```
 1  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=55389
 2
 3  import sys; print('Python %s on %s' % (sys.version, sys.platform))
 4  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'])
 5
 6  PyDev console: starting.
 7
 8  Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC v.1929 64 bit (AMD64)] on win32
 9  >>> runfile('E:/1 □□□□/3 □□□□□/1 □□□□□□□/1 □□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□1/4 □□□□□/3 python_code/9 Code for this paper/
    main_DM.py', wdir='E:/1 □□□□/3 □□□□□/1 □□□□□□□/1 □□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□1/4 □□□□□/3 python_code/9 Code for this
    paper')
10  Backend TkAgg is interactive backend. Turning interactive mode on.
11  Waiting 5s......
12
13  Optimize the ./R_5_8.xlsx instance
14
15  Set parameter TimeLimit to value 1200
16
17  Set parameter PoolSolutions to value 3
18  Set parameter PoolGap to value 0.05
19  Set parameter PoolSearchMode to value 2
20  Gurobi Optimizer version 11.0.0 build v11.0.0rc2 (win64 - Windows 10.0 (19045.2))
21
22  CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
23  Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
24
25  Optimize a model with 71827 rows, 39860 columns and 208375 nonzeros
26  Model fingerprint: 0x3bc3622e
27  Variable types: 0 continuous, 39860 integer (33525 binary)
28  Coefficient statistics:
29    Matrix range     [1e+00, 5e+05]
30    Objective range  [1e+00, 1e+00]
31    Bounds range     [1e+00, 1e+00]
32    RHS range        [1e+00, 6e+06]
33  Presolve removed 61397 rows and 1691 columns
34  Presolve time: 0.13s
35  Presolved: 10430 rows, 38169 columns, 29186 nonzeros
36  Variable types: 0 continuous, 38169 integer (31839 binary)
37
38  Root relaxation: objective 2.587606e+02, 1562 iterations, 0.07 seconds (0.12 work units)
39
40      Nodes    |    Current Node    |     Objective Bounds      |     Work
41   Expl Unexpl |  Obj  Depth IntInf | Incumbent    BestBd   Gap | It/Node Time
42
43      0    0  258.76064    0 1284        -  258.76064      -     -    0s
44  H   0    0                    413.0000000  258.76064  37.3%     -    1s
45      0    0  275.47662    0 1243  413.00000  275.47662  33.3%     -    1s
46      0    0  304.28280    0 1069  413.00000  304.28280  26.3%     -    5s
47      0    0  304.30256    0 1285  413.00000  304.30256  26.3%     -    5s
48      0    0  304.57416    0 1126  413.00000  304.57416  26.3%     -    5s
49      0    0  304.59411    0 1122  413.00000  304.59411  26.2%     -    5s
50      0    2  304.59411    0 1122  413.00000  304.59411  26.2%     -    7s
51   2258 1862  351.15403  124 1122  413.00000  304.59411  26.2%   9.5   11s
52   2277 1875  407.09001  198  107  413.00000  407.09001  1.43%   9.4   15s
53
54  Cutting planes:
55    Learned: 166
56    Gomory: 76
57    Implied bound: 5
58    Projected implied bound: 19
59    MIR: 208
60    StrongCG: 170
61    Flow cover: 74
62    Zero half: 5
63    RLT: 11
64    Relax-and-lift: 222
65    BQP: 7
66
67  Explored 2281 nodes (41416 simplex iterations) in 15.46 seconds (18.99 work units)
68  Thread count was 8 (of 8 available processors)
69
70  Solution count 3: 413 413 413
71  No other solutions better than 413
72
73  Optimal solution found (tolerance 1.00e-04)
74  Best objective 4.130000000000e+02, best bound 4.130000000000e+02, gap 0.0000%
75
76  Output optimal solution and the Optimal Obj: 413.0
77
78
79  Obj = 413.0
80
```

```
81  Solutions:
82      The total pi =  60.0
83      The total duration time in berth stage =  100.0
84      The total duration time in quay crane scheduling stage =  25.0
85      The total departure time in berth stage=  244.0
86      The total departure time in quay crane scheduling stage =  169.0
87      The total wasted crane work hour according QC0=  2.6195892946549133
88      The last depature time in quay crane scheduling stage =  62.0
89
90  The specific solution are as follows:
91      Vessel i: 0:     li: 6,         pi: 8-14,          ai-di: 15-42,          taoi-deltai: 15-40,          periodi: 25,              taoPi_SP-deltaPi_SP
         : 15-20,          periodPi: 5,                    c_i: 6352058,              dowork: 6591100,                fa_i: 3
92      Vessel i: 1:     li: 4,         pi: 14-18,         ai-di: 3-17,           taoi-deltai: 3-15,           periodi: 12,             taoPi_SP-deltaPi_SP
         : 3-5,           periodPi: 2,                    c_i: 2945501,              dowork: 3163728,                fa_i: 4
93      Vessel i: 2:     li: 5,         pi: 14-19,         ai-di: 26-45,          taoi-deltai: 26-43,          periodi: 17,             taoPi_SP-
         deltaPi_SP: 26-30,              periodPi: 4,                    c_i: 4411870,              dowork: 4481948,                fa_i: 3
94      Vessel i: 3:     li: 4,         pi: 10-14,         ai-di: 45-73,          taoi-deltai: 45-68,          periodi: 23,             taoPi_SP-
         deltaPi_SP: 45-52,              periodPi: 7,                    c_i: 5858947,              dowork: 5931990,                fa_i: 2
95      Vessel i: 4:     li: 5,         pi: 14-19,         ai-di: 55-81,          taoi-deltai: 55-78,          periodi: 23,             taoPi_SP-
         deltaPi_SP: 55-62,              periodPi: 7,                    c_i: 5973563,              dowork: 6063812,                fa_i: 2
96  TimeSolveModel: 22.000000
97
98  TimeAll: 25.000000
99
100
```