```
"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=38756

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

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 _□□□□/4 □□□□/3 python_code/9 Code for this paper/main_RO_BDC.py', wdir='E:/1 □□□□/3 □□□□□/1 □□□□□□□/1 □□□□□□□□□/1_□□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper')
Backend TkAgg is interactive backend. Turning interactive mode on.
Waiting 5s.....

Optimize the  ./R_12_1.xlsx  instance by BDC

        Master protblem status =  2 , is Optimal
        sol_MP_obj =  451.0
The initial lb =  -inf        ub =  inf

The current iteration cnt =  0
        Dual problem status =  2 , is Optimal
        Add optimal cut
        Master protblem status =  2 , is Optimal
        Deterministic Sub problem Status=  2 , is Optimal
        lb =  481.20608842105696                ub =  481.20608842105696
        MPObj =  481.20608842105696        MPObj_Remove_Hua =  475.0        DualSPObj =  6.206088421056954        Hua =  6.206088421056954        Deterministic_SP_SPObj =  340.0

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:  14.0  aI_i:  2.0  sol_a_i:  2.0  sol_g_i:  0.0  d_i:  14.0  sol_taoi:  2.0  sol_deltai:  21.0  sol_deltai - sol_taoi:  19.0  sol_taoP:  2.0  sol_deltaP:  6.0  sol_deltaP - sol_taoP:  4.0  cI_i:  4827990.0  sol_c_i:  4827990.0  sol_gp_i:  0.0  total work:  5009236.0  wasted work:  0.6874649148093641
    i:  1.0  l_i:  7.0  p_i:  20.0  aI_i:  5.0  sol_a_i:  5.0  sol_g_i:  0.0  d_i:  15.0  sol_taoi:  5.0  sol_deltai:  21.0  sol_deltai - sol_taoi:  16.0  sol_taoP:  5.0  sol_deltaP:  9.0  sol_deltaP - sol_taoP:  4.0  cI_i:  3973929.0  sol_c_i:  3973929.0  sol_gp_i:  0.0  total work:  4086482.0  wasted work:  0.42691280666353115
    i:  2.0  l_i:  7.0  p_i:  7.0  aI_i:  9.0  sol_a_i:  9.0  sol_g_i:  0.0  d_i:  24.0  sol_taoi:  9.0  sol_deltai:  34.0  sol_deltai - sol_taoi:  25.0  sol_taoP:  9.0  sol_deltaP:  14.0  sol_deltaP - sol_taoP:  5.0  cI_i:  6489910.0  sol_c_i:  6489910.0  sol_gp_i:  0.0  total work:  6591100.0  wasted work:  0.3838130205883692
    i:  3.0  l_i:  6.0  p_i:  27.0  aI_i:  10.0  sol_a_i:  10.0  sol_g_i:  0.0  d_i:  14.0  sol_taoi:  10.0  sol_deltai:  14.0  sol_deltai - sol_taoi:  4.0  sol_taoP:  10.0  sol_deltaP:  12.0  sol_deltaP - sol_taoP:  2.0  cI_i:  1036688.0  sol_c_i:  1036688.0  sol_gp_i:  0.0  total work:  1845508.0  wasted work:  3.067849069199375
    i:  4.0  l_i:  7.0  p_i:  0.0  aI_i:  13.0  sol_a_i:  13.0  sol_g_i:  0.0  d_i:  18.0  sol_taoi:  13.0  sol_deltai:  18.0  sol_deltai - sol_taoi:  5.0  sol_taoP:  13.0  sol_deltaP:  16.0  sol_deltaP - sol_taoP:  3.0  cI_i:  1300263.0  sol_c_i:  1300263.0  sol_gp_i:  0.0  total work:  1318220.0  wasted work:  0.0681107857565505
    i:  5.0  l_i:  5.0  p_i:  14.0  aI_i:  22.0  sol_a_i:  22.0  sol_g_i:  0.0  d_i:  27.0  sol_taoi:  22.0  sol_deltai:  29.0  sol_deltai - sol_taoi:  7.0  sol_taoP:  22.0  sol_deltaP:  24.0  sol_deltaP - sol_taoP:  2.0  cI_i:  1714644.0  sol_c_i:  1714644.0  sol_gp_i:  0.0  total work:  1845508.0  wasted work:  0.4963663121481998
    i:  6.0  l_i:  5.0  p_i:  20.0  aI_i:  23.0  sol_a_i:  27.0  sol_g_i:  0.8  d_i:  33.0  sol_taoi:  27.0  sol_deltai:  32.0  sol_deltai - sol_taoi:  5.0  sol_taoP:  27.0  sol_deltaP:  29.0  sol_deltaP - sol_taoP:  2.0  cI_i:  1171409.0  sol_c_i:  2436900.2  sol_gp_i:  0.8  total work:  3163728.0  wasted work:  2.756853180804417
    i:  7.0  l_i:  6.0  p_i:  0.0  aI_i:  27.0  sol_a_i:  30.2  sol_g_i:  0.4  d_i:  60.0  sol_taoi:  31.0  sol_deltai:  60.0  sol_deltai - sol_taoi:  29.0  sol_taoP:  31.0  sol_deltaP:  39.0  sol_deltaP - sol_taoP:  8.0  cI_i:  7632041.0  sol_c_i:  7632041.0  sol_gp_i:  0.0  total work:  8172964.0  wasted work:  2.051717467494045
    i:  8.0  l_i:  6.0  p_i:  14.0  aI_i:  30.0  sol_a_i:  30.0  sol_g_i:  0.0  d_i:  70.0  sol_taoi:  30.0  sol_deltai:  65.0  sol_deltai - sol_taoi:  35.0  sol_taoP:  30.0  sol_deltaP:  37.0  sol_deltaP - sol_taoP:  7.0  cI_i:  8969412.0  sol_c_i:  9602157.6  sol_gp_i:  0.6  total work:  9754828.0  wasted work:  0.5790778474002836
    i:  9.0  l_i:  6.0  p_i:  6.0  aI_i:  34.0  sol_a_i:  41.0  sol_g_i:  1.0  d_i:  60.0  sol_taoi:  41.0  sol_deltai:  63.0  sol_deltai - sol_taoi:  22.0  sol_taoP:  41.0  sol_deltaP:  48.0  sol_deltaP - sol_taoP:  7.0  cI_i:  5766334.0  sol_c_i:  7611842.0  sol_gp_i:  1.0  total work:  7645676.0  wasted work:  0.1283321448620109
    i:  10.0  l_i:  7.0  p_i:  20.0  aI_i:  43.0  sol_a_i:  45.8  sol_g_i:  0.4  d_i:  55.0  sol_taoi:  46.0  sol_deltai:  51.0  sol_deltai - sol_taoi:  5.0  sol_taoP:  46.0  sol_deltaP:  47.0  sol_deltaP - sol_taoP:  1.0  cI_i:  1218429.0  sol_c_i:  1323886.6  sol_gp_i:  0.2  total work:  1450042.0  wasted work:  0.47850662256679427
    i:  11.0  l_i:  6.0  p_i:  20.0  aI_i:  50.0  sol_a_i:  56.0  sol_g_i:  1.0  d_i:  63.0  sol_taoi:  56.0  sol_deltai:  67.0  sol_deltai - sol_taoi:  11.0  sol_taoP:  56.0  sol_deltaP:  59.0  sol_deltaP - sol_taoP:  3.0  cI_i:  2724812.0  sol_c_i:  4043032.0  sol_gp_i:  1.0  total work:  4218304.0  wasted work:  0.6648055711489737

Optimal objective =  815.0

Time: 100.000000
```