```
"E:\1 □□□□\3 □□□□□\1 □□□□□□\1 □□□□□□□□\1_□□□□□□_□□□□\1_LW _□□□□\4 □□□□\3 python_code\1 exzample\2 □□□□□□\9 Code for this paper\Scripts\python.exe" "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\pydevconsole.py" --mode=client --port=59342

import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['E:\\1 □□□□\\3 □□□□□\\1 □□□□□□\\1 □□□□□□□□\\1_□□□□□□_□□□□\\1_LW _□□□□\\4 □□□□\\3 python_code\\9 Code for this paper', 'E:/1 □□□□/3 □□□□□/1 □□□□□□/1 □□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper'])

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
>>> runfile('E:/1 □□□□/3 □□□□□/1 □□□□□□/1 □□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper/main_DM.py', wdir='E:/1 □□□□/3 □□□□□/1 □□□□□□/1 □□□□□□□□/1_□□□□□□_□□□□/1_LW _□□□□/4 □□□□/3 python_code/9 Code for this paper')
Backend TkAgg is interactive backend. Turning interactive mode on.
Waiting 5s.....
Set parameter TimeLimit to value 3600
Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)

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

Optimize a model with 613360 rows, 47910 columns and 1811124 nonzeros
Model fingerprint: 0x3659f940
Variable types: 0 continuous, 47910 integer (40308 binary)
Coefficient statistics:
  Matrix range     [1e-01, 1e+15]
  Objective range  [1e+00, 5e+01]
  Bounds range     [1e+00, 1e+00]
  RHS range        [1e+00, 2e+15]
Warning: Model contains large matrix coefficient range
Warning: Model contains large rhs
         Consider reformulating model or setting NumericFocus parameter
         to avoid numerical issues.
Presolve removed 375874 rows and 22993 columns (presolve time = 5s) ...
Presolve removed 398086 rows and 24107 columns (presolve time = 10s) ...
Presolve removed 398086 rows and 24107 columns (presolve time = 15s) ...
Presolve removed 398086 rows and 24107 columns (presolve time = 20s) ...
Presolve removed 513963 rows and 32564 columns
Presolve time: 24.69s
Presolved: 99397 rows, 15346 columns, 353759 nonzeros
Variable types: 0 continuous, 15346 integer (15070 binary)

Deterministic concurrent LP optimizer: primal and dual simplex (primal and dual model)
Showing first log only...

Root relaxation presolved: 15336 rows, 114713 columns, 368193 nonzeros


Root simplex log...

Iteration    Objective       Primal Inf.    Dual Inf.      Time
       0   -1.0968000e+04   0.000000e+00   1.678365e+05     27s
Concurrent spin time: 0.20s

Solved with dual simplex (primal model)

Root relaxation: objective 5.606454e+02, 2665 iterations, 1.80 seconds (1.42 work units)

    Nodes    |    Current Node    |     Objective Bounds      |     Work
 Expl Unexpl |  Obj  Depth IntInf | Incumbent    BestBd   Gap | It/Node Time

     0     0  560.64537    0  407          -  560.64537      -     -   30s
     0     0  570.45660    0  572          -  570.45660      -     -   34s
     0     0  572.00000    0  221          -  572.00000      -     -   35s
     0     0  573.07355    0  678          -  573.07355      -     -   37s
     0     0  573.55754    0  645          -  573.55754      -     -   37s
     0     0  573.69978    0  631          -  573.69978      -     -   38s
     0     0  573.83460    0  640          -  573.83460      -     -   38s
     0     0  573.96499    0  634          -  573.96499      -     -   39s
     0     0  574.09143    0  608          -  574.09143      -     -   39s
     0     0  574.21428    0  600          -  574.21428      -     -   39s
     0     0  574.33390    0  593          -  574.33390      -     -   40s
     0     0  574.45055    0  589          -  574.45055      -     -   40s
     0     0  574.56450    0  579          -  574.56450      -     -   41s
     0     0  574.67596    0  578          -  574.67596      -     -   41s
     0     0  574.78512    0  575          -  574.78512      -     -   41s
     0     0  574.89215    0  570          -  574.89215      -     -   41s
     0     0  574.99721    0  566          -  574.99721      -     -   42s
     0     0  575.10042    0  608          -  575.10042      -     -   43s
     0     0  575.20192    0  596          -  575.20192      -     -   43s
     0     0  575.33333    0  177          -  575.33333      -     -   44s
     0     0  575.33333    0  177          -  575.33333      -     -   44s
     0     0  575.51651    0  631          -  575.51651      -     -   46s
```

```
 80     0    0 575.51651   0 685         - 575.51651    -    -  47s
 81     0    0 575.59611   0 655         - 575.59611    -    -  47s
 82     0    0 575.72489   0 878         - 575.72489    -    -  48s
 83     0    0 575.82218   0 1134        - 575.82218    -    -  48s
 84     0    0 575.82218   0 1054        - 575.82218    -    -  48s
 85     0    0 578.13476   0 531         - 578.13476    -    -  50s
 86     0    0 578.42818   0 755         - 578.42818    -    -  51s
 87     0    0 578.74309   0 717         - 578.74309    -    -  52s
 88     0    0 578.93906   0 962         - 578.93906    -    -  52s
 89     0    0 579.11511   0 849         - 579.11511    -    -  53s
 90     0    0 579.26379   0 648         - 579.26379    -    -  53s
 91     0    0 579.33050   0 660         - 579.33050    -    -  54s
 92     0    0 579.40965   0 710         - 579.40965    -    -  54s
 93     0    0 579.42588   0 538         - 579.42588    -    -  54s
 94     0    0 579.42588   0 584         - 579.42588    -    -  55s
 95     0    0 584.37193   0 1339        - 584.37193    -    -  58s
 96     0    0 584.37193   0 1338        - 584.37193    -    -  58s
 97     0    0 584.53513   0 1189        - 584.53513    -    -  60s
 98     0    0 584.53513   0 1185        - 584.53513    -    -  60s
 99     0    0 584.84743   0 793         - 584.84743    -    -  60s
100     0    0 584.86350   0 783         - 584.86350    -    -  61s
101     0    0 584.86350   0 767         - 584.86350    -    -  61s
102     0    0 585.40794   0 541         - 585.40794    -    -  63s
103     0    0 585.40794   0 522         - 585.40794    -    -  63s
104     0    0 585.42160   0 512         - 585.42160    -    -  64s
105     0    0 585.43544   0 510         - 585.43544    -    -  64s
106     0    0 585.43544   0 510         - 585.43544    -    -  65s
107     0    0 585.79853   0 683         - 585.79853    -    -  67s
108     0    0 585.90205   0 688         - 585.90205    -    -  68s
109     0    0 585.90205   0 691         - 585.90205    -    -  69s
110     0    0 585.94372   0 830         - 585.94372    -    -  72s
111     0    0 585.94372   0 828         - 585.94372    -    -  73s
112     0    0 585.96155   0 637         - 585.96155    -    -  74s
113     0    0 585.96155   0 575         - 585.96155    -    -  74s
114     0    0 586.98491   0 851         - 586.98491    -    -  77s
115     0    0 587.14221   0 820         - 587.14221    -    -  77s
116     0    0 587.15470   0 777         - 587.15470    -    -  78s
117     0    0 587.15770   0 845         - 587.15770    -    -  78s
118     0    0 587.15770   0 856         - 587.15770    -    -  80s
119     0    0 587.15770   0 786         - 587.15770    -    -  81s
120     0    0 587.23999   0 641         - 587.23999    -    -  83s
121     0    0 587.24910   0 712         - 587.24910    -    -  84s
122     0    0 587.25066   0 705         - 587.25066    -    -  85s
123     0    0 587.29047   0 652         - 587.29047    -    -  87s
124     0    0 587.31018   0 620         - 587.31018    -    -  88s
125     0    0 587.31018   0 617         - 587.31018    -    -  88s
126     0    0 587.31095   0 703         - 587.31095    -    -  89s
127     0    0 587.31242   0 780         - 587.31242    -    -  91s
128     0    0 587.31242   0 677         - 587.31242    -    -  91s
129     0    0 587.31242   0 673         - 587.31242    -    -  92s
130     0    0 587.35292   0 627         - 587.35292    -    -  95s
131     0    0 587.35292   0 395         - 587.35292    -    -  97s
132  H  0    0             592.0000000 587.35292  0.78%    -   99s
133     0    0 587.35292   0 395 592.00000 587.35292  0.78%    -   99s
134
135  Cutting planes:
136    Learned: 582
137    Gomory: 3
138    Lift-and-project: 1
139    Cover: 414
140    Implied bound: 49
141    Clique: 21
142    MIR: 334
143    StrongCG: 35
144    Flow cover: 7
145    GUB cover: 60
146    Zero half: 13
147    RLT: 95
148    Relax-and-lift: 523
149    BQP: 12
150
151  Explored 1 nodes (36705 simplex iterations) in 99.61 seconds (88.85 work units)
152  Thread count was 8 (of 8 available processors)
153
154  Solution count 1: 592
155
156  Optimal solution found (tolerance 1.00e-04)
157  Best objective 5.920000000000e+02, best bound 5.920000000000e+02, gap 0.0000%
158  Optimal Obj:  592.0
159  Obj = 592.0
160  Solutions
161  Vessel i: 0:     li: 5,     pi: 9-14,     ai-di: 8-25,     taoi-deltai: 8-23,     periodi: 15,     taoPi_SP-deltaPi_SP: 8-12,     periodPi: 4,     betaNi: 8,     bi: 15,     Txijt:
       75,     o1i: 75,     o2i: 80,     o3i: -275,     o4i: 160,     Ti: 40
162  Vessel i: 1:     li: 6,     pi: 19-25,     ai-di: 20-40,     taoi-deltai: 20-38,     periodi: 18,     taoPi_SP-deltaPi_SP: 20-26,     periodPi: 6,     betaNi: 10,     bi: 18,
```

Txijt: 108, o1i: 108, o2i: 120, o3i: -312, o4i: 200, Ti: 116
Vessel i: 2: li: 5, pi: 14-19, ai-di: 22-41, taoi-deltai: 22-38, periodi: 16, taoPi_SP-deltaPi_SP: 22-28, periodPi: 6, betaNi: 10, bi: 16,
Txijt: 80, o1i: 80, o2i: 120, o3i: -250, o4i: 200, Ti: 150
Vessel i: 3: li: 7, pi: 27-34, ai-di: 29-57, taoi-deltai: 29-51, periodi: 22, taoPi_SP-deltaPi_SP: 29-35, periodPi: 6, betaNi: 13, bi: 22,
Txijt: 154, o1i: 154, o2i: 120, o3i: -432, o4i: 260, Ti: 102
Vessel i: 4: li: 6, pi: 8-14, ai-di: 35-68, taoi-deltai: 35-56, periodi: 21, taoPi_SP-deltaPi_SP: 35-41, periodPi: 6, betaNi: 12, bi: 21,
Txijt: 126, o1i: 126, o2i: 120, o3i: -390, o4i: 240, Ti: 96
Vessel i: 5: li: 7, pi: 15-22, ai-di: 42-68, taoi-deltai: 42-53, periodi: 11, taoPi_SP-deltaPi_SP: 42-46, periodPi: 4, betaNi: 6, bi: 11,
Txijt: 77, o1i: 77, o2i: 80, o3i: -189, o4i: 120, Ti: 88
TimeSolveModel: 143.000000

TimeAll: 147.000000