```
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=31451
  2
  3
       import sys; print('Python %s on %s' % (sys.version, sys.platform))
       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
       python code/9 Code for this paper')
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11
        Waiting 5s.....
13 Optimize the ./R 16 4.xlsx instance by ECCG
14
15
                  Master protblem status = 2, is Optimal and MP obj = 791.0
16
       The initial lb = -inf
                                                      ub = inf
17
18
       The current iteration cnt = 0
19
                  The SP model was solved Optimal 2 and SPObj = 784.0
20
                  Deterministic Sub problem Status= 2, is Optimal
                  Master protblem status = 2, is Optimal
21
22
                 1b = 1470.0
                                                                      ub = 1470.0
                   MPObj = 1470.0
23
                                                           MP delete Hua Obj = 819.0
                                                                                                                                 Hua = 651.0
                                                                                                                                                                   SPObj = 784.0
                                                                                                                                                                                                         Deter SP Obj = 651.0
24
25
       ub - 1b = 0.0
26
27 Iteration cycle stopped by termination criterion 1: Because ub - lb \leq eps, the iteration stop, and cnt = 0
             i: 0.0 1_i: 4.0 p_i: 14.0 aI_i: 25.0 sol_a_i: 25.0 sol_g_i: 0.0 d_i: 38.0 sol_taoi: 25.0 sol_deltai: 38.0 sol_deltai: 38.0 sol_deltai - sol_taoi: 13.0 sol_taoP
28
        : 26.0 sol_deltaP: 29.0 sol_deltaP - sol_taoP: 3.0 cI_i: 3171685.0
                                                                                                                                                        sol_c_i: 3171685.0 sol_gp_i: 0.0 total work: 3559194.0 wasted work: 1.
        469819150065998
29
            i: 1.0 1 i: 4.0 p i: 4.0 aI i: 46.0
                                                                                               sol a i: 46.0 sol g i: 0.0 d i: 63.0 sol taoi: 46.0 sol deltai: 63.0 sol deltai - sol taoi: 17.0 sol taoP:
                      sol_deltaP: 55.0 sol_deltaP - sol_taoP: 9.0 cI_i: 4356745.0
                                                                                                                                                         sol_c_i: 4356745.0 sol_gp_i: 0.0 total work: 4481948.0 wasted work: 0.
       46.0
        4748941754790551
             i: 2.0 1 i: 5.0 p i: 7.0 aI i: 18.0
                                                                                               sol a i: 18.0 sol g i: 0.0 d i: 27.0 sol taoi: 18.0 sol deltai: 27.0 sol deltai - sol taoi: 9.0 sol taoP:
                      sol_deltaP: 22.0 sol_deltaP - sol_taoP: 4.0 cI_i: 2167120.0
                                                                                                                                                         sol_c_i: 2167120.0 sol_gp_i: 0.0 total work: 2240974.0 wasted work: 0.
        2801277480238503
             i: 3.0 1_i: 6.0 p_i: 8.0 aI_i: 28.0
                                                                                               sol_a_i: 28.0 sol_g_i: 0.0 d_i: 37.0 sol_taoi: 28.0 sol_deltai: 37.0 sol_deltai - sol_taoi: 9.0 sol_taoP:
31
                      sol deltaP: 30.0 sol deltaP - sol taoP: 2.0 cI i: 2226140.0
                                                                                                                                                        sol_c_i: 2226140.0 sol_gp_i: 0.0 total work: 2372796.0 wasted work: 0.
        5562652667991685
              i: 4.0 1_i: 7.0 p_i: -0.0 aI_i: 19.0
                                                                                                     sol_a_i: 19.0 sol_g_i: 0.0 d_i: 43.0 sol_taoi: 19.0 sol_deltai: 43.0 sol_deltai - sol_taoi: 24.0 sol_taoP
           19.0 sol_deltaP: 31.0 sol_deltaP - sol_taoP: 12.0 cl_i: 6133379.0 sol_c_i: 6133379.0 sol_g_i: 0.0 total work: 6327456.0 wasted work: 0.
        7361328154632762
                                                                                           sol_a_i: 54.0 sol_g_i: 0.0 d_i: 67.0 sol_taoi: 54.0 sol_deltai: 67.0 sol_deltai - sol_taoi: 13.0 sol_taoP:
33
             i: 5.0 1_i: 5.0 p_i: 8.0 aI_i: 54.0
                      sol_deltaP: 59.0 sol_deltaP - sol_taoP: 5.0 cI_i: 3260541.0 sol_c_i: 3260541.0 sol_gp_i: 0.0 total work: 3427372.0 wasted work: 0.
        6327889123211603
           i: 6.0 l_i: 4.0 p_i: 13.0 al_i: 65.0 sol_a_i: 65.0 sol_g_i: 0.0 d_i: 83.0 sol_taoi: 65.0 sol_deltai: 85.0 so
                                                                                                   sol_a_i: 65.0 sol_g_i: 0.0 d_i: 83.0 sol_taoi: 65.0 sol_deltai: 85.0 sol_deltai - sol_taoi: 20.0 sol_taoP
34
        3294101136380877
           i: 7.0\ 1_i: 5.0\ p_i: 25.0\ a_i: 12.0\ sol\_a_i: 12.0\ sol\_a_i: 12.0\ sol\_a_i: 21.0\ sol\_a_i: 21.0\ sol\_a_ii: 21.0\ sol\_
35
        4076785362079167
                                                                                           sol a i: 38.0 sol g i: 0.0 d i: 49.0 sol taoi: 38.0 sol deltai: 49.0 sol deltai - sol taoi: 11.0 sol taoP:
             i: 8.0 1 i: 5.0 p i: 9.0 aI i: 38.0
        38.0 sol deltaP: 40.0 sol deltaP - sol taoP: 2.0 cl i: 2738944.0 sol c i: 2738944.0 sol gp i: 0.0 total work: 3691016.0 wasted work: 3.
        611202985844548
           i: 9.0\ l_{\_i}: 4.0\ p_{\_i}: 25.0\ al_{\_i}: 18.0\ sol_{\_a}:: 22.0\ sol_{\_g}:: 0.8\ d_{\_i}: 40.0\ sol_{\_a}: 22.0\ sol_{\_d}: 22.0\ sol_{\_d}
                                                                                                   sol_a_i: 22.0 sol_g_i: 0.8 d_i: 40.0 sol_taoi: 22.0 sol_deltai: 43.0 sol_deltai - sol_taoi: 21.0 sol_taoP
        3980026095795846
38
             i: 10.0 1 i: 6.0 p i: 19.0 aI i: 17.0
                                                                                                         sol_a_i: 19.0 sol_g_i: 0.25 d_i: 43.0 sol_taoi: 19.0 sol_deltai: 40.0 sol_deltai - sol_taoi: 21.0
        sol taoP: 19.0 sol deltaP: 24.0 sol deltaP - sol taoP: 5.0 cl i: 5337655.0 sol c i: 5337655.0 sol gp i: 0.0 total work: 5404702.0 wasted work
        : 0.25430884070944154
              sol_a_i: 53.0 sol_g_i: 0.3 d_i: 75.0 sol_taoi: 53.0 sol_deltai: 69.0 sol_deltai - sol_taoi: 16.0
39
        sol_taoP: 53.0 sol_deltaP: 56.0 sol_deltaP - sol_taoP: 3.0 cl_i: 4079978.0 sol_c_i: 5134554.0 sol_gp_i: 1.0 total work: 5272880.0 wasted work
         : 0.5246696302589856
                                                                                                         sol\_a\_i: \ 15.0 \ sol\_g\_i: \ 0.14285714285714285 \quad d\_i: \ 28.0 \quad sol\_taoi: \ 15.0 \quad sol\_deltai: \ 27.0 \quad sol\_del
            sol_taoi: 12.0 sol_taoP: 15.0 sol_deltaP: 19.0
                                                                                                             sol_deltaP - sol_taoP: 4.0 cI_i: 3077210.0 sol_c_i: 4462524.0 sol_gp_i: 0.7506410159154011
        total work: 4481948.0 wasted work: 0.07367510734171838
             sol_a_i: 71.6611111111111 sol_g_i: 0.9515873015873015 d_i: 83.0 sol_taoi: 72.0 sol_deltai: 96.0
              sol_deltai - sol_taoi: 24.0 sol_taoP: 72.0 sol_deltaP: 81.0 sol_deltaP - sol_taoP: 9.0 cl_i: 6195972.0 sol_c_i: 6327456.0 sol_gp_i: 0.
        24935898408459956 total work: 6327456.0 wasted work: 0.0
            i: 14.0 1 i: 6.0 p i: 24.0 aI i: 61.0
                                                                                                      sol a i: 67.0 sol g i: 1.0 d i: 83.0 sol taoi: 67.0 sol deltai: 91.0 sol deltai - sol taoi: 24.0
        sol_taoP: 67.0 sol_deltaP: 72.0 sol_deltaP - sol_taoP: 5.0 cl_i: 6094147.0 sol_c_i: 7412367.0 sol_gp_i: 1.0 total work: 8436608.0 wasted work
        : 3.884939539682299
              sol_a_i: 11.0 sol_g_i: 0.55555555555555556 d_i: 26.0 sol_taoi: 11.0 sol_deltai: 23.0 sol_deltai -
        sol_taoi: 12.0 sol_taoP: 11.0 sol_deltaP: 18.0 sol_deltaP - sol_taoP: 7.0 cl_i: 3009208.0 sol_c_i: 5118360.0 sol_gp_i: 1.0 total work: 5272880.0
              wasted work: 0.5860933683300208
44
       Time: 191.000000
45
46
```

47 48