```
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=7213
     import sys; print('Python %s on %s' % (sys.version, sys.platform))
 4
     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
     >>> runfile('E:/1 000/3 0000/1 00000/1 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 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 000000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 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 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 000000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 00000/1 0
     Code for this paper')
    Backend TkAgg is interactive backend. Turning interactive mode on.
     Waiting 5s....
     Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
12
13
    CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
15
     Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
16
17
     Optimize a model with 626517 rows, 47910 columns and 1842815 nonzeros
     Model fingerprint: 0x1b1edf27
     Variable types: 0 continuous, 47910 integer (40308 binary)
20 Coefficient statistics:
21
      Matrix range [1e-01, 1e+15]
      Objective range [1e+00, 5e+01]
      Bounds range [1e+00, 1e+00]
23
24
      RHS range
                           [1e+00, 2e+15]
     Warning: Model contains large matrix coefficient range
26
     Warning: Model contains large rhs
27
            Consider reformulating model or setting NumericFocus parameter
28
            to avoid numerical issues.
29
     Presolve removed 414660 rows and 23384 columns (presolve time = 5s) ...
30
     Presolve removed 430213 rows and 24440 columns (presolve time = 10s) ...
31
     Presolve removed 430213 rows and 24440 columns (presolve time = 15s) ...
     Presolve removed 540413 rows and 32930 columns
     Presolve time: 17.43s
     Presolved: 86104 rows, 14980 columns, 307278 nonzeros
34
35
     Variable types: 0 continuous, 14980 integer (14700 binary)
     Deterministic concurrent LP optimizer: primal and dual simplex (primal and dual model)
37
38
     Showing first log only..
39
40
     Root relaxation presolved: 14972 rows, 101060 columns, 321626 nonzeros
41
42
43
     Root simplex log...
44
45
     Iteration Objective
                                    Primal Inf. Dual Inf.
                                                                     Time
          0 -9.5110000e+03 0.000000e+00 1.299471e+05
46
47
     Concurrent spin time: 0.40s
48
49
     Solved with dual simplex (primal model)
50
51
     Root relaxation: objective 1.068723e+03, 3380 iterations, 1.97 seconds (1.44 work units)
52
53
        Nodes | Current Node | Objective Bounds
                                                                                Work
54
      Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
55
56
         0
              0 1068.72339 0 376
                                                   - 1068.72339
                                                                                 228
57
         0
              0 1073.42764
                                   0 635
                                                   - 1073.42764
                                                                                 25s
58
              0 1073.42764
                                   0 629
                                                   - 1073.42764
                                                                                 25s
59
              0 1087.20270 0 847
                                                                                 29s
         0
                                                   - 1087.20270
60
         0
              0 1087.20270 0 840
                                                   - 1087.20270
                                                                                 29s
              0 1087.21314
                                  0 938
                                                   - 1087.21314
                                                                                 30s
61
62
         0
              0 1087.21813 0 912
                                                   - 1087.21813
                                                                                 30s
63
              0.1087.23439
                                  0.919
                                                   - 1087 23439
                                                                                 30s
         0
64
              0 1087.23439 0 879
                                                   - 1087.23439
                                                                                 31s
65
              0 1087.93283
                                   0 916
                                                   - 1087.93283
                                                                                 34s
                                                   - 1087.93283
66
              0 1087.93283
                                 0 823
                                                                                 34s
         0
67
         0
              0 1088.00239
                                   0 586
                                                   - 1088.00239
                                                                                 36s
68
         0
              0 1088.00239
                                   0 581
                                                   - 1088.00239
                                                                                 36s
69
              0 1088.00239
                                  0.557
                                                   - 1088.00239
                                                                                 37s
70
                                   0.551
         0
              0.1088.00239
                                                   - 1088 00239
                                                                                 37s
71
         0
              0 1088.20446
                                  0 729
                                                   - 1088.20446
                                                                                 40s
              0 1088.65175
                                  0 811
                                                   - 1088.65175
                                                                                 42s
73
         0
              0 1089.01844
                                   0 688
                                                   - 1089.01844
                                                                                 42s
74
         0
              0 1089.06096 0 682
                                                   - 1089.06096
                                                                                 43s
75
              0 1089.06096
                                  0 675
                                                   - 1089.06096
                                                                                 43s
76
              0 1092.86113
                                   0 914
                                                   - 1092.86113
                                                                                 46s
                                 0 904
                                                   - 1092.86113
                                                                                 46s
77
         0
              0 1092.86113
78
         0
              0 1093.88962 0 677
                                                   - 1093.88962
                                                                             -
                                                                                 47s
         0
              0 1093.88962
                                                   - 1093.88962
79
                                   0 668
                                                                                 475
```

```
0 1095.66667
                         0 402
                                     - 1095.66667
                                                          48s
 80
 81
           0 1095.66667
                          0.381
                                     - 1095.66667
                                                          48s
                          0.377
                                     - 1095.66667
                                                          48s
 82
           0.1095.66667
 83
       0
           0 1095.66667
                         0 466
                                     - 1095.66667
                                                          50s
                                     - 1095.66667
           0 1095.66667
                          0 525
                                                          51s
 84
 85
       0
           0 1095.66667
                         0 550
                                     - 1095.66667
                                                          53s
                                     - 1095.66667
           0 1095.66667
                         0.549
                                                          53s
 86
       0
 87
       0
           0 1095.66667
                         0 536
                                     - 1095.66667
                                                          54s
 88
       0
           0 1095.66667
                          0 529
                                     - 1095.66667
                                                          54s
           0 1095.66667
                                     - 1095.66667
 89
                         0.159
                                                          58s
       0
 90
                                                          59s
       0
           0 1095.66667
                         0.285
                                     - 1095.66667
 91
       0
           0 1095.66667
                         0 279
                                     - 1095.66667
                                                          59s
 92
           0 1095.66667
                          0 187
                                     - 1095.66667
                                                          62s
 93
           0 1095.66667
                         0.345
                                     - 1095.66667
                                                          63s
       0
 94
       0
           0.1095.66667
                         0 337
                                     - 1095.66667
                                                          63s
 95
           0 1095.66667
                                     - 1095.66667
                          0 117
                                                          66s
 96
       0
           0 1095.66667
                         0 196
                                     - 1095.66667
                                                          67s
 97
           0.1095.66667
                                     - 1095.66667
       0
                         0 199
                                                          67s
 98
           0 1095.66667
                         0 107
                                     - 1095.66667
                                                          69s
 99
       0
           0.1095.66667
                         0 107
                                     - 1095.66667
                                                          70s
100
           2 1095,66667
                                     - 1095,66667
                                                          79s
       0
                         0 103
101
       1
           4 1095.66667 1 100
                                     - 1095.66667
                                                     - 947 80s
102
           20 1095.66667
                                      - 1095.66667
                          5 170
                                                     - 1228 85s
103
       27
           32 1095.66667
                           7 165
                                      - 1095.66667
                                                     - 1016 90s
104
       40
           46 1095.66667 9 165
                                      - 1095.66667
                                                      - 924 95s
105
       58
           74 1095.66667 13 162
                                       - 1095.66667
                                                      - 822 100s
           121 1095.66667 23 161
                                       - 1095.66667
106
                                                      - 488 105s
           170 1109.00000 31 149
107
      150
                                        - 1095,66667
                                                       - 408 113s
108
      186
           201 1107.46154 36 288
                                        - 1095.66667
                                                       - 356 117s
109
      228 240 1109.00000 44 112
                                        - 1095.66667
                                                         298 122s
110
      272
           271 1109.00000 48 117
                                        - 1095.66667
                                                         276 126s
                       51 1109.0000000 1095.66667 1.20% 282 126s
      276 244
111
112
      330 223
                 cutoff 57
                              1109.00000 1095.66667 1.20% 247 130s
           219 1095.66667 8 99 1109.00000 1095.66667 1.20% 281 138s
113
      404
114
      439
           225 1103.44444 13 373 1109.00000 1095.66667 1.20% 286 142s
           226 1096.36842 17 171 1109.00000 1095.66667 1.20% 300 146s
115
      481
116
      529
           252 1096.31429 17 313 1109.00000 1095.66667 1.20% 305 152s
      640 231 1107.00000 39 107 1109.00000 1095.66667 1.20% 273 180s
117
118
119 Explored 640 nodes (216178 simplex iterations) in 180.22 seconds (216.54 work units)
120 Thread count was 8 (of 8 available processors)
121
122 Solution count 1: 1109
123
    Optimal solution found (tolerance 1.00e-04)
124
125 Best objective 1.109000000000e+03, best bound 1.10900000000e+03, gap 0.0000%
126 Optimal Obj: 1109.0
127 \text{ Obj} = 1109.0
128 Solutions
                                                  taoi-deltai: 8-25, periodi: 17, taoPi SP-deltaPi SP: 8-13, periodPi: 5,
129 Vessel i: 0:
                  li: 7,
                          pi: 7-14,
                                    ai-di: 8-25,
                                                                                                                          betaNi: 10, bi: 17, Txijt:
           o1i: 119, o2i: 100, o3i: -324, o4i: 200, Ti: 95
    Vessel i: 1: li: 6, pi: 22-28,
                                      ai-di: 14-24,
                                                                                      taoPi_SP-deltaPi_SP: 14-18,
                                                    taoi-deltai: 14-25,
                                                                        periodi: 11,
                                                                                                                   periodPi: 4,
                                                                                                                                 betaNi: 6,
                                                                                                                                             bi: 11,
                o1i: 86, o2i: 80, o3i: -182, o4i: 120, Ti: 104
     Txiit: 66.
                                                                                      taoPi_SP-deltaPi_SP: 14-31,
    Vessel i: 2:
                 li: 6,
                         pi: 14-20,
                                      ai-di: 14-49,
                                                   taoi-deltai: 14-47.
                                                                        periodi: 33,
                                                                                                                   periodPi: 17,
                                                                                                                                  betaNi: 21,
                                                                                                                                               bi: 33,
     Txijt: 198,
                 o1i: 198, o2i: 340, o3i: -416, o4i: 420, Ti: 542
                         pi: 29-34,
    Vessel i: 3:
                 li: 5,
                                      ai-di: 22-48, taoi-deltai: 22-49,
                                                                        periodi: 27,
                                                                                      taoPi SP-deltaPi SP: 22-31,
                                                                                                                   periodPi: 9,
                                                                                                                                 betaNi: 15,
                                                                                                                                              bi: 27,
                 o1i: 155, o2i: 180, o3i: -450, o4i: 300, Ti: 185
     Txijt: 135,
133
    Vessel i: 4:
                 li: 6,
                         pi: 23-29,
                                      ai-di: 43-56,
                                                    taoi-deltai: 43-53,
                                                                        periodi: 10,
                                                                                      taoPi_SP-deltaPi_SP: 43-46,
                                                                                                                   periodPi: 3,
                                                                                                                                 betaNi: 6,
                                                                                                                                             bi: 10,
     Txijt: 60,
                o1i: 60,
                         o2i: 60, o3i: -182, o4i: 120, Ti: 58
                         pi: 9-14,
                                    ai-di: 35-75, taoi-deltai: 35-69,
    Vessel i: 5:
                                                                       periodi: 34,
                                                                                    taoPi_SP-deltaPi_SP: 35-44,
                li: 5.
                                                                                                                  periodPi: 9.
                                                                                                                                betaNi: 20.
                                                                                                                                             bi: 34.
                 o1i: 170, o2i: 180,
     Txiit: 170.
                                      o3i: -625,
                                                  o4i: 400, Ti: 125
135
    TimeSolveModel: 208.000000
136
137
138
139 TimeAll: 212.000000
140
141
142
143
```