```
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=26062

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_16_3.xlsx  instance by BDC

        Master protblem status =  2 , is Optimal
        sol_MP_obj =  741.0
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 =  785.9521882505909                 ub =  785.9521882505909
        MPObj =  785.9521882505909      MPObj_Remove_Hua =  775.0       DualSPObj =  10.952188250590913      Hua =  10.952188250590911      Deterministic_SP_SPObj =  582.0

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: 7.0   p_i: 13.0   al_i: 48.0      sol_a_i: 48.0  sol_g_i: 0.0   d_i: 71.0    sol_taoi: 48.0    sol_deltai: 71.0  sol_deltai - sol_taoi: 23.0  sol_taoP: 48.0  sol_deltaP: 54.0    sol_deltaP - sol_taoP: 6.0  cl_i: 5990533.0     sol_c_i: 5990533.0    sol_gp_i: 0.0  total work: 6063812.0    wasted work: 0.2779467767140538
    i: 1.0  l_i: 6.0   p_i: 7.0   al_i: 55.0      sol_a_i: 55.0  sol_g_i: 0.0   d_i: 66.0    sol_taoi: 55.0    sol_deltai: 66.0  sol_deltai - sol_taoi: 11.0  sol_taoP: 55.0    sol_deltaP: 58.0    sol_deltaP - sol_taoP: 3.0  cl_i: 2692567.0     sol_c_i: 2692567.0    sol_gp_i: 0.0  total work: 2768262.0    wasted work: 0.28711064920878154
    i: 2.0  l_i: 5.0   p_i: 22.0   al_i: 0.0       sol_a_i: 0.0   sol_g_i: 0.0   d_i: 17.0    sol_taoi: 0.0     sol_deltai: 17.0  sol_deltai - sol_taoi: 17.0  sol_taoP: -0.0    sol_deltaP: 4.0   sol_deltaP - sol_taoP: 4.0   cl_i: 4304071.0     sol_c_i: 4304071.0    sol_gp_i: 0.0  total work: 5272880.0    wasted work: 3.6746863194307475
    i: 3.0  l_i: 6.0   p_i: 11.0   al_i: 33.0      sol_a_i: 33.0  sol_g_i: 0.0   d_i: 47.0    sol_taoi: 33.0    sol_deltai: 47.0  sol_deltai - sol_taoi: 14.0  sol_taoP: 33.0  sol_deltaP: 35.0    sol_deltaP - sol_taoP: 2.0  cl_i: 3526398.0     sol_c_i: 3526398.0    sol_gp_i: 0.0  total work: 3691016.0    wasted work: 0.6243950175236304
    i: 4.0  l_i: 5.0   p_i: 12.0   al_i: 4.0       sol_a_i: 4.0   sol_g_i: 0.0   d_i: 16.0    sol_taoi: 4.0     sol_deltai: 16.0  sol_deltai - sol_taoi: 12.0  sol_taoP: 4.0     sol_deltaP: 6.0   sol_deltaP - sol_taoP: 2.0  cl_i: 3081848.0     sol_c_i: 3081848.0    sol_gp_i: 0.0  total work: 3163728.0    wasted work: 0.31057031451502787
    i: 5.0  l_i: 6.0   p_i: 0.0   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: 7.0   sol_deltaP - sol_taoP: 5.0  cl_i: 3373824.0     sol_c_i: 3373824.0    sol_gp_i: 0.0  total work: 3427372.0    wasted work: 0.2031072203425832
    i: 6.0  l_i: 7.0   p_i: 0.0   al_i: 17.0      sol_a_i: 17.0  sol_g_i: 0.0   d_i: 44.0    sol_taoi: 17.0    sol_deltai: 44.0  sol_deltai - sol_taoi: 27.0  sol_taoP: 17.0    sol_deltaP: 25.0    sol_deltaP - sol_taoP: 8.0  cl_i: 6908643.0     sol_c_i: 6908643.0    sol_gp_i: 0.0  total work: 7382032.0    wasted work: 1.7955614389100454
    i: 7.0  l_i: 4.0   p_i: 20.0   al_i: 63.0      sol_a_i: 63.0  sol_g_i: 0.0   d_i: 75.0    sol_taoi: 63.0    sol_deltai: 75.0  sol_deltai - sol_taoi: 12.0  sol_taoP: 63.0  sol_deltaP: 65.0    sol_deltaP - sol_taoP: 2.0  cl_i: 2932992.0     sol_c_i: 2932992.0    sol_gp_i: 0.0  total work: 3163728.0    wasted work: 0.8751801671951571
    i: 8.0  l_i: 5.0   p_i: 27.0   al_i: 16.0      sol_a_i: 16.0  sol_g_i: 0.0   d_i: 43.0    sol_taoi: 16.0    sol_deltai: 43.0  sol_deltai - sol_taoi: 27.0  sol_taoP: 16.0  sol_deltaP: 22.0    sol_deltaP - sol_taoP: 6.0  cl_i: 6964934.0     sol_c_i: 6964934.0    sol_gp_i: 0.0  total work: 7118388.0    wasted work: 0.5820500371713371
    i: 9.0  l_i: 5.0   p_i: 17.0   al_i: 4.0       sol_a_i: 4.0   sol_g_i: 0.0   d_i: 21.0    sol_taoi: 4.0     sol_deltai: 20.0  sol_deltai - sol_taoi: 16.0  sol_taoP: 4.0     sol_deltaP: 10.0    sol_deltaP - sol_taoP: 6.0  cl_i: 4081375.0     sol_c_i: 5346866.2    sol_gp_i: 0.8  total work: 5536524.0    wasted work: 0.7193708182245748
    i: 10.0   l_i: 5.0   p_i: 7.0   al_i: 7.0       sol_a_i: 13.4  sol_g_i: 0.8   d_i: 32.0    sol_taoi: 14.0    sol_deltai: 32.0  sol_deltai - sol_taoi: 18.0  sol_taoP: 14.0  sol_deltaP: 18.0    sol_deltaP - sol_taoP: 4.0  cl_i: 4628706.0     sol_c_i: 4628706.0    sol_gp_i: 0.0  total work: 4745592.0    wasted work: 0.4433478478554414
    i: 11.0   l_i: 4.0   p_i: 0.0   al_i: 62.0      sol_a_i: 72.0  sol_g_i: 1.0   d_i: 83.0    sol_taoi: 72.0    sol_deltai: 92.0  sol_deltai - sol_taoi: 20.0  sol_taoP: 72.0  sol_deltaP: 79.0    sol_deltaP - sol_taoP: 7.0  cl_i: 5146195.0     sol_c_i: 5357110.2    sol_gp_i: 0.2  total work: 5536524.0    wasted work: 0.6805153919679561
    i: 12.0   l_i: 4.0   p_i: 7.0   al_i: 28.0      sol_a_i: 32.2  sol_g_i: 0.6   d_i: 40.0    sol_taoi: 33.0    sol_deltai: 42.0  sol_deltai - sol_taoi: 9.0   sol_taoP: 33.0  sol_deltaP: 39.0    sol_deltaP - sol_taoP: 6.0  cl_i: 2133316.0     sol_c_i: 3978824.0    sol_gp_i: 1.0  total work: 4218304.0    wasted work: 0.9083461030783936
    i: 13.0   l_i: 6.0   p_i: 24.0   al_i: 39.0      sol_a_i: 43.2  sol_g_i: 0.6   d_i: 70.0    sol_taoi: 44.0    sol_deltai: 69.0  sol_deltai - sol_taoi: 25.0  sol_taoP: 44.0    sol_deltaP: 48.0    sol_deltaP - sol_taoP: 4.0  cl_i: 6461896.0     sol_c_i: 6461896.0    sol_gp_i: 0.0  total work: 6854744.0    wasted work: 1.4900699428016568
    i: 14.0   l_i: 7.0   p_i: 0.0   al_i: 43.0      sol_a_i: 46.6  sol_g_i: 0.6   d_i: 63.0    sol_taoi: 47.0    sol_deltai: 66.0  sol_deltai - sol_taoi: 19.0  sol_taoP: 47.0  sol_deltaP: 59.0    sol_deltaP - sol_taoP: 12.0    cl_i: 4833331.0     sol_c_i: 6151551.0    sol_gp_i: 1.0  total work: 6327456.0    wasted work: 0.6672065360865409
    i: 15.0   l_i: 4.0   p_i: 20.0   al_i: 40.0      sol_a_i: 43.6  sol_g_i: 0.4   d_i: 60.0    sol_taoi: 44.0    sol_deltai: 60.0  sol_deltai - sol_taoi: 16.0  sol_taoP: 44.0    sol_deltaP: 53.0    sol_deltaP - sol_taoP: 9.0  cl_i: 4101707.0     sol_c_i: 6210859.0    sol_gp_i: 1.0  total work: 6327456.0    wasted work: 0.4422516727101698

```

```
Optimal objective =  1357.0

Time: 1368.000000
```