

```

1 "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=8836
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1 \ \ \ \ \ \3 \ \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \ \4 \ \ \ \ \ \3 python_code\9 Code for this
  paper', 'E:/1 \ \ \ \ \ \3 \ \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \ \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 \_LW\_ \ \ \ \ \ \4 \ \ \ \ \ \3 python_code/9 Code for this paper/
  main_RO_TWS.py', wdir='E:/1 \ \ \ \ \ \3 \ \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \ \4 \ \ \ \ \ \3 python_code/9 Code for
  this paper')
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11 Waiting 5s.....
12 Set parameter MIPGap to value 1e-10
13 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
14
15 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
16 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
17
18 Optimize a model with 602799 rows, 52642 columns and 1675285 nonzeros
19 Model fingerprint: 0xc5c8e864
20 Variable types: 1 continuous, 52641 integer (52605 binary)
21 Coefficient statistics:
22   Matrix range    [1e+00, 1e+10]
23   Objective range [1e+00, 2e+01]
24   Bounds range   [1e+00, 1e+00]
25   RHS range      [1e+00, 2e+10]
26 Warning: Model contains large matrix coefficients
27 Warning: Model contains large rhs
28     Consider reformulating model or setting NumericFocus parameter
29     to avoid numerical issues.
30 Presolve removed 381477 rows and 26559 columns (presolve time = 5s) ...
31 Presolve removed 526889 rows and 37081 columns
32 Presolve time: 8.85s
33 Presolved: 75910 rows, 15561 columns, 248987 nonzeros
34 Variable types: 0 continuous, 15561 integer (15534 binary)
35
36 Deterministic concurrent LP optimizer: primal and dual simplex (primal and dual model)
37 Showing first log only...
38
39 Root relaxation presolved: 15561 rows, 91471 columns, 264548 nonzeros
40
41
42 Root simplex log...
43
44 Iteration   Objective    Primal Inf.   Dual Inf.    Time
45      0  8.4600000e+02  0.0000000e+00  1.0360000e+03   9s
46 Concurrent spin time: 0.00s
47
48 Solved with dual simplex (primal model)
49
50 Root relaxation: objective 8.460000e+02, 2529 iterations, 0.47 seconds (0.40 work units)
51 Total elapsed time = 10.15s
52
53   Nodes | Current Node | Objective Bounds | Work
54 Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
55
56      0  0 846.00000  0 19      - 846.00000      - - 10s
57 H  0  0      3806.000000 846.00000 77.8% - 10s
58      0  0 846.00000  0 174 3806.00000 846.00000 77.8% - 11s
59      0  0 846.00000  0 168 3806.00000 846.00000 77.8% - 11s
60 H  0  0      1786.000000 846.00000 52.6% - 11s
61 H  0  0      1206.000000 846.00000 29.9% - 11s
62      0  0 846.00000  0 154 1206.00000 846.00000 29.9% - 11s
63      0  0 846.00000  0 153 1206.00000 846.00000 29.9% - 12s
64      0  0 846.00000  0 11 1206.00000 846.00000 29.9% - 13s
65      0  0 846.00000  0 20 1206.00000 846.00000 29.9% - 13s
66      0  0 846.00000  0 82 1206.00000 846.00000 29.9% - 13s
67      0  0 846.00000  0 16 1206.00000 846.00000 29.9% - 15s
68      0  0 846.00000  0 19 1206.00000 846.00000 29.9% - 15s
69      0  0 846.00000  0 20 1206.00000 846.00000 29.9% - 16s
70      0  0 846.00000  0 20 1206.00000 846.00000 29.9% - 17s
71      0  2 846.00000  0 20 1206.00000 846.00000 29.9% - 20s
72 H 30 32      1106.000000 846.00000 23.5% 478 23s
73      44 47 846.00000  10 25 1106.00000 846.00000 23.5% 531 25s
74 H 66 67      846.000000 846.00000 0.00% 618 27s
75
76 Cutting planes:
77   Cover: 162
78   Implied bound: 1841
79   Clique: 7

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80  MIR: 41
81  StrongCG: 24
82  GUB cover: 5
83  Zero half: 1
84  RLT: 5
85  Relax-and-lift: 644
86
87  Explored 80 nodes (70377 simplex iterations) in 27.15 seconds (47.23 work units)
88  Thread count was 8 (of 8 available processors)
89
90  Solution count 5: 846 1106 1206 ... 3806
91
92  Optimal solution found (tolerance 1.00e-10)
93  Best objective 8.460000000000e+02, best bound 8.460000000000e+02, gap 0.0000%
94  Set parameter MIPGap to value 1e-08
95  Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
96
97  CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
98  Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
99
100 Optimize a model with 536248 rows, 14427 columns and 1098671 nonzeros
101 Model fingerprint: 0x3404a901
102 Variable types: 36 continuous, 14391 integer (8316 binary)
103 Coefficient statistics:
104   Matrix range    [1e-01, 1e+10]
105   Objective range [6e-05, 5e+01]
106   Bounds range   [1e+00, 1e+00]
107   RHS range      [8e-01, 1e+10]
108 Warning: Model contains large matrix coefficients
109 Warning: Model contains large rhs
110   Consider reformulating model or setting NumericFocus parameter
111   to avoid numerical issues.
112 Presolve removed 533447 rows and 13375 columns
113 Presolve time: 0.41s
114 Presolved: 2801 rows, 1052 columns, 7492 nonzeros
115 Variable types: 5 continuous, 1047 integer (623 binary)
116 Found heuristic solution: objective 3368.0500186
117 Found heuristic solution: objective 3454.0500186
118
119 Root relaxation: objective 4.685050e+03, 802 iterations, 0.02 seconds (0.01 work units)
120
121   Nodes | Current Node | Objective Bounds | Work
122   Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
123
124   0   0 4685.05002   0 27 3454.05002 4685.05002 35.6% - 0s
125 H   0   0           4658.0500186 4685.05002 0.58% - 0s
126 H   0   0           4678.0500186 4685.05002 0.15% - 0s
127 *   0   0           0 4685.0500186 4685.05002 0.00% - 0s
128
129 Cutting planes:
130   Learned: 6
131   Mod-K: 1
132
133 Explored 1 nodes (1211 simplex iterations) in 0.58 seconds (0.78 work units)
134 Thread count was 8 (of 8 available processors)
135
136 Solution count 5: 4685.05 4678.05 4658.05 ... 3368.05
137
138 Optimal solution found (tolerance 1.00e-08)
139 Best objective 4.685050018628e+03, best bound 4.685050018628e+03, gap 0.0000%
140 SP is solved
141 SP's optimal solution is'□4685
142
143 Itr = 0
144 Collect_LB = [846.0]
145 Collect_UB = [10216.10003725563]
146 Collect_Hua = [0.0]
147 Collect_SPObjVal = [4685.050018627815]
148 Collect_MPObjValNHua = [846.0]
149
150
151 Set parameter MIPGap to value 1e-10
152 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
153
154 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
155 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
156
157 Optimize a model with 609508 rows, 283978 columns and 1682030 nonzeros
158 Model fingerprint: 0xaf87501e
159 Variable types: 1 continuous, 283977 integer (283941 binary)
160 Coefficient statistics:
161   Matrix range    [1e+00, 1e+10]
162   Objective range [1e+00, 2e+01]
163   Bounds range   [1e+00, 1e+00]

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164 RHS range [1e+00, 2e+10]
165 Warning: Model contains large matrix coefficients
166 Warning: Model contains large rhs
167 Consider reformulating model or setting NumericFocus parameter
168 to avoid numerical issues.
169 Presolve removed 442590 rows and 265694 columns (presolve time = 5s) ...
170 Presolve removed 559145 rows and 275982 columns
171 Presolve time: 9.55s
172 Presolved: 50363 rows, 7996 columns, 128306 nonzeros
173 Variable types: 0 continuous, 7996 integer (7969 binary)
174 Root relaxation presolved: 7996 rows, 58359 columns, 136302 nonzeros
175
176
177 Root simplex log...
178
179 Iteration Objective Primal Inf. Dual Inf. Time
180 0 handle free variables 10s
181 2054 4.3560835e+32 1.136138e+33 4.356084e+02 10s
182 7699 5.5310500e+03 0.000000e+00 0.000000e+00 11s
183 7699 5.5310500e+03 0.000000e+00 0.000000e+00 11s
184
185 Root relaxation: objective 5.531050e+03, 7699 iterations, 1.62 seconds (2.53 work units)
186
187 Nodes | Current Node | Objective Bounds | Work
188 Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
189
190 0 0 5531.05002 0 11 - 5531.05002 - - 11s
191 0 0 5531.05002 0 224 - 5531.05002 - - 13s
192 0 0 5531.05002 0 152 - 5531.05002 - - 13s
193 0 0 5531.05002 0 152 - 5531.05002 - - 13s
194 0 0 5531.05002 0 31 - 5531.05002 - - 15s
195 0 0 5531.05002 0 57 - 5531.05002 - - 15s
196 0 0 5531.05002 0 111 - 5531.05002 - - 17s
197 0 0 5531.05002 0 141 - 5531.05002 - - 17s
198 0 0 5531.05002 0 15 - 5531.05002 - - 20s
199 H 0 0 9531.0500186 5531.05002 42.0% - 20s
200 0 0 5531.05002 0 13 9531.05002 5531.05002 42.0% - 20s
201 H 0 0 5531.0500186 5531.05002 0.00% - 20s
202 0 0 5531.05002 0 13 5531.05002 5531.05002 0.00% - 20s
203
204 Cutting planes:
205 Learned: 1
206 Gomory: 2
207 Cover: 132
208 Implied bound: 36
209 Clique: 1630
210 MIR: 41
211 StrongCG: 10
212 GUB cover: 43
213 RLT: 6
214 Relax-and-lift: 8
215 BQP: 9
216
217 Explored 1 nodes (45069 simplex iterations) in 20.80 seconds (28.31 work units)
218 Thread count was 8 (of 8 available processors)
219
220 Solution count 2: 5531.05 9531.05
221
222 Optimal solution found (tolerance 1.00e-10)
223 Best objective 5.531050018628e+03, best bound 5.531050018628e+03, gap 0.0000%
224 Set parameter MIPGap to value 1e-08
225 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
226
227 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
228 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
229
230 Optimize a model with 536248 rows, 14427 columns and 1098671 nonzeros
231 Model fingerprint: 0x313d8092
232 Variable types: 36 continuous, 14391 integer (8316 binary)
233 Coefficient statistics:
234 Matrix range [1e-01, 1e+10]
235 Objective range [6e-05, 5e+01]
236 Bounds range [1e+00, 1e+00]
237 RHS range [8e-01, 1e+10]
238 Warning: Model contains large matrix coefficients
239 Warning: Model contains large rhs
240 Consider reformulating model or setting NumericFocus parameter
241 to avoid numerical issues.
242 Presolve removed 531123 rows and 12728 columns
243 Presolve time: 0.41s
244 Presolved: 5125 rows, 1699 columns, 13666 nonzeros
245 Variable types: 8 continuous, 1691 integer (967 binary)
246 Found heuristic solution: objective 3516.0500186
247 Found heuristic solution: objective 3536.0500186

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248
249 Root relaxation: objective 5.133193e+03, 1482 iterations, 0.02 seconds (0.02 work units)
250
251   Nodes | Current Node | Objective Bounds | Work
252 Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
253
254 H 0 0          5133.1928758 15078.7410 194% - 0s
255   0 0 - 0      5133.19288 5133.19288 0.00% - 0s
256
257 Explored 1 nodes (1865 simplex iterations) in 0.58 seconds (0.83 work units)
258 Thread count was 8 (of 8 available processors)
259
260 Solution count 3: 5133.19 3536.05 3516.05
261
262 Optimal solution found (tolerance 1.00e-08)
263 Best objective 5.133192875771e+03, best bound 5.133192875771e+03, gap 0.0000%
264 SP is solved
265 SP's optimal solution is'□5133
266
267 Itr = 1
268 Collect_LB = [846.0, 5531.050018627815]
269 Collect_UB = [10216.10003725563, 5979.19287577067]
270 Collect_Hua = [0.0, 4685.050018627815]
271 Collect_SPObjVal = [4685.050018627815, 5133.19287577067]
272 Collect_MPObjValNHua = [846.0, 846.0]
273
274
275 Set parameter MIPGap to value 1e-10
276 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
277
278 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
279 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
280
281 Optimize a model with 609508 rows, 283978 columns and 1682030 nonzeros
282 Model fingerprint: 0x49dbf7ef
283 Variable types: 1 continuous, 283977 integer (283941 binary)
284 Coefficient statistics:
285   Matrix range    [1e+00, 1e+10]
286   Objective range [1e+00, 2e+01]
287   Bounds range   [1e+00, 1e+00]
288   RHS range      [1e+00, 2e+10]
289 Warning: Model contains large matrix coefficients
290 Warning: Model contains large rhs
291   Consider reformulating model or setting NumericFocus parameter
292   to avoid numerical issues.
293 Presolve removed 446094 rows and 266092 columns (presolve time = 5s) ...
294 Presolve removed 560047 rows and 276105 columns
295 Presolve time: 8.87s
296 Presolved: 49461 rows, 7873 columns, 126056 nonzeros
297 Variable types: 0 continuous, 7873 integer (7846 binary)
298 Root relaxation presolved: 7873 rows, 57334 columns, 133929 nonzeros
299
300
301 Root simplex log...
302
303 Iteration Objective Primal Inf. Dual Inf. Time
304   0 handle free variables 9s
305 5676 6.1136560e+03 5.545762e+02 0.000000e+00 10s
306 7498 5.9970500e+03 0.000000e+00 0.000000e+00 10s
307 7498 5.9970500e+03 0.000000e+00 0.000000e+00 10s
308
309 Root relaxation: objective 5.997050e+03, 7498 iterations, 1.32 seconds (2.26 work units)
310
311   Nodes | Current Node | Objective Bounds | Work
312 Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
313
314 0 0 5997.05002 0 97 - 5997.05002 - - 11s
315 0 0 5997.05002 0 381 - 5997.05002 - - 13s
316 0 0 5997.05002 0 313 - 5997.05002 - - 13s
317 0 0 5997.05002 0 183 - 5997.05002 - - 13s
318 0 0 5997.05002 0 225 - 5997.05002 - - 14s
319 0 0 5997.05002 0 198 - 5997.05002 - - 16s
320 0 0 5997.05002 0 207 - 5997.05002 - - 16s
321 0 0 5997.05002 0 351 - 5997.05002 - - 18s
322 0 0 5997.05002 0 331 - 5997.05002 - - 19s
323 0 0 5997.05002 0 54 - 5997.05002 - - 21s
324 0 0 5997.05002 0 186 - 5997.05002 - - 21s
325 0 0 5997.05002 0 57 - 5997.05002 - - 23s
326 0 0 5997.05002 0 54 - 5997.05002 - - 23s
327 H 0 0 10117.050019 5997.05002 40.7% - 23s
328 0 0 5997.05002 0 50 10117.0500 5997.05002 40.7% - 24s
329 H 0 0 8157.0500186 5997.05002 26.5% - 24s
330 H 0 0 5997.0500186 5997.05002 0.00% - 26s
331 0 0 5997.05002 0 50 5997.05002 5997.05002 0.00% - 26s

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332
333 Cutting planes:
334   Learned: 13
335   Gomory: 1
336   Cover: 170
337   Implied bound: 509
338   Clique: 1693
339   MIR: 108
340   StrongCG: 65
341   GUB cover: 61
342   RLT: 16
343   Relax-and-lift: 35
344   BQP: 6
345   PSD: 1
346
347 Explored 1 nodes (58296 simplex iterations) in 26.18 seconds (35.94 work units)
348 Thread count was 8 (of 8 available processors)
349
350 Solution count 3: 5997.05 8157.05 10117.1
351
352 Optimal solution found (tolerance 1.00e-10)
353 Best objective 5.997050018628e+03, best bound 5.997050018628e+03, gap 0.0000%
354 Set parameter MIPGap to value 1e-08
355 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
356
357 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
358 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
359
360 Optimize a model with 536248 rows, 14427 columns and 1098671 nonzeros
361 Model fingerprint: 0x429b8f2b
362 Variable types: 36 continuous, 14391 integer (8316 binary)
363 Coefficient statistics:
364   Matrix range    [1e-01, 1e+10]
365   Objective range [6e-05, 5e+01]
366   Bounds range   [1e+00, 1e+00]
367   RHS range      [8e-01, 1e+10]
368 Warning: Model contains large matrix coefficients
369 Warning: Model contains large rhs
370   Consider reformulating model or setting NumericFocus parameter
371   to avoid numerical issues.
372 Presolve removed 531230 rows and 12806 columns
373 Presolve time: 0.38s
374 Presolved: 5018 rows, 1621 columns, 13278 nonzeros
375 Variable types: 8 continuous, 1613 integer (931 binary)
376
377 Root relaxation: objective 5.079193e+03, 1378 iterations, 0.02 seconds (0.02 work units)
378
379   Nodes | Current Node | Objective Bounds | Work
380 Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
381
382 H  0  0          5079.1928758 14424.7410 184% - 0s
383   0  0    - 0    5079.19288 5079.19288 0.00% - 0s
384
385 Explored 1 nodes (1872 simplex iterations) in 0.54 seconds (0.81 work units)
386 Thread count was 8 (of 8 available processors)
387
388 Solution count 1: 5079.19
389
390 Optimal solution found (tolerance 1.00e-08)
391 Best objective 5.079192875771e+03, best bound 5.079192875771e+03, gap 0.0000%
392 SP is solved
393 SP's optimal solution is'□5079
394
395 Itr = 2
396 Collect_LB = [846.0, 5531.050018627815, 5997.050018627813]
397 Collect_UB = [10216.10003725563, 5979.19287577067, 5943.050018627813]
398 Collect_Hua = [0.0, 4685.050018627815, 5133.19287577067]
399 Collect_SPObjVal = [4685.050018627815, 5133.19287577067, 5079.19287577067]
400 Collect_MPObjValNHua = [846.0, 846.0, 863.8571428571431]
401
402
403 Ops, stop iteration
404 Values adopted from the Itr' th iteration, and Itr = {2}, judgeCount = {2}
405
406 ~~~~~judge = 2, SPObj_SPF = 5079.19287577067
407 Vessel i: 0:   pi: 0-7,   ai-di: 6-22,   gi_SP-gpi_SP: 0.000000-0.000000,   ai_SP-di: 6-22,   taoi-deltai: 6-21,   taoPi_SP-deltaPi_SP: 6-21,   betaNi: 15
408   ,   bi: 15
409 Vessel i: 1:   pi: 0-7,   ai-di: 48-75,   gi_SP-gpi_SP: 0.000000-0.000000,   ai_SP-di: 48-75,   taoi-deltai: 48-74,   taoPi_SP-deltaPi_SP: 48-68,   betaNi:
410   26,   bi: 26
411 Vessel i: 2:   pi: 14-21,   ai-di: 25-52,   gi_SP-gpi_SP: 0.000000-0.000000,   ai_SP-di: 25-52,   taoi-deltai: 25-51,   taoPi_SP-deltaPi_SP: 25-51,
412   betaNi: 26,   bi: 26
413 Vessel i: 3:   pi: 14-19,   ai-di: 14-21,   gi_SP-gpi_SP: 0.000000-0.000000,   ai_SP-di: 14-21,   taoi-deltai: 14-20,   taoPi_SP-deltaPi_SP: 14-20,
414   betaNi: 6,   bi: 6
415 Vessel i: 4:   pi: 7-14,   ai-di: 6-30,   gi_SP-gpi_SP: 0.000000-0.000000,   ai_SP-di: 6-30,   taoi-deltai: 6-29,   taoPi_SP-deltaPi_SP: 6-29,   betaNi: 23

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411 , bi: 23
412 Vessel i: 5: pi: 7-14, ai-di: 37-62, gi_SP-gpi_SP: 0.371429-0.400000, ai_SP-di: 38-62, taoi-deltai: 42-55, taoPi_SP-deltaPi_SP: 42-55, betaNi
: 13, bi: 13
413 Vessel i: 6: pi: 20-25, ai-di: 2-21, gi_SP-gpi_SP: 1.000000-0.000000, ai_SP-di: 10-21, taoi-deltai: 8-14, taoPi_SP-deltaPi_SP: 10-14, betaNi:
6, bi: 6
414 Vessel i: 7: pi: 28-34, ai-di: 7-27, gi_SP-gpi_SP: 0.600000-1.000000, ai_SP-di: 13-27, taoi-deltai: 11-16, taoPi_SP-deltaPi_SP: 13-16, betaNi
: 5, bi: 5
415 Vessel i: 8: pi: 14-21, ai-di: 51-71, gi_SP-gpi_SP: 0.428571-1.000000, ai_SP-di: 54-71, taoi-deltai: 54-59, taoPi_SP-deltaPi_SP: 54-59,
betaNi: 5, bi: 5
416
417 round LB = [846, 5531, 5997]
418 round UB = [10216, 5979, 5943]
419 round Hua = [0, 4685, 5133]
420 round SPObjVal = [4685, 5133, 5079]
421 round MPObjValNHua = [846, 846, 864]
422
423 OptimalObj = 5997.050018627813
424 Time: 148.000000
425
426
427
428