```
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=6994

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_13_3.xlsx  instance by BDC

        Master protblem status =  2 , is Optimal
        sol_MP_obj =  566.0
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 =  596.9057650249454                 ub =  596.9057650249454
        MPObj =  596.9057650249454      MPObj_Remove_Hua =  590.0       DualSPObj =  6.905765024945418        Hua =  6.905765024945418        Deterministic_SP_SPObj =  451.0

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: 1.0       sol_a_i: 1.0    sol_g_i: 0.0    d_i: 14.0    sol_taoi: 1.0    sol_deltai: 15.0    sol_deltai - sol_taoi: 14.0    sol_taoP: 1.0    sol_deltaP: 6.0    sol_deltaP - sol_taoP: 5.0    cl_i: 3687371.0     sol_c_i: 3687371.0    sol_gp_i: 0.0    total work: 3691016.0    wasted work: 0.01382546160731896
    i: 1.0  l_i: 6.0    p_i: 5.0    aI_i: 5.0       sol_a_i: 5.0    sol_g_i: 0.0    d_i: 11.0    sol_taoi: 5.0    sol_deltai: 12.0    sol_deltai - sol_taoi: 7.0    sol_taoP: 5.0    sol_deltaP: 8.0    sol_deltaP - sol_taoP: 3.0    cl_i: 1678517.0     sol_c_i: 1678517.0    sol_gp_i: 0.0    total work: 1845508.0    wasted work: 0.6333957912943211
    i: 2.0  l_i: 5.0    p_i: 11.0    aI_i: 5.0       sol_a_i: 5.0    sol_g_i: 0.0    d_i: 13.0    sol_taoi: 5.0    sol_deltai: 11.0    sol_deltai - sol_taoi: 6.0    sol_taoP: 5.0    sol_deltaP: 6.0    sol_deltaP - sol_taoP: 1.0    cl_i: 1414613.0     sol_c_i: 1414613.0    sol_gp_i: 0.0    total work: 1581864.0    wasted work: 0.6343819696257074
    i: 3.0  l_i: 5.0    p_i: 11.0    aI_i: 13.0      sol_a_i: 13.0    sol_g_i: 0.0    d_i: 46.0    sol_taoi: 13.0    sol_deltai: 44.0    sol_deltai - sol_taoi: 31.0    sol_taoP: 13.0    sol_deltaP: 19.0    sol_deltaP - sol_taoP: 6.0    cl_i: 8167125.0     sol_c_i: 8167125.0    sol_gp_i: 0.0    total work: 8172964.0    wasted work: 0.022147289526786122
    i: 4.0  l_i: 5.0    p_i: 0.0    aI_i: 22.0      sol_a_i: 22.0    sol_g_i: 0.0    d_i: 31.0    sol_taoi: 22.0    sol_deltai: 34.0    sol_deltai - sol_taoi: 12.0    sol_taoP: 22.0    sol_deltaP: 27.0    sol_deltaP - sol_taoP: 5.0    cl_i: 3074214.0     sol_c_i: 3074214.0    sol_gp_i: 0.0    total work: 3163728.0    wasted work: 0.3395260275219614
    i: 5.0  l_i: 6.0    p_i: 5.0    aI_i: 23.0      sol_a_i: 23.0    sol_g_i: 0.0    d_i: 27.0    sol_taoi: 23.0    sol_deltai: 28.0    sol_deltai - sol_taoi: 5.0    sol_taoP: 23.0    sol_deltaP: 25.0    sol_deltaP - sol_taoP: 2.0    cl_i: 1267544.0     sol_c_i: 1267544.0    sol_gp_i: 0.0    total work: 1318220.0    wasted work: 0.19221374277434722
    i: 6.0  l_i: 5.0    p_i: 28.0    aI_i: 29.0      sol_a_i: 29.0    sol_g_i: 0.0    d_i: 63.0    sol_taoi: 29.0    sol_deltai: 63.0    sol_deltai - sol_taoi: 34.0    sol_taoP: 29.0    sol_deltaP: 36.0    sol_deltaP - sol_taoP: 7.0    cl_i: 8717480.0     sol_c_i: 8717480.0    sol_gp_i: 0.0    total work: 9227540.0    wasted work: 1.9346543065649133
    i: 7.0  l_i: 7.0    p_i: 0.0    aI_i: 35.0      sol_a_i: 39.0    sol_g_i: 0.8    d_i: 52.0    sol_taoi: 39.0    sol_deltai: 48.0    sol_deltai - sol_taoi: 9.0    sol_taoP: 39.0    sol_deltaP: 44.0    sol_deltaP - sol_taoP: 5.0    cl_i: 2331657.0     sol_c_i: 3597148.2    sol_gp_i: 0.8    total work: 3954660.0    wasted work: 1.3560399629803819
    i: 8.0  l_i: 5.0    p_i: 10.0    aI_i: 43.0      sol_a_i: 46.2    sol_g_i: 0.4    d_i: 61.0    sol_taoi: 47.0    sol_deltai: 59.0    sol_deltai - sol_taoi: 12.0    sol_taoP: 47.0    sol_deltaP: 51.0    sol_deltaP - sol_taoP: 4.0    cl_i: 2973158.0     sol_c_i: 3394988.4    sol_gp_i: 0.4    total work: 3691016.0    wasted work: 1.1228307869703087
    i: 9.0  l_i: 7.0    p_i: 15.0    aI_i: 45.0      sol_a_i: 45.0    sol_g_i: 0.0    d_i: 82.0    sol_taoi: 45.0    sol_deltai: 71.0    sol_deltai - sol_taoi: 26.0    sol_taoP: 45.0    sol_deltaP: 50.0    sol_deltaP - sol_taoP: 5.0    cl_i: 6761039.0     sol_c_i: 6971954.2    sol_gp_i: 0.2    total work: 7909320.0    wasted work: 3.5554224636251908
    i: 10.0    l_i: 5.0    p_i: 0.0    aI_i: 46.0      sol_a_i: 53.0    sol_g_i: 1.0    d_i: 58.0    sol_taoi: 53.0    sol_deltai: 59.0    sol_deltai - sol_taoi: 6.0    sol_taoP: 53.0    sol_deltaP: 57.0    sol_deltaP - sol_taoP: 4.0    cl_i: 1433341.0     sol_c_i: 3278849.0    sol_gp_i: 1.0    total work: 3427372.0    wasted work: 0.5633467858172384
    i: 11.0    l_i: 5.0    p_i: 5.0    aI_i: 49.0      sol_a_i: 51.8    sol_g_i: 0.4    d_i: 73.0    sol_taoi: 52.0    sol_deltai: 69.0    sol_deltai - sol_taoi: 17.0    sol_taoP: 52.0    sol_deltaP: 61.0    sol_deltaP - sol_taoP: 9.0    cl_i: 4290124.0     sol_c_i: 4395581.6    sol_gp_i: 0.2    total work: 4481948.0    wasted work: 0.32758720092245747
    i: 12.0    l_i: 6.0    p_i: 22.0    aI_i: 50.0      sol_a_i: 56.0    sol_g_i: 1.0    d_i: 81.0    sol_taoi: 56.0    sol_deltai: 77.0    sol_deltai - sol_taoi: 21.0    sol_taoP: 56.0    sol_deltaP: 61.0    sol_deltaP - sol_taoP: 5.0    cl_i: 5286360.0     sol_c_i: 6604580.0    sol_gp_i: 1.0    total work: 6722922.0    wasted work: 0.4488704465112045

Optimal objective =  1041.0

Time: 581.000000
```