```
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=32332

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_1.xlsx  instance by BDC

        Master protblem status =  2 , is Optimal
        sol_MP_obj =  915.0
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 =  954.2538361630332                ub =  954.2538361630332
        MPObj =  954.2538361630332      MPObj_Remove_Hua =  944.0      DualSPObj =  10.253836163033185      Hua =  10.25383616303319      Deterministic_SP_SPObj =  776.0

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: -0.0    aI_i: 1.0       sol_a_i: 1.0   sol_g_i: 0.0   d_i: 28.0    sol_taoi: 1.0   sol_deltai: 28.0  sol_deltai - sol_taoi: 27.0  sol_taoP: 1.0    sol_deltaP: 16.0    sol_deltaP - sol_taoP: 15.0    cI_i: 6937615.0     sol_c_i: 6937615.0    sol_gp_i: 0.0  total work: 7118388.0    wasted work: 0.6856708288449576
    i: 1.0  l_i: 4.0   p_i: 7.0   aI_i: 27.0      sol_a_i: 27.0  sol_g_i: 0.0   d_i: 42.0    sol_taoi: 27.0    sol_deltai: 42.0  sol_deltai - sol_taoi: 15.0  sol_taoP: 27.0    sol_deltaP: 35.0    sol_deltaP - sol_taoP: 8.0   cI_i: 3708800.0     sol_c_i: 3708800.0    sol_gp_i: 0.0  total work: 3954660.0    wasted work: 0.9325454021331796
    i: 2.0  l_i: 5.0   p_i: 7.0   aI_i: 13.0      sol_a_i: 13.0  sol_g_i: 0.0   d_i: 22.0    sol_taoi: 13.0    sol_deltai: 22.0  sol_deltai - sol_taoi: 9.0    sol_taoP: 13.0    sol_deltaP: 15.0    sol_deltaP - sol_taoP: 2.0   cI_i: 2263831.0     sol_c_i: 2263831.0    sol_gp_i: 0.0  total work: 2372796.0    wasted work: 0.4133035456904007
    i: 3.0  l_i: 6.0   p_i: 20.0    aI_i: 58.0      sol_a_i: 58.0  sol_g_i: 0.0   d_i: 69.0    sol_taoi: 58.0    sol_deltai: 69.0  sol_deltai - sol_taoi: 11.0  sol_taoP: 58.0  sol_deltaP: 62.0    sol_deltaP - sol_taoP: 4.0   cI_i: 2796726.0     sol_c_i: 2796726.0    sol_gp_i: 0.0  total work: 2900084.0    wasted work: 0.39203623067469767
    i: 4.0  l_i: 7.0   p_i: 20.0    aI_i: 41.0      sol_a_i: 41.0  sol_g_i: 0.0   d_i: 56.0    sol_taoi: 41.0    sol_deltai: 56.0  sol_deltai - sol_taoi: 15.0  sol_taoP: 41.0  sol_deltaP: 43.0    sol_deltaP - sol_taoP: 2.0   cI_i: 3873618.0     sol_c_i: 3873618.0    sol_gp_i: 0.0  total work: 3954660.0    wasted work: 0.3073917858930983
    i: 5.0  l_i: 7.0   p_i: 8.0   aI_i: 49.0      sol_a_i: 49.0  sol_g_i: 0.0   d_i: 58.0    sol_taoi: 49.0    sol_deltai: 58.0  sol_deltai - sol_taoi: 9.0    sol_taoP: 49.0    sol_deltaP: 53.0    sol_deltaP - sol_taoP: 4.0   cI_i: 2367917.0     sol_c_i: 2367917.0    sol_gp_i: 0.0  total work: 2504618.0    wasted work: 0.5185060156878215
    i: 6.0  l_i: 5.0   p_i: 15.0    aI_i: 55.0      sol_a_i: 55.0  sol_g_i: 0.0   d_i: 72.0    sol_taoi: 55.0    sol_deltai: 72.0  sol_deltai - sol_taoi: 17.0  sol_taoP: 55.0  sol_deltaP: 58.0    sol_deltaP - sol_taoP: 3.0   cI_i: 4410361.0     sol_c_i: 4410361.0    sol_gp_i: 0.0  total work: 4481948.0    wasted work: 0.27152903157287855
    i: 7.0  l_i: 7.0   p_i: 13.0    aI_i: 24.0      sol_a_i: 24.0  sol_g_i: 0.0   d_i: 46.0    sol_taoi: 24.0    sol_deltai: 46.0  sol_deltai - sol_taoi: 22.0  sol_taoP: 24.0  sol_deltaP: 31.0    sol_deltaP - sol_taoP: 7.0   cI_i: 5629341.0     sol_c_i: 5629341.0    sol_gp_i: 0.0  total work: 5668346.0    wasted work: 0.14794571467585077
    i: 8.0  l_i: 4.0   p_i: 11.0    aI_i: 59.0      sol_a_i: 59.0  sol_g_i: 0.0   d_i: 75.0    sol_taoi: 59.0    sol_deltai: 75.0  sol_deltai - sol_taoi: 16.0  sol_taoP: 59.0  sol_deltaP: 63.0    sol_deltaP - sol_taoP: 4.0   cI_i: 4065792.0     sol_c_i: 4065792.0    sol_gp_i: 0.0  total work: 4086482.0    wasted work: 0.07847703721685304
    i: 9.0  l_i: 6.0   p_i: -0.0    aI_i: 28.0      sol_a_i: 29.0  sol_g_i: 0.2   d_i: 39.0    sol_taoi: 29.0    sol_deltai: 39.0  sol_deltai - sol_taoi: 10.0  sol_taoP: 29.0  sol_deltaP: 37.0    sol_deltaP - sol_taoP: 8.0   cI_i: 2602059.0     sol_c_i: 3867550.2    sol_gp_i: 0.8  total work: 3954660.0    wasted work: 0.3304069123515036
    i: 10.0   l_i: 7.0   p_i: 20.0    aI_i: 21.0      sol_a_i: 29.0  sol_g_i: 1.0   d_i: 33.0    sol_taoi: 29.0    sol_deltai: 39.0  sol_deltai - sol_taoi: 10.0  sol_taoP: 29.0    sol_deltaP: 32.0    sol_deltaP - sol_taoP: 3.0   cI_i: 2596063.0     sol_c_i: 2596063.0    sol_gp_i: 0.0  total work: 2768262.0    wasted work: 0.6531497018707044
    i: 11.0   l_i: 6.0   p_i: 20.0    aI_i: 65.0      sol_a_i: 71.0  sol_g_i: 0.6   d_i: 78.0    sol_taoi: 71.0    sol_deltai: 83.0  sol_deltai - sol_taoi: 12.0  sol_taoP: 71.0    sol_deltaP: 74.0    sol_deltaP - sol_taoP: 3.0   cI_i: 3003110.0     sol_c_i: 3214025.2    sol_gp_i: 0.2  total work: 4745592.0    wasted work: 5.80922304319461
    i: 12.0   l_i: 7.0   p_i: 27.0    aI_i: 41.0      sol_a_i: 45.2  sol_g_i: 0.6   d_i: 61.0    sol_taoi: 46.0    sol_deltai: 66.0  sol_deltai - sol_taoi: 20.0  sol_taoP: 46.0    sol_deltaP: 52.0    sol_deltaP - sol_taoP: 6.0   cI_i: 5118817.0     sol_c_i: 6964325.0    sol_gp_i: 1.0  total work: 7118388.0    wasted work: 0.5843599702629303
    i: 13.0   l_i: 7.0   p_i: 4.0   aI_i: 59.0      sol_a_i: 59.0  sol_g_i: 0.0   d_i: 83.0    sol_taoi: 59.0    sol_deltai: 86.0  sol_deltai - sol_taoi: 27.0  sol_taoP: 59.0  sol_deltaP: 71.0    sol_deltaP - sol_taoP: 12.0    cI_i: 6861506.0     sol_c_i: 6861506.0    sol_gp_i: 0.0  total work: 7118388.0    wasted work: 0.9743517773967927
    i: 14.0   l_i: 7.0   p_i: 27.0    aI_i: 59.0      sol_a_i: 62.6  sol_g_i: 0.6   d_i: 79.0    sol_taoi: 67.0    sol_deltai: 87.0  sol_deltai - sol_taoi: 20.0  sol_taoP: 67.0    sol_deltaP: 72.0    sol_deltaP - sol_taoP: 5.0   cI_i: 5115184.0     sol_c_i: 6433404.0    sol_gp_i: 1.0  total work: 6591100.0    wasted work: 0.5981399159472622
    i: 15.0   l_i: 4.0   p_i: -0.0    aI_i: 42.0      sol_a_i: 51.0  sol_g_i: 1.0   d_i: 76.0    sol_taoi: 51.0    sol_deltai: 76.0  sol_deltai - sol_taoi: 25.0  sol_taoP: 51.0    sol_deltaP: 62.0    sol_deltaP - sol_taoP: 11.0    cI_i: 6356645.0     sol_c_i: 8465797.0    sol_gp_i: 1.0  total work: 8700252.0    wasted work: 0.8892863103275629

```

```
Optimal objective =  1720.0

Time: 1508.000000
```