```
D:\Python\Python\setroute\python.exe "D:\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Python\Pyt
       mode=client --port=37883
  2
  3
       import sys; print('Python %s on %s' % (sys.version, sys.platform))
       paper', 'E:/1 | 0 | 0/3 | 0 | 0/1 | 0 | 0 | 0/1 | 0 | 0 | 0/1 | 0 | 0 | 0/1 | 0 | 0 | 0/1 | 0 | 0 | 0/1 | 0 | 0 | 0/1 | 0 | 0/1 | 0 | 0/1 | 0 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 
  6
       PyDev console: starting.
      Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC v.1929 64 bit (AMD64)] on win32
  8
       main_DM.py', wdir='E:/1 000/3 00000/1 000000/1 000000/1 000000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1
10
       Backend TkAgg is interactive backend. Turning interactive mode on.
11
       Waiting 5s.....
13
       Optimize the ./R 6 9.xlsx instance
14
15
       Set parameter TimeLimit to value 1200
16
       Set parameter PoolSolutions to value 3
17
18
       Set parameter PoolGap to value 0.05
        Set parameter PoolSearchMode to value 2
19
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]
       Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
24
       Optimize a model with 100206 rows, 47910 columns and 292506 nonzeros
25
26
       Model fingerprint: 0xa248ad75
        Variable types: 0 continuous, 47910 integer (40308 binary)
       Coefficient statistics:
28
29
          Matrix range [1e+00, 5e+05]
30
          Objective range [1e+00, 1e+00]
          Bounds range
                                        [1e+00, 1e+00]
31
          RHS range
                                        [1e+00, 7e+06]
33
       Presolve removed 82476 rows and 1965 columns
       Presolve time: 0.15s
       Presolved: 17730 rows, 45945 columns, 51021 nonzeros
35
36
        Variable types: 0 continuous, 45945 integer (38349 binary)
38
       Root relaxation: objective 3.774341e+02, 2166 iterations, 0.08 seconds (0.17 work units)
39
40
            Nodes | Current Node | Objective Bounds
41
        Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
42
43
                     0 377.43412 0 1608
                                                                              - 377.43412
44
       Η
             0
                                                    790.0000000 377.43412 52.2%
45
      H = 0
                       0
                                                    607.0000000 377.43412 37.8%
                                                                                                                               1s
                      46
47
                      48
                      0\ 432.68971\quad 0\ 1600\ 607.00000\ 432.68971\ 28.7\%
49
             0
                      0 432.77421
                                                   0 1438 607.00000 432.77421 28.7%
                                                                                                                                          9s
50
             0
                      0 434.58571
                                                   0 1394 607.00000 434.58571 28.4%
                                                                                                                                    - 15s
51
                      0 434.58632
                                                  0 1414 607.00000 434.58632 28.4%
52
                      0 434.58632
                                                   0 1420 607.00000 434.58632 28.4%
                                                                                                                                    - 15s
53
                      0 434.66489
                                                  0 1292 607.00000 434.66489 28.4%
                                                                                                                                    - 16s
             0
54
                      0 435.02726
                                                  0 1486 607.00000 435.02726 28.3%
                                                                                                                                    - 19s
55
                      0 435.05384
                                                    0 1491 607.00000 435.05384 28.3%
                                                                                                                                    - 19s
56
                      0 435.05523
                                                  0 1487 607.00000 435.05523 28.3%
             0
                                                                                                                                    - 19s
57
             0
                      0 435 05631
                                                   0 1485 607.00000 435.05631 28.3%
                                                                                                                                    - 19s
58
             0
                      0 435.05631
                                                    0 1485 607.00000 435.05631 28.3%
                                                                                                                                    - 19s
                      0 435.09705
                                                  0 1224 607.00000 435.09705 28.3%
60
                      0 435.09705
                                                  0 942 607.00000 435.09705 28.3%
             0
                                                                                                                                   - 20s
61
                      2 435.09705 0 939 607.00000 435.09705 28.3%
           357 371 435.09705 89 1037 607.00000 435.09705 28.3% 32.3
63
          2281 2338 486.85505 599 535 607.00000 435.09705 28.3% 29.9 30s
          3260 3295 509.23785 761 414 607.00000 435.09705 28.3% 30.0 37s
64
          3388 3296 484.54389 143 942 607.00000 435.09705 28.3% 30.5 41s
          3391 3298 589.00000 21 69 607.00000 589.00000 2.97% 30.4 46s
66
          3407 3309 603.53730 26 121 607.00000 603.53730 0.57% 30.3 50s
67
68
69
        Explored 3418 nodes (140173 simplex iterations) in 52.78 seconds (63.22 work units)
70
       Thread count was 8 (of 8 available processors)
72
        Solution count 3: 607 607 607
       No other solutions better than 607
75
       Optimal solution found (tolerance 1.00e-04)
76
       Best objective 6.070000000000e+02, best bound 6.07000000000e+02, gap 0.0000%
       Output optimal solution and the Optimal Obj: 607.0
78
79
80
```

```
unknown
 81 Obj = 607.0
  82
  83 Solutions:
         The total pi = 82.0
 84
  85
         The total duration time in berth stage = 131.0
         The total duration time in quay crane scheduling stage = 28.0
  86
 87
         The total departure time in berth stage= 355.0
         The total departure time in quay crane scheduling stage = 252.0
  88
  89
         The total wasted crane work hour according QC0= 8.292451184172597
  90
         The last depature time in quay crane scheduling stage = 63.0
 91
 92
      The specific solution are as follows:
                                                                                                                                               taoPi_SP-deltaPi_SP: 1
  93
                                   pi: 9-14,
                                                          ai-di: 1-22,
        Vessel i: 0:
                      li: 5,
                                                                                taoi-deltai: 1-20,
                                                                                                                 periodi: 19,
                            periodPi: 4,
                                                               c_i: 4929520,
                                                                                                    dowork: 5800168,
      -5,
                                                                                                                                                 fa_i: 4
 94
        Vessel i: 1:
                       li: 4,
                                   pi: 24-28,
                                                             ai-di: 36-66,
                                                                                      taoi-deltai: 36-64,
                                                                                                                      periodi: 28,
                                                                                                                                                   taoPi_SP-
      deltaPi_SP: 36-44,
                                           periodPi: 8,
                                                                              c_i: 7260454,
                                                                                                                    dowork: 7382032,
                                                                                                                                                                fa_i: 2
                      li: 7,
        Vessel i: 2:
                                   pi: 17-24,
                                                            ai-di: 58-76,
                                                                                     taoi-deltai: 58-74,
                                                                                                                      periodi: 16,
                                                                                                                                                    taoPi SP-
      deltaPi_SP: 58-60,
                                           periodPi: 2,
                                                                                                                   dowork: 4745592,
                                                                              c_i: 4163291,
                                                                                                                                                                fa_i: 7
        Vessel i: 3:
                      li: 6,
                                   pi: 6-12,
                                                          ai-di: 40-68,
                                                                                   taoi-deltai: 40-66,
                                                                                                                   periodi: 26,
                                                                                                                                                 taoPi_SP-deltaPi_SP
      : 40-45,
                                 periodPi: 5,
                                                                    c i: 6657387,
                                                                                                          dowork: 7250210,
                                                                                                                                                      fa i: 5
                                                            ai-di: 60-83,
                                                                                                                      periodi: 21,
        Vessel i: 4:
                       li: 5,
                                   pi: 12-17,
                                                                                     taoi-deltai: 60-81,
                                                                                                                                                    taoPi_SP-
      deltaPi_SP: 60-63,
                                           periodPi: 3,
                                                                              c_i: 5517711,
                                                                                                                   dowork: 5536524,
                                                                                                                                                                fa_i: 5
        Vessel i: 5: li: 6,
                                   pi: 14-20,
                                                            ai-di: 29-54,
                                                                                     taoi-deltai: 29-50,
                                                                                                                      periodi: 21,
                                                                                                                                                    taoPi_SP-
      deltaPi SP: 29-35,
                                           periodPi: 6,
                                                                                                                   dowork: 5404702,
                                                                              c i: 5404610,
                                                                                                                                                                fa_i: 2
 99
     TimeSolveModel: 60.000000
100
101 TimeAll: 63.000000
102
103
```