```
"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=10140

import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['E:\\1 □□□□\\3 □□□□□□\\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_14_1.xlsx  instance by BDC

        Master protblem status =  2 , is Optimal
        sol_MP_obj =  549.0
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 =  585.1177932297262                ub =  585.1177932297262
        MPObj =  585.1177932297262      MPObj_Remove_Hua =  581.0       DualSPObj =  4.117793229726179        Hua =  4.117793229726179        Deterministic_SP_SPObj =  490.0

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:  19.0    al_i:  55.0       sol_a_i:  55.0  sol_g_i:  0.0    d_i:  70.0    sol_taoi:  55.0    sol_deltai:  61.0  sol_deltai - sol_taoi:  6.0    sol_taoP: 55.0  sol_deltaP:  56.0    sol_deltaP - sol_taoP:  1.0  cl_i:  1505643.0     sol_c_i:  1505643.0    sol_gp_i:  0.0  total work:  1581864.0    wasted work:  0.2891057638330476
    i:  1.0  l_i:  5.0   p_i:  13.0    al_i:  2.0        sol_a_i:  2.0   sol_g_i:  0.0    d_i:  23.0    sol_taoi:  2.0    sol_deltai:  14.0  sol_deltai - sol_taoi:  12.0   sol_taoP:  2.0    sol_deltaP:  4.0    sol_deltaP - sol_taoP:  2.0  cl_i:  2973618.0     sol_c_i:  2973618.0    sol_gp_i:  0.0  total work:  3163728.0    wasted work:  0.7210860099224712
    i:  2.0  l_i:  6.0   p_i:  0.0   al_i:  8.0        sol_a_i:  8.0   sol_g_i:  0.0    d_i:  29.0    sol_taoi:  8.0    sol_deltai:  20.0  sol_deltai - sol_taoi:  12.0   sol_taoP:  8.0    sol_deltaP:  11.0    sol_deltaP - sol_taoP:  3.0  cl_i:  2936429.0     sol_c_i:  2936429.0    sol_gp_i:  0.0  total work:  3163728.0    wasted work:  0.8621436482529472
    i:  3.0  l_i:  7.0   p_i:  6.0   al_i:  11.0       sol_a_i:  11.0  sol_g_i:  0.0    d_i:  33.0    sol_taoi:  11.0    sol_deltai:  24.0  sol_deltai - sol_taoi:  13.0   sol_taoP:  11.0    sol_deltaP:  14.0    sol_deltaP - sol_taoP:  3.0  cl_i:  3182410.0     sol_c_i:  3182410.0    sol_gp_i:  0.0  total work:  3954660.0    wasted work:  2.9291392938963146
    i:  4.0  l_i:  6.0   p_i:  13.0    al_i:  17.0       sol_a_i:  17.0  sol_g_i:  0.0    d_i:  35.0    sol_taoi:  17.0    sol_deltai:  26.0  sol_deltai - sol_taoi:  9.0    sol_taoP: 17.0  sol_deltaP:  19.0    sol_deltaP - sol_taoP:  2.0  cl_i:  2209546.0     sol_c_i:  2209546.0    sol_gp_i:  0.0  total work:  3163728.0    wasted work:  3.6192062023031055
    i:  5.0  l_i:  6.0   p_i:  0.0   al_i:  23.0       sol_a_i:  23.0  sol_g_i:  0.0    d_i:  42.0    sol_taoi:  23.0    sol_deltai:  33.0  sol_deltai - sol_taoi:  10.0   sol_taoP:  23.0    sol_deltaP:  26.0    sol_deltaP - sol_taoP:  3.0  cl_i:  2535577.0     sol_c_i:  2535577.0    sol_gp_i:  0.0  total work:  3163728.0    wasted work:  2.3825727116869717
    i:  6.0  l_i:  6.0   p_i:  12.0    al_i:  27.0       sol_a_i:  27.0  sol_g_i:  0.0    d_i:  44.0    sol_taoi:  27.0    sol_deltai:  35.0  sol_deltai - sol_taoi:  8.0    sol_taoP: 27.0  sol_deltaP:  29.0    sol_deltaP - sol_taoP:  2.0  cl_i:  1982104.0     sol_c_i:  1982104.0    sol_gp_i:  0.0  total work:  2109152.0    wasted work:  0.4818922486383153
    i:  7.0  l_i:  5.0   p_i:  7.0   al_i:  29.0       sol_a_i:  33.0  sol_g_i:  0.8    d_i:  58.0    sol_taoi:  33.0    sol_deltai:  43.0  sol_deltai - sol_taoi:  10.0   sol_taoP:  33.0    sol_deltaP:  37.0    sol_deltaP - sol_taoP:  4.0  cl_i:  2581574.0     sol_c_i:  3847065.2    sol_gp_i:  0.8  total work:  3954660.0    wasted work:  0.4081063858839944
    i:  8.0  l_i:  5.0   p_i:  18.0    al_i:  30.0       sol_a_i:  33.2  sol_g_i:  0.4    d_i:  69.0    sol_taoi:  34.0    sol_deltai:  48.0  sol_deltai - sol_taoi:  14.0   sol_taoP: 34.0  sol_deltaP:  37.0    sol_deltaP - sol_taoP:  3.0  cl_i:  3539325.0     sol_c_i:  3539325.0    sol_gp_i:  0.0  total work:  3691016.0    wasted work:  0.5753629894858218
    i:  9.0  l_i:  5.0   p_i:  12.0    al_i:  37.0       sol_a_i:  43.0  sol_g_i:  0.6    d_i:  75.0    sol_taoi:  43.0    sol_deltai:  52.0  sol_deltai - sol_taoi:  9.0    sol_taoP: 43.0  sol_deltaP:  45.0    sol_deltaP - sol_taoP:  2.0  cl_i:  2316876.0     sol_c_i:  2527791.2    sol_gp_i:  0.2  total work:  2900084.0    wasted work:  1.412104201119691
    i:  10.0   l_i:  7.0   p_i:  0.0   al_i:  38.0       sol_a_i:  42.2  sol_g_i:  0.6    d_i:  65.0    sol_taoi:  43.0    sol_deltai:  47.0  sol_deltai - sol_taoi:  4.0    sol_taoP: 43.0  sol_deltaP:  46.0    sol_deltaP - sol_taoP:  3.0  cl_i:  1000784.0     sol_c_i:  2846292.0    sol_gp_i:  1.0  total work:  2900084.0    wasted work:  0.20403271077665336
    i:  11.0   l_i:  5.0   p_i:  7.0   al_i:  46.0       sol_a_i:  46.0  sol_g_i:  0.0    d_i:  77.0    sol_taoi:  46.0    sol_deltai:  54.0  sol_deltai - sol_taoi:  8.0    sol_taoP: 46.0  sol_deltaP:  48.0    sol_deltaP - sol_taoP:  2.0  cl_i:  1874122.0     sol_c_i:  1874122.0    sol_gp_i:  0.0  total work:  2109152.0    wasted work:  0.8914672816373594
    i:  12.0   l_i:  7.0   p_i:  12.0    al_i:  49.0       sol_a_i:  52.6  sol_g_i:  0.6    d_i:  76.0    sol_taoi:  53.0    sol_deltai:  59.0  sol_deltai - sol_taoi:  6.0    sol_taoP:  53.0    sol_deltaP:  55.0    sol_deltaP - sol_taoP:  2.0  cl_i:  1383135.0     sol_c_i:  2701355.0    sol_gp_i:  1.0  total work:  3163728.0    wasted work:  1.7537778216079258
    i:  13.0   l_i:  6.0   p_i:  0.0   al_i:  50.0       sol_a_i:  59.0  sol_g_i:  1.0    d_i:  83.0    sol_taoi:  59.0    sol_deltai:  65.0  sol_deltai - sol_taoi:  6.0    sol_taoP: 59.0  sol_deltaP:  63.0    sol_deltaP - sol_taoP:  4.0  cl_i:  1355107.0     sol_c_i:  3464259.0    sol_gp_i:  1.0  total work:  4218304.0    wasted work:  2.860087845731365

Optimal objective =  1071.0

Time: 347.000000
```

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