287.0
20     Master protblem status = 2 , is Optimal
21     Deterministic Sub problem Status= 2 , is Optimal
22     lb = 500.0            ub = 500.0
23      MPObj = 500.0    MP_delete_Hua_Obj = 301.0      Hua = 199.0     SPObj = 287.0     Deter_SP_Obj = 199.0
24
25 ub - lb = 0.0
26
27 Iteration cycle stopped by termination criterion 1: Because ub - lb <= eps, the iteration stop, and cnt = 0
28    i: 0.0  l_i: 6.0  p_i: 21.0  al_i: 1.0      sol_a_i: 1.0  sol_g_i: 0.0   d_i: 12.0   sol_taoi: 1.0  sol_deltai: 12.0 sol_deltai - sol_taoi: 11.0  sol_taoP: 1
   .0   sol_deltaP: 5.0  sol_deltaP - sol_taoP: 4.0  cl_i: 2838079.0    sol_c_i: 2838079.0   sol_gp_i: 0.0  total work: 2900084.0   wasted work: 0.
   2351845670677125
29    i: 1.0  l_i: 7.0  p_i: 27.0  al_i: 3.0      sol_a_i: 3.0  sol_g_i: 0.0   d_i: 24.0   sol_taoi: 3.0  sol_deltai: 23.0 sol_deltai - sol_taoi: 20.0 sol_taoP: 3
   .0   sol_deltaP: 7.0  sol_deltaP - sol_taoP: 4.0  cl_i: 5225121.0    sol_c_i: 5225121.0   sol_gp_i: 0.0  total work: 5272880.0   wasted work: 0.
   1811495804949098
30    i: 2.0  l_i: 6.0  p_i: 21.0  al_i: 13.0     sol_a_i: 13.0 sol_g_i: 0.0   d_i: 40.0   sol_taoi: 13.0  sol_deltai: 37.0 sol_deltai - sol_taoi: 24.0 sol_taoP
   : 13.0  sol_deltaP: 17.0   sol_deltaP - sol_taoP: 4.0  cl_i: 6204790.0    sol_c_i: 6204790.0   sol_gp_i: 0.0  total work: 6327456.0   wasted work: 0.
   4652713507608745
31    i: 3.0  l_i: 5.0  p_i: 10.0  al_i: 14.0     sol_a_i: 14.0 sol_g_i: 0.0   d_i: 24.0   sol_taoi: 14.0  sol_deltai: 26.0 sol_deltai - sol_taoi: 12.0 sol_taoP
   : 14.0  sol_deltaP: 18.0   sol_deltaP - sol_taoP: 4.0  cl_i: 2990355.0    sol_c_i: 2990355.0   sol_gp_i: 0.0  total work: 3295550.0   wasted work: 1.
   1576026763362717
32    i: 4.0  l_i: 6.0  p_i: 15.0  al_i: 18.0     sol_a_i: 18.0 sol_g_i: 0.0   d_i: 34.0   sol_taoi: 18.0  sol_deltai: 37.0 sol_deltai - sol_taoi: 19.0 sol_taoP
   : 18.0  sol_deltaP: 24.0   sol_deltaP - sol_taoP: 6.0  cl_i: 4876117.0    sol_c_i: 4876117.0   sol_gp_i: 0.0  total work: 4877414.0   wasted work: 0.
   0049195126676184552
33    i: 5.0  l_i: 7.0  p_i: 7.0  al_i: 24.0      sol_a_i: 28.0 sol_g_i: 0.8   d_i: 50.0   sol_taoi: 28.0   sol_deltai: 55.0 sol_deltai - sol_taoi: 27.0 sol_taoP:
   28.0   sol_deltaP: 35.0   sol_deltaP - sol_taoP: 7.0  cl_i: 6856681.0    sol_c_i: 7118388.0   sol_gp_i: 0.1654421619051954   total work: 7250210.0
   wasted work: 0.5
34    i: 6.0  l_i: 5.0  p_i: 29.0  al_i: 25.0     sol_a_i: 28.0 sol_g_i: 0.3750000000000089 d_i: 43.0   sol_taoi: 28.0   sol_deltai: 42.0 sol_deltai -
   sol_taoi: 14.0 sol_taoP: 28.0   sol_deltaP: 33.0    sol_deltaP - sol_taoP: 5.0  cl_i: 3585255.0    sol_c_i: 4254444.466666667   sol_gp_i: 0.
   6345578380948047    total work: 4613770.0   wasted work: 1.3629194418736372
35    i: 7.0  l_i: 6.0  p_i: 28.0  al_i: 48.0     sol_a_i: 54.25  sol_g_i: 0.6250000000000009 d_i: 62.0   sol_taoi: 55.0   sol_deltai: 69.0 sol_deltai -
   sol_taoi: 14.0 sol_taoP: 55.0   sol_deltaP: 60.0    sol_deltaP - sol_taoP: 5.0  cl_i: 3514769.0    sol_c_i: 4569345.0   sol_gp_i: 1.0  total work: 4613770.0
      wasted work: 0.1685037398916721
36 Time: 65.000000
37
38
39
40
```