```
 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=3078
 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_6_7.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 100206 rows, 47910 columns and 292506 nonzeros
26  Model fingerprint: 0xc8bbc8cb
27  Variable types: 0 continuous, 47910 integer (40308 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, 7e+06]
33  Presolve removed 87329 rows and 2251 columns
34  Presolve time: 0.13s
35  Presolved: 12877 rows, 45659 columns, 36740 nonzeros
36  Variable types: 0 continuous, 45659 integer (38063 binary)
37
38  Root relaxation: objective 2.887157e+02, 1661 iterations, 0.06 seconds (0.14 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  288.71567    0 1321       -  288.71567    -     -   0s
44  H   0    0                478.0000000 288.71567 39.6%     -   1s
45  H   0    0                477.0000000 288.71567 39.5%     -   1s
46      0    0  303.76697    0 1325  477.00000 303.76697 36.3%     -   1s
47      0    0  336.00000    0 1323  477.00000 336.00000 29.6%     -   5s
48      0    0  336.00000    0 1202  477.00000 336.00000 29.6%     -   5s
49      0    0  338.00000    0 1291  477.00000 338.00000 29.1%     -   8s
50      0    0  338.00000    0 1291  477.00000 338.00000 29.1%     -   8s
51      0    0  338.00000    0 1177  477.00000 338.00000 29.1%     -   8s
52      0    0  338.56807    0 1024  477.00000 338.56807 29.0%     -  11s
53      0    0  338.56807    0 1221  477.00000 338.56807 29.0%     -  11s
54      0    0  338.56807    0 1222  477.00000 338.56807 29.0%     -  11s
55      0    0  338.56807    0  956  477.00000 338.56807 29.0%     -  11s
56      0    0  339.00000    0 1138  477.00000 339.00000 28.9%     -  14s
57      0    0  339.00000    0 1085  477.00000 339.00000 28.9%     -  14s
58      0    0  339.00000    0 1107  477.00000 339.00000 28.9%     -  14s
59      0    0  339.00000    0 1102  477.00000 339.00000 28.9%     -  14s
60      0    2  339.00000    0 1102  477.00000 339.00000 28.9%     -  16s
61   1469 1478  372.45010  363  607  477.00000 339.00000 28.9%  30.2  20s
62   1950 1871  345.87088  117 1102  477.00000 339.00000 28.9%  35.0  27s
63   1955 1874  465.56614   35   63  477.00000 465.56614 2.40%  35.0  30s
64  H 1960 1783                476.0000000 474.00000 0.42%  34.9  30s
65
66  Optimal solution found at node 1963 - now completing solution pool...
67   1964 1785  476.00000  364   25  477.00000 476.00000 0.21%  34.8   31s
68
69  Explored 1970 nodes (86450 simplex iterations) in 31.37 seconds (43.04 work units)
70  Thread count was 8 (of 8 available processors)
71
72  Solution count 3: 476 476 476
73  No other solutions better than 476
74
75  Optimal solution found (tolerance 1.00e-04)
76  Best objective 4.760000000000e+02, best bound 4.760000000000e+02, gap 0.0000%
77
78  Output optimal solution and the Optimal Obj: 476.0
79
80
```

```
81  Obj = 476.0
82
83  Solutions:
84      The total pi =  107.0
85      The total duration time in berth stage =  93.0
86      The total duration time in quay crane scheduling stage =  21.0
87      The total departure time in berth stage= 274.0
88      The total departure time in quay crane scheduling stage =  202.0
89      The total wasted crane work hour according QC0=  1.9961918344434162
90      The last depature time in quay crane scheduling stage =  57.0
91
92  The specific solution are as follows:
93      Vessel i: 0:    li: 5,      pi: 19-24,         ai-di: 49-77,         taoi-deltai: 49-75,       periodi: 26,              taoPi_SP-
        deltaPi_SP: 49-57,         periodPi: 8,                c_i: 6837804,         dowork: 6986566,                    fa_i: 2
94      Vessel i: 1:    li: 5,      pi: 23-28,         ai-di: 12-31,         taoi-deltai: 12-29,       periodi: 17,             taoPi_SP-
        deltaPi_SP: 12-15,         periodPi: 3,                c_i: 4225339,         dowork: 4350126,                    fa_i: 5
95      Vessel i: 2:    li: 7,      pi: 16-23,         ai-di: 13-23,         taoi-deltai: 13-21,       periodi: 8,         taoPi_SP-deltaPi_SP
        : 13-15,         periodPi: 2,                c_i: 1954966,         dowork: 1977330,            fa_i: 4
96      Vessel i: 3:    li: 6,      pi: 24-30,         ai-di: 40-54,         taoi-deltai: 40-52,       periodi: 12,             taoPi_SP-
        deltaPi_SP: 40-42,         periodPi: 2,                c_i: 3018028,         dowork: 3163728,                    fa_i: 5
97      Vessel i: 4:    li: 4,      pi: 10-14,         ai-di: 26-49,         taoi-deltai: 26-46,       periodi: 20,             taoPi_SP-
        deltaPi_SP: 26-30,         periodPi: 4,                c_i: 5255330,         dowork: 5272880,                    fa_i: 3
98      Vessel i: 5:    li: 4,      pi: 15-19,         ai-di: 41-60,         taoi-deltai: 41-51,       periodi: 10,             taoPi_SP-
        deltaPi_SP: 41-43,         periodPi: 2,                c_i: 2569319,         dowork: 2636440,                    fa_i: 4
99  TimeSolveModel: 38.000000
100
101 TimeAll: 41.000000
102
103
```