```
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=5426
 2
 3
    import sys; print('Python %s on %s' % (sys.version, sys.platform))
     sys.path.extend(['E:\\1 ] _ _ \\3 | 0 _ _ | \\1 | 0 | 0 | 0 | \\1 | 0 | 0 | 0 | \\1 | 0 | 0 | 0 | \\1 | 0 | 0 | 0 | \\1 | 0 | 0 | 0 | \\1 | 0 | 0 | 0 | \\1 | 0 | 0 | \\1 | 0 | 0 | \\1 | 0 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\1 | 0 | \\\  | 0 | \\1 | 0 | \\\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | \\  | 0 | 
     6
     PyDev console: starting.
 8 Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC v.1929 64 bit (AMD64)] on win32
     main RO BDC.py', wdir='E:/1 0000/3 00000/1 0000000/1 0000000/1 0000000/1 LW 00001/4 0000/3 python code/9 Code for
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11
     Waiting 5s.....
    Optimize the ./R 18 4.xlsx instance by BDC
13
14
15
            Master protblem status = 2, is Optimal
16
            sol MP obj = 1012.0
    The initial lb = -inf
                                      ub = inf
17
18
19
     The current iteration cnt = 0
20
            Dual problem status = 2, is Optimal
21
            Add optimal cut
22
            Master protblem status = 2, is Optimal
            Deterministic Sub problem Status= 2, is Optimal
            lb = 1053.9957907730552
                                                                     ub = 1053.9957907730552
24
            MPObj = 1053.9957907730552
                                                                                                                 DualSPObj = 9.995790773055177
2.5
                                                              MPObj_Remove_Hua = 1044.0
                                                                                                                                                                      Hua = 9.995790773055175
     Deterministic\_SP\_SPObj = 874.0
26
     ub - 1b = 0.0
27
28
29
     Iteration cycle stopped by termination criterion 1: Because ub - lb \le eps, the iteration stop, and cnt = 0
30
         i: 0.0 1 i: 6.0 p i: 0.0 aI i: 59.0 sol a i: 59.0 sol g i: 0.0 d i: 74.0 sol taoi: 59.0 sol deltai - sol taoi: 19.0 sol taoP:
     59.0
                sol_deltaP: 69.0 sol_deltaP - sol_taoP: 10.0 cl_i: 4923592.0 sol_c_i: 4923592.0 sol_gp_i: 0.0 total work: 5009236.0 wasted work: 0.
     32484714235863515
31
         i: 1.0 1 i: 5.0 p i: 12.0 aI i: 57.0
                                                                     sol a i: 57.0 sol g i: 0.0 d i: 69.0 sol taoi: 57.0 sol deltai: 72.0 sol deltai - sol taoi: 15.0 sol taoP
        57.0 sol_deltaP: 60.0 sol_deltaP - sol_taoP: 3.0 cl_i: 3860630.0 sol_c_i: 3860630.0 sol_gp_i: 0.0 total work: 3954660.0 wasted work: 0.
      35665518653942435
         i: 2.0 1_i: 6.0 p_i: 5.0 aI_i: 48.0
                                                                  sol_a_i: 48.0 sol_g_i: 0.0 d_i: 55.0 sol_taoi: 48.0 sol_deltai: 57.0 sol_deltai - sol_taoi: 9.0 sol_taoP:
               sol deltaP: 53.0 sol deltaP - sol taoP: 5.0 cI i: 2369296.0
                                                                                                           sol_c_i: 2369296.0 sol_gp_i: 0.0 total work: 2372796.0 wasted work: 0.
     48.0
     013275477537892006
33
         i: 3.0 1_i: 4.0 p_i: 0.0 aI_i: 10.0
                                                                   sol a i: 10.0 sol g i: 0.0 d i: 16.0 sol taoi: 10.0 sol deltai: 18.0 sol deltai - sol taoi: 8.0 sol taoP:
      10.0 sol_deltaP: 14.0 sol_deltaP - sol_taoP: 4.0 cI_i: 1989904.0
                                                                                                           sol_c_i: 1989904.0 sol_gp_i: 0.0 total work: 2109152.0 wasted work: 0.
     4523068986967274
34
         i: 4.0 l_i: 4.0 p_i: 4.0 al_i: 15.0
                                                               sol_a_i: 15.0 sol_g_i: 0.0 d_i: 26.0 sol_taoi: 15.0 sol_deltai: 29.0 sol_deltai - sol_taoi: 14.0 sol_taoP:
               sol_deltaP: 22.0 sol_deltaP - sol_taoP: 7.0 cI_i: 3456313.0
                                                                                                           sol_c_i: 3456313.0 sol_gp_i: 0.0 total work: 3691016.0 wasted work: 0.
     8902269727359622
                                                                     sol_a_i: 38.0 sol_g_i: 0.0 d_i: 51.0 sol_taoi: 38.0 sol_deltai: 55.0 sol_deltai - sol taoi: 17.0 sol taoP
         i: 5.0 1_i: 5.0 p_i: 11.0 aI_i: 38.0
35
        38.0 sol deltaP: 41.0 sol deltaP - sol taoP: 3.0 cI i: 4255636.0 sol c i: 4255636.0 sol gp i: 0.0 total work: 4481948.0 wasted work: 0.
        i: 6.0\ l\_i: 4.0\ p\_i: 26.0\ al\_i: 55.0\ sol\_a\_i: 55.0\ sol\_a\_i: 55.0\ sol\_a\_i: 66.0\ sol\_tao: 55.0\ sol\_deltai: 69.0\ sol\_delta
36
      1181820940358969
         i: 7.0 1 i: 6.0 p i: 8.0 aI i: 3.0
                                                                  sol_a_i: 3.0 sol_g_i: 0.0 d_i: 13.0 sol_taoi: 3.0 sol_deltai: 16.0 sol_deltai - sol_taoi: 13.0 sol_taoP: 3.0
         sol deltaP: 6.0 sol deltaP - sol taoP: 3.0 cl i: 3380801.0
                                                                                               sol c i: 3380801.0 sol gp i: 0.0 total work: 4745592.0 wasted work: 5.
      176643504119191
38
         i: 8.0 l_i: 4.0 p_i: 17.0 al_i: 63.0
                                                                     sol_a_i: 63.0 sol_g_i: 0.0 d_i: 76.0 sol_taoi: 63.0 sol_deltai: 80.0 sol_deltai - sol_taoi: 17.0 sol_taoP
        63.0 sol_deltaP: 67.0 sol_deltaP - sol_taoP: 4.0 cl_i: 4344824.0 sol_c_i: 4344824.0 sol_gp_i: 0.0 total work: 4481948.0 wasted work: 0.
      5201104519731152
39
         i: 9.0 1 i: 6.0 p i: 6.0 aI i: 64.0
                                                               sol a i: 64.0 sol g i: 0.0 d i: 76.0 sol taoi: 64.0 sol deltai: 80.0 sol deltai - sol taoi: 16.0 sol taoP:
               sol deltaP: 69.0 sol deltaP - sol taoP: 5.0 cl i: 4152019.0 sol c i: 4152019.0 sol gp i: 0.0 total work: 4218304.0 wasted work: 0.
     2514185795997633
                                                                   sol_a i: 39.0 sol_g i: 0.0 d_i: 52.0 sol_taoi: 39.0 sol_deltai: 56.0 sol_deltai - sol_taoi: 17.0 sol_taoP
         : 39.0 sol_deltaP: 44.0 sol_deltaP - sol_taoP: 5.0 cl_i: 4295445.0 sol_c_i: 4295445.0 sol_gp_i: 0.0 total work: 4481948.0 wasted work: 0.
      7074046820712779
         i: 11.0 l_i: 5.0 p_i: 12.0 al_i: 70.0
                                                                         sol_a_i: 74.0 sol_g_i: 0.8 d_i: 83.0 sol_taoi: 74.0 sol_deltai: 91.0 sol_deltai - sol_taoi: 17.0
      sol_taoP: 74.0 sol_deltaP: 81.0 sol_deltaP - sol_taoP: 7.0 cl_i: 4396569.0 sol_c_i: 4396569.0 sol_gp_i: 0.0 total work: 4481948.0 wasted work
      : 0.3238419990593376
                                                                         sol a i: 6.0 sol g i: 0.0 d i: 26.0 sol taoi: 6.0 sol deltai: 22.0 sol deltai - sol taoi: 16.0 sol taoP
         : 6.0 sol_deltaP: 10.0 sol_deltaP - sol_taoP: 4.0 cl_i: 4086488.0 sol_e_i: 5931996.0 sol_gp_i: 1.0 total work: 6063812.0 wasted work: 0.
      49997724203850646
        i: 13.0 1 i: 6.0 p i: 21.0 aI i: 65.0
                                                                         sol_a_i: 75.0 sol_g_i: 1.0 d_i: 80.0 sol_taoi: 75.0 sol_deltai: 88.0 sol_deltai - sol_taoi: 13.0
     sol_taoP: 75.0 sol_deltaP: 79.0 sol_deltaP - sol_taoP: 4.0 cl_i: 3334757.0 sol_c_i: 3334757.0 sol_gp_i: 0.0 total work: 3427372.0 wasted work
      : 0.3512881006205337
         sol_a_i: 47.2 sol_g_i: 0.6 d_i: 54.0 sol_taoi: 48.0 sol_deltai: 62.0 sol_deltai - sol_taoi: 14.0
     sol taoP: 48.0 sol_deltaP: 52.0 sol_deltaP - sol_taoP: 4.0 cl_i: 3540267.0 sol_c_i: 4858487.0 sol_gp_i: 1.0 total work: 6063812.0 wasted work
      : 4.571789989531338
45
         sol_a_i: 74.0 sol_g_i: 0.0 d_i: 83.0 sol_taoi: 74.0 sol_deltai: 82.0 sol_deltai - sol_taoi: 8.0
     sol taoP: 74.0
                            sol deltaP: 78.0 sol deltaP - sol taoP: 4.0 cI i: 2103670.0 sol c i: 4212822.0 sol gp i: 1.0 total work: 4481948.0 wasted work
      : 1.020793190817921
         i: 16.0 l_i: 6.0 p_i: 16.0 al_i: 27.0
                                                                         sol_a_i: 30.6 sol_g_i: 0.6 d_i: 43.0 sol_taoi: 31.0 sol_deltai: 48.0 sol_deltai - sol_taoi: 17.0
                             sol_deltaP: 37.0 sol_deltaP - sol_taoP: 6.0 cl_i: 4339302.0
                                                                                                                       sol_c_i: 4339302.0 sol_gp_i: 0.0 total work: 4613770.0 wasted work
      sol_taoP: 31.0
```

```
46 : 1.0410553625343266
     i: 17.0 l_i: 5.0 p_i: 22.0 al_i: 19.0 sol_a_i: 28.0 sol_g_i: 1.0 d_i: 38.0 sol_taoi: 28.0 sol_deltai: 41.0 sol_deltai - sol_taoi: 13.0 sol_taoP: 28.0 sol_deltaP: 34.0 sol_deltaP - sol_taoP: 6.0 cl_i: 3307644.0 sol_c_i: 5416796.0 sol_gp_i: 1.0 total work: 5536524.0 wasted work: 0.4541275356162097
49 Optimal objective = 1918.0
50
51 Time: 491.000000
52
53
54
55
```