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=39109
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_7_3.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 133301 rows, 56000 columns and 390789 nonzeros
26. Model fingerprint: 0x681d6c67
27. Variable types: 0 continuous, 56000 integer (47131 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 110762 rows and 2288 columns
34. Presolve time: 0.25s
35. Presolved: 22539 rows, 53712 columns, 69428 nonzeros
36. Variable types: 0 continuous, 53712 integer (44850 binary)
37.
38. Root relaxation: objective 3.344252e+02, 1968 iterations, 0.07 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   0 334.42519   0 1427   - 334.42519   -   -   0s
44. H   0   0   520.0000000 334.42519 35.7%   -   1s
45. H   0   0   518.0000000 334.42519 35.4%   -   1s
46.   0   0 361.13461   0 1493 518.00000 361.13461 30.3%   -   2s
47. H   0   0   516.0000000 361.22173 30.0%   -   7s
48.   0   0 362.74080   0 1493 516.00000 362.74080 29.7%   -   7s
49.   0   0 372.62492   0 1196 516.00000 372.62492 27.8%   -   8s
50.   0   0 379.45076   0 1103 516.00000 379.45076 26.5%   - 10s
51.   0   0 379.45076   0 1077 516.00000 379.45076 26.5%   - 10s
52.   0   0 386.48877   0 723 516.00000 386.48877 25.1%   - 10s
53.   0   0 386.63363   0 819 516.00000 386.63363 25.1%   - 10s
54.   0   0 386.64272   0 760 516.00000 386.64272 25.1%   - 10s
55.   0   0 388.01558   0 736 516.00000 388.01558 24.8%   - 11s
56.   0   0 388.63978   0 844 516.00000 388.63978 24.7%   - 11s
57.   0   0 389.07130   0 811 516.00000 389.07130 24.6%   - 11s
58.   0   0 389.10849   0 788 516.00000 389.10849 24.6%   - 11s
59.   0   0 389.11652   0 774 516.00000 389.11652 24.6%   - 11s
60.   0   0 389.50218   0 971 516.00000 389.50218 24.5%   - 11s
61.   0   0 390.02113   0 965 516.00000 390.02113 24.4%   - 12s
62.   0   0 390.02113   0 966 516.00000 390.02113 24.4%   - 12s
63.   0   0 390.33462   0 855 516.00000 390.33462 24.4%   - 12s
64.   0   0 390.42797   0 988 516.00000 390.42797 24.3%   - 12s
65.   0   0 390.43378   0 948 516.00000 390.43378 24.3%   - 12s
66.   0   0 390.81791   0 890 516.00000 390.81791 24.3%   - 12s
67.   0   0 391.33606   0 868 516.00000 391.33606 24.2%   - 12s
68.   0   0 391.41970   0 959 516.00000 391.41970 24.1%   - 12s
69.   0   0 391.43300   0 964 516.00000 391.43300 24.1%   - 13s
70.   0   0 393.08062   0 945 516.00000 393.08062 23.8%   - 13s
71.   0   0 395.59511   0 985 516.00000 395.59511 23.3%   - 13s
72.   0   0 395.67307   0 942 516.00000 395.67307 23.3%   - 13s
73.   0   0 395.68172   0 983 516.00000 395.68172 23.3%   - 13s
74.   0   0 397.58373   0 916 516.00000 397.58373 22.9%   - 13s
75.   0   0 397.67396   0 948 516.00000 397.67396 22.9%   - 13s
76.   0   0 397.67423   0 955 516.00000 397.67423 22.9%   - 13s
77.   0   0 398.06349   0 1134 516.00000 398.06349 22.9%   - 14s
78.   0   0 398.19319   0 1211 516.00000 398.19319 22.8%   - 14s
79.   0   0 398.19952   0 1211 516.00000 398.19952 22.8%   - 14s
80.   0   0 398.48387   0 1330 516.00000 398.48387 22.8%   - 14s

```
81    0    0 398.50686   0 1301 516.00000 398.50686 22.8%    -   14s
82    0    1 398.50686   0 1293 516.00000 398.50686 22.8%    -   17s
83    28   28 399.84498   9 1257 516.00000 399.10982 22.7% 81.6  23s
84   488  510 402.27669 124 1133 516.00000 399.10982 22.7%  7.1  25s
85  2036 1984 434.47535 471  870 516.00000 399.10982 22.7% 33.1  30s
86  3095 2861 445.09875  20 1301 516.00000 401.55494 22.2% 34.1  36s
87  3098 2863 493.23024 248  522 516.00000 493.23024 4.41% 34.1  44s
88  3103 2867 497.08792 509  428 516.00000 497.08792 3.67% 37.1  45s
89 H 3122 2742              515.0000000 512.46448 0.49% 41.6  48s
```

Cutting planes:
  Learned: 2
  Gomory: 8
  MIR: 13
  Flow cover: 10
  Zero half: 2
  RLT: 1
  Relax-and-lift: 3

Explored 3133 nodes (147751 simplex iterations) in 49.64 seconds (70.44 work units)
Thread count was 8 (of 8 available processors)

Solution count 3: 515 515 515
No other solutions better than 515

Optimal solution found (tolerance 1.00e-04)
Best objective 5.150000000000e+02, best bound 5.150000000000e+02, gap 0.0000%

Output optimal solution and the Optimal Obj: 515.0

Obj = 515.0

Solutions:
    The total pi = 116.0
    The total duration time in berth stage = 139.0
    The total duration time in quay crane scheduling stage = 48.0
    The total departure time in berth stage= 303.0
    The total departure time in quay crane scheduling stage = 212.0
    The total wasted crane work hour according QC0= 4.061939585198222
    The last depature time in quay crane scheduling stage = 68.0

The specific solution are as follows:
    Vessel i: 0: l_i: 6,   pi: 13-19,   ai-di: 12-30,   taoi-deltai: 12-30,   periodi: 18,   taoPi_SP-deltaPi_SP: 12-19,   periodPi: 7, c_i: 4679150,   dowork: 4877414,   fa_i: 2
    Vessel i: 1: l_i: 6,   pi: 28-34,   ai-di: 33-47,   taoi-deltai: 33-47,   periodi: 14,   taoPi_SP-deltaPi_SP: 33-37,   periodPi: 4, c_i: 3566952,   dowork: 3691016,   fa_i: 2
    Vessel i: 2: l_i: 4,   pi: 10-14,   ai-di: 61-85,   taoi-deltai: 61-85,   periodi: 24,   taoPi_SP-deltaPi_SP: 61-68,   periodPi: 7, c_i: 6317195,   dowork: 6459278,   fa_i: 2
    Vessel i: 3: l_i: 4,   pi: 30-34,   ai-di: 3-25,   taoi-deltai: 3-25,   periodi: 22,   taoPi_SP-deltaPi_SP: 3-14,   periodPi: 11, c_i: 5673972,   dowork: 5800168,   fa_i: 1
    Vessel i: 4: l_i: 4,   pi: 10-14,   ai-di: 37-53,   taoi-deltai: 37-52,   periodi: 15,   taoPi_SP-deltaPi_SP: 37-45,   periodPi: 8, c_i: 3787927,   dowork: 3954660,   fa_i: 1
    Vessel i: 5: l_i: 5,   pi: 19-24,   ai-di: 14-41,   taoi-deltai: 14-38,   periodi: 24,   taoPi_SP-deltaPi_SP: 14-21,   periodPi: 7, c_i: 6283001,   dowork: 6459278,   fa_i: 2
    Vessel i: 6: l_i: 7,   pi: 6-13,   ai-di: 4-36,   taoi-deltai: 4-26,   periodi: 22,   taoPi_SP-deltaPi_SP: 4-8,   periodPi: 4, c_i: 5794701,   dowork: 5931990,   fa_i: 5
TimeSolveModel: 57.000000

TimeAll: 60.000000