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=38245

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_10.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: 0x49765048
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, 5e+06]
33. Presolve removed 87021 rows and 2216 columns
34. Presolve time: 0.13s
35. Presolved: 13185 rows, 45694 columns, 37579 nonzeros
36. Variable types: 0 continuous, 45694 integer (38098 binary)
37. Found heuristic solution: objective 592.0000000
38.
39. Root relaxation: objective 2.503471e+02, 1636 iterations, 0.06 seconds (0.14 work units)
40.

```
41.     Nodes    |    Current Node    |     Objective Bounds      |     Work
42.  Expl Unexpl |  Obj  Depth IntInf | Incumbent    BestBd   Gap | It/Node Time
43.
44.     0    0 250.34707    0 1356  592.00000  250.34707 57.7%     -    0s
45. H   0    0                 407.0000000  250.34707 38.5%     -    0s
46.     0    0 260.73894    0 1355  407.00000  260.73894 35.9%     -    1s
47.     0    0 265.09903    0 1265  407.00000  265.09903 34.9%     -    4s
48.     0    0 265.10701    0 1356  407.00000  265.10701 34.9%     -    4s
49.     0    0 267.35478    0  981  407.00000  267.35478 34.3%     -    5s
50.     0    0 267.75242    0 1309  407.00000  267.75242 34.2%     -    6s
51.     0    0 267.77634    0 1309  407.00000  267.77634 34.2%     -    6s
52.     0    0 269.42191    0  927  407.00000  269.42191 33.8%     -    7s
53.     0    0 270.64127    0 1079  407.00000  270.64127 33.5%     -    8s
54.     0    0 270.83226    0 1069  407.00000  270.83226 33.5%     -    8s
55.     0    0 270.83980    0 1075  407.00000  270.83980 33.5%     -    8s
56.     0    0 272.03836    0 1157  407.00000  272.03836 33.2%     -    8s
57.     0    0 272.12193    0 1034  407.00000  272.12193 33.1%     -   12s
58.     0    0 272.13438    0 1031  407.00000  272.13438 33.1%     -   12s
59.     0    0 272.20868    0 1024  407.00000  272.20868 33.1%     -   12s
60.     0    0 272.22411    0 1028  407.00000  272.22411 33.1%     -   15s
61.     0    0 272.33696    0 1002  407.00000  272.33696 33.1%     -   15s
62.     0    0 272.34653    0  970  407.00000  272.34653 33.1%     -   15s
63.     0    2 283.00000    0  964  407.00000  283.00000 30.5%     -   17s
64.   863  903 285.26965  213  996  407.00000  283.00000 30.5%  7.3   20s
65.  2040 1925 396.00000   69  852  407.00000  396.00000 2.70%  9.2   25s
66.
```

67. Cutting planes:
68.   Learned: 313
69.   Gomory: 6
70.   Implied bound: 2
71.   Projected implied bound: 20
72.   MIR: 43
73.   StrongCG: 25
74.   Flow cover: 84
75.   Zero half: 8
76.   RLT: 65
77.   Relax-and-lift: 321
78.   BQP: 20
79.
80. Explored 2048 nodes (37269 simplex iterations) in 27.34 seconds (34.13 work units)

```
 81  Thread count was 8 (of 8 available processors)
 82
 83  Solution count 3: 407 407 407
 84  No other solutions better than 407
 85
 86  Optimal solution found (tolerance 1.00e-04)
 87  Best objective 4.070000000000e+02, best bound 4.070000000000e+02, gap 0.0000%
 88
 89  Output optimal solution and the Optimal Obj: 407.0
 90
 91
 92  Obj = 407.0
 93
 94  Solutions:
 95      The total pi = 73.0
 96      The total duration time in berth stage = 87.0
 97      The total duration time in quay crane scheduling stage = 16.0
 98      The total departure time in berth stage= 239.0
 99      The total departure time in quay crane scheduling stage = 168.0
100      The total wasted crane work hour according QC0= 5.4080312846110665
101      The last depature time in quay crane scheduling stage = 45.0
102
103  The specific solution are as follows:
104      Vessel i: 0:    li: 6,        pi: 14-20,        ai-di: 34-49,       taoi-deltai: 34-47,       periodi: 13,        taoPi_SP-
         deltaPi_SP: 34-36,            periodPi: 2,           c_i: 3303083,           dowork: 4218304,           fa_i: 6
105      Vessel i: 1:    li: 7,        pi: 7-14,        ai-di: 42-60,       taoi-deltai: 42-58,       periodi: 16,       taoPi_SP-deltaPi_SP
         : 42-45,        periodPi: 3,            c_i: 4011907,           dowork: 4218304,           fa_i: 5
106      Vessel i: 2:    li: 5,        pi: 9-14,        ai-di: 26-40,       taoi-deltai: 26-38,       periodi: 12,       taoPi_SP-deltaPi_SP
         : 26-28,        periodPi: 2,            c_i: 3110426,           dowork: 3163728,           fa_i: 4
107      Vessel i: 3:    li: 5,        pi: 9-14,        ai-di: 7-24,       taoi-deltai: 7-22,       periodi: 15,      taoPi_SP-deltaPi_SP: 7
         -10,        periodPi: 3,            c_i: 3807596,           dowork: 3822838,           fa_i: 3
108      Vessel i: 4:    li: 5,        pi: 20-25,        ai-di: 41-57,       taoi-deltai: 41-52,       periodi: 11,        taoPi_SP-
         deltaPi_SP: 41-44,            periodPi: 3,           c_i: 2751222,           dowork: 2768262,           fa_i: 3
109      Vessel i: 5:    li: 6,        pi: 14-20,        ai-di: 2-27,       taoi-deltai: 2-22,       periodi: 20,       taoPi_SP-deltaPi_SP
         : 2-5,        periodPi: 3,            c_i: 5054287,           dowork: 5272880,           fa_i: 6
110  TimeSolveModel: 34.000000
111
112  TimeAll: 37.000000
113
114
```