```
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=48401

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_BDC.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_2.xlsx  instance by BDC

      Master protblem status =  2 , is Optimal
      sol_MP_obj =  942.0
The initial lb =  -inf       ub =  inf

The current iteration cnt =  0
   Optimization was stopped with status 9
      Dual problem status =  9
      Add optimal cut
      Master protblem status =  2 , is Optimal
      Deterministic Sub problem Status=  2 , is Optimal
      lb =  985.1740311950767                ub =  985.1740311950767
      MPObj =  985.1740311950767     MPObj_Remove_Hua =  975.0     DualSPObj =  10.174031195076735     Hua =  10.174031195076735     Deterministic_SP_SPObj =  802.0

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: 5.0  p_i: -0.0  aI_i: 40.0  sol_a_i: 40.0  sol_g_i: 0.0  d_i: 46.0  sol_taoi: 40.0  sol_deltai: 48.0  sol_deltai - sol_taoi: 8.0  sol_taoP: 40.0  sol_deltaP: 42.0  sol_deltaP - sol_taoP: 2.0  cI_i: 2020547.0  sol_c_i: 2020547.0  sol_gp_i: 0.0  total work: 2109152.0  wasted work: 0.33607819635569175
    i: 1.0  l_i: 7.0  p_i: 13.0  aI_i: 10.0  sol_a_i: 10.0  sol_g_i: 0.0  d_i: 25.0  sol_taoi: 10.0  sol_deltai: 29.0  sol_deltai - sol_taoi: 19.0  sol_taoP: 10.0  sol_deltaP: 17.0  sol_deltaP - sol_taoP: 7.0  cI_i: 4978701.0  sol_c_i: 4978701.0  sol_gp_i: 0.0  total work: 5009236.0  wasted work: 0.11581905903415211
    i: 2.0  l_i: 6.0  p_i: 9.0  aI_i: 61.0  sol_a_i: 61.0  sol_g_i: 0.0  d_i: 69.0  sol_taoi: 67.0  sol_deltai: 77.0  sol_deltai - sol_taoi: 10.0  sol_taoP: 67.0  sol_deltaP: 69.0  sol_deltaP - sol_taoP: 2.0  cI_i: 2609475.0  sol_c_i: 2609475.0  sol_gp_i: 0.0  total work: 2636440.0  wasted work: 0.10227807194550227
    i: 3.0  l_i: 7.0  p_i: 15.0  aI_i: 68.0  sol_a_i: 68.0  sol_g_i: 0.0  d_i: 78.0  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: 3252602.0  sol_c_i: 3252602.0  sol_gp_i: 0.0  total work: 4086482.0  wasted work: 3.162901488370682
    i: 4.0  l_i: 7.0  p_i: -0.0  aI_i: 8.0  sol_a_i: 8.0  sol_g_i: 0.0  d_i: 25.0  sol_taoi: 8.0  sol_deltai: 30.0  sol_deltai - sol_taoi: 22.0  sol_taoP: 8.0  sol_deltaP: 14.0  sol_deltaP - sol_taoP: 6.0  cI_i: 5706853.0  sol_c_i: 5706853.0  sol_gp_i: 0.0  total work: 5800168.0  wasted work: 0.35394319612811215
    i: 5.0  l_i: 4.0  p_i: 5.0  aI_i: 52.0  sol_a_i: 52.0  sol_g_i: 0.0  d_i: 60.0  sol_taoi: 52.0  sol_deltai: 62.0  sol_deltai - sol_taoi: 10.0  sol_taoP: 52.0  sol_deltaP: 56.0  sol_deltaP - sol_taoP: 4.0  cI_i: 2467067.0  sol_c_i: 2467067.0  sol_gp_i: 0.0  total work: 2636440.0  wasted work: 0.6424307020072522
    i: 6.0  l_i: 6.0  p_i: 16.0  aI_i: 55.0  sol_a_i: 55.0  sol_g_i: 0.0  d_i: 64.0  sol_taoi: 55.0  sol_deltai: 67.0  sol_deltai - sol_taoi: 12.0  sol_taoP: 55.0  sol_deltaP: 60.0  sol_deltaP - sol_taoP: 5.0  cI_i: 2907714.0  sol_c_i: 2907714.0  sol_gp_i: 0.0  total work: 3031906.0  wasted work: 0.47105945896739543
    i: 7.0  l_i: 7.0  p_i: 9.0  aI_i: 55.0  sol_a_i: 55.0  sol_g_i: 0.0  d_i: 63.0  sol_taoi: 55.0  sol_deltai: 66.0  sol_deltai - sol_taoi: 11.0  sol_taoP: 55.0  sol_deltaP: 57.0  sol_deltaP - sol_taoP: 2.0  cI_i: 2846771.0  sol_c_i: 2846771.0  sol_gp_i: 0.0  total work: 3031906.0  wasted work: 0.7022158668507533
    i: 8.0  l_i: 4.0  p_i: 24.0  aI_i: 14.0  sol_a_i: 14.0  sol_g_i: 0.0  d_i: 23.0  sol_taoi: 14.0  sol_deltai: 26.0  sol_deltai - sol_taoi: 12.0  sol_taoP: 14.0  sol_deltaP: 19.0  sol_deltaP - sol_taoP: 5.0  cI_i: 3076476.0  sol_c_i: 3076476.0  sol_gp_i: 0.0  total work: 3295550.0  wasted work: 0.8309462760389009
    i: 9.0  l_i: 6.0  p_i: 7.0  aI_i: 20.0  sol_a_i: 20.0  sol_g_i: 0.0  d_i: 32.0  sol_taoi: 20.0  sol_deltai: 35.0  sol_deltai - sol_taoi: 15.0  sol_taoP: 20.0  sol_deltaP: 23.0  sol_deltaP - sol_taoP: 3.0  cI_i: 3763537.0  sol_c_i: 3763537.0  sol_gp_i: 0.0  total work: 3954660.0  wasted work: 0.7249283124212954
    i: 10.0  l_i: 5.0  p_i: -0.0  aI_i: 61.0  sol_a_i: 61.0  sol_g_i: 0.0  d_i: 81.0  sol_taoi: 61.0  sol_deltai: 87.0  sol_deltai - sol_taoi: 26.0  sol_taoP: 61.0  sol_deltaP: 74.0  sol_deltaP - sol_taoP: 13.0  cI_i: 6682708.0  sol_c_i: 6682708.0  sol_gp_i: 0.0  total work: 6854744.0  wasted work: 0.6525314439167968
    i: 11.0  l_i: 5.0  p_i: 7.0  aI_i: 3.0  sol_a_i: 4.0  sol_g_i: 0.2  d_i: 16.0  sol_taoi: 4.0  sol_deltai: 17.0  sol_deltai - sol_taoi: 13.0  sol_taoP: 4.0  sol_deltaP: 7.0  sol_deltaP - sol_taoP: 3.0  cI_i: 3300620.0  sol_c_i: 3300620.0  sol_gp_i: 0.0  total work: 3559194.0  wasted work: 0.9807695225379679
    i: 12.0  l_i: 6.0  p_i: 28.0  aI_i: 5.0  sol_a_i: 13.0  sol_g_i: 1.0  d_i: 16.0  sol_taoi: 13.0  sol_deltai: 23.0  sol_deltai - sol_taoi: 10.0  sol_taoP: 13.0  sol_deltaP: 17.0  sol_deltaP - sol_taoP: 4.0  cI_i: 2561279.0  sol_c_i: 4406787.0  sol_gp_i: 1.0  total work: 4481948.0  wasted work: 0.28508519063585747
    i: 13.0  l_i: 5.0  p_i: 22.0  aI_i: 66.0  sol_a_i: 72.0  sol_g_i: 0.6  d_i: 80.0  sol_taoi: 72.0  sol_deltai: 88.0  sol_deltai - sol_taoi: 16.0  sol_taoP: 72.0  sol_deltaP: 76.0  sol_deltaP - sol_taoP: 4.0  cI_i: 4198407.0  sol_c_i: 4198407.0  sol_gp_i: 0.0  total work: 4218304.0  wasted work: 0.07546919330612492
    i: 14.0  l_i: 6.0  p_i: 5.0  aI_i: 31.0  sol_a_i: 35.2  sol_g_i: 0.6  d_i: 41.0  sol_taoi: 36.0  sol_deltai: 46.0  sol_deltai - sol_taoi: 10.0  sol_taoP: 36.0  sol_deltaP: 39.0  sol_deltaP - sol_taoP: 3.0  cI_i: 2558189.0  sol_c_i: 2558189.0  sol_gp_i: 0.0  total work: 2636440.0  wasted work: 0.29680554080502497
    i: 15.0  l_i: 7.0  p_i: 27.0  aI_i: 58.0  sol_a_i: 58.0  sol_g_i: 0.0  d_i: 78.0  sol_taoi: 58.0  sol_deltai: 76.0  sol_deltai - sol_taoi: 18.0  sol_taoP: 58.0  sol_deltaP: 65.0  sol_deltaP - sol_taoP: 7.0  cI_i: 4501830.0  sol_c_i: 6610982.0  sol_gp_i: 1.0  total work: 6722922.0  wasted work: 0.4245877015976089
    i: 16.0  l_i: 5.0  p_i: 29.0  aI_i: 20.0  sol_a_i: 26.0  sol_g_i: 1.0  d_i: 36.0  sol_taoi: 26.0  sol_deltai: 47.0  sol_deltai - sol_taoi: 21.0
```

```
sol_taoP: 26.0 sol_deltaP: 34.0 sol_deltaP - sol_taoP: 8.0 cl_i: 5454578.0 sol_c_i: 6772798.0 sol_gp_i: 1.0 total work: 7382032.0 wasted work : 2.3108206520914565
    i: 17.0 l_i: 5.0 p_i: 22.0 al_i: 49.0 sol_a_i: 54.4 sol_g_i: 0.6 d_i: 66.0 sol_taoi: 55.0 sol_deltai: 70.0 sol_deltai - sol_taoi: 15.0 sol_taoP: 55.0 sol_deltaP: 61.0 sol_deltaP - sol_taoP: 6.0 cl_i: 3792467.0 sol_c_i: 5901619.0 sol_gp_i: 1.0 total work: 5931990.0 wasted work : 0.11519700808666232

Optimal objective = 1777.0

Time: 1290.000000
```