



```

80 H 27 38 4101.0000000 1621.00000 60.5% 2238 51s
81 H 35 38 3541.0000000 1621.00000 54.2% 2371 51s
82 37 52 1621.00000 7 299 3541.00000 1621.00000 54.2% 2373 55s
83 53 107 1621.00000 9 177 3541.00000 1621.00000 54.2% 2091 65s
84 H 119 107 3421.0000000 1621.00000 52.6% 1439 65s
85 127 200 1621.00000 34 322 3421.00000 1621.00000 52.6% 1396 81s
86 253 353 1901.00000 71 181 3421.00000 1621.00000 52.6% 1024 102s
87 428 549 1901.00000 104 321 3421.00000 1621.00000 52.6% 820 135s
88 H 616 543 2301.0000000 1621.00000 29.6% 796 135s
89 H 662 463 1941.0000000 1621.00000 16.5% 822 135s
90 * 683 424 183 1901.0000000 1621.00000 14.7% 810 135s
91 691 524 cutoff 156 1901.00000 1621.00000 14.7% 808 167s
92 * 924 494 302 1861.0000000 1621.00000 12.9% 708 167s
93 1188 661 1701.00000 37 402 1861.00000 1621.00000 12.9% 619 193s
94 H 1421 644 1821.0000000 1621.00000 11.0% 556 193s
95 H 1667 13 1621.0000000 1621.00000 0.00% 505 194s
96
97 Cutting planes:
98 Gomory: 8
99 Cover: 204
100 Implied bound: 786
101 Clique: 21
102 MIR: 125
103 StrongCG: 69
104 GUB cover: 23
105 Zero half: 12
106 RLT: 85
107 Relax-and-lift: 15
108 BQP: 63
109
110 Explored 1667 nodes (903536 simplex iterations) in 221.48 seconds (539.15 work units)
111 Thread count was 8 (of 8 available processors)
112
113 Solution count 10: 1621 1821 1861 ... 4221
114
115 Optimal solution found (tolerance 1.00e-10)
116 Best objective 1.6210000000000e+03, best bound 1.6210000000000e+03, gap 0.0000%
117 Set parameter MIPGap to value 1e-08
118 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
119
120 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
121 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
122
123 Optimize a model with 5031518 rows, 3985663 columns and 35472712 nonzeros
124 Model fingerprint: 0x2517293c
125 Variable types: 1972071 continuous, 2013592 integer (2004817 binary)
126 Coefficient statistics:
127 Matrix range [1e-01, 1e+10]
128 Objective range [6e-05, 5e+01]
129 Bounds range [1e+00, 8e+01]
130 RHS range [8e-01, 1e+10]
131 Warning: Model contains large matrix coefficients
132 Warning: Model contains large rhs
133 Consider reformulating model or setting NumericFocus parameter
134 to avoid numerical issues.
135 Presolve removed 5016833 rows and 3982807 columns (presolve time = 5s) ...
136 Presolve removed 5025638 rows and 3983681 columns (presolve time = 10s) ...
137 Presolve removed 5025650 rows and 3983681 columns
138 Presolve time: 10.63s
139 Presolved: 5868 rows, 1982 columns, 15677 nonzeros
140 Variable types: 11 continuous, 1971 integer (1146 binary)
141 Found heuristic solution: objective 6051.1523856
142
143 Root simplex log...
144
145 Iteration Objective Primal Inf. Dual Inf. Time
146 0 1.3145847e+04 1.048784e+04 0.000000e+00 14s
147 1842 7.9439468e+03 0.000000e+00 0.000000e+00 14s
148
149 Root relaxation: objective 7.943947e+03, 1842 iterations, 0.03 seconds (0.02 work units)
150
151 Nodes | Current Node | Objective Bounds | Work
152 Expl Unexpl | Obj Depth IntInf | Incumbent BestBd Gap | It/Node Time
153
154 0 0 7943.94683 0 169 6051.15239 7943.94683 31.3% - 13s
155 H 0 0 7190.4857190 7943.94683 10.5% - 13s
156 H 0 0 7724.9539729 7943.94683 2.83% - 13s
157 H 0 0 7816.9539729 7943.94683 1.62% - 13s
158 0 0 7908.19683 0 16 7816.95397 7908.19683 1.17% - 13s
159 H 0 0 7861.9539729 7908.19683 0.59% - 13s
160 H 0 0 7867.1523856 7907.95397 0.52% - 13s
161 H 0 0 7890.9301634 7907.95397 0.22% - 13s
162 * 0 0 0 7907.9539729 7907.95397 0.00% - 13s
163

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164 Cutting planes:
165   Learned: 53
166   Gomory: 13
167   Cover: 49
168   Implied bound: 48
169   Clique: 50
170   MIR: 11
171   Flow cover: 11
172   Zero half: 3
173   RLT: 28
174   Relax-and-lift: 38
175   BQP: 5
176   PSD: 11
177
178 Explored 1 nodes (3799 simplex iterations) in 14.44 seconds (15.81 work units)
179 Thread count was 8 (of 8 available processors)
180
181 Solution count 8: 7907.95 7890.93 7867.15 ... 6051.15
182
183 Optimal solution found (tolerance 1.00e-08)
184 Best objective 7.907953972926e+03, best bound 7.907953972926e+03, gap 0.0000%
185 SP is solved
186 SP's optimal solution is '[7907
187
188   Itr = 0
189   Collect_LB = [1621.0]
190   Collect_UB = [17436.907945851948]
191   Collect_Hua = [0.0]
192   Collect_SPObjVal = [7907.953972925974]
193   Collect_MPObjValNHua = [1621.0]
194
195
196 Time: 515.000000
197
198
199
200
201
202 Set parameter TimeLimit to value 10800
203 Set parameter MIPGap to value 0.05
204 Gurobi Optimizer version 10.0.2 build v10.0.2rc0 (win64)
205
206 CPU model: 11th Gen Intel(R) Core(TM) i7-11370H @ 3.30GHz, instruction set [SSE2|AVX|AVX2|AVX512]
207 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
208
209 Optimize a model with 1835662 rows, 588381 columns and 5506130 nonzeros
210 Model fingerprint: 0xe90a82eb
211 Variable types: 1 continuous, 588380 integer (571909 binary)
212 Coefficient statistics:
213   Matrix range    [1e-01, 1e+10]
214   Objective range [1e+00, 2e+01]
215   Bounds range    [1e+00, 1e+00]
216   RHS range       [1e+00, 2e+10]
217 Warning: Model contains large matrix coefficients
218 Warning: Model contains large rhs
219   Consider reformulating model or setting NumericFocus parameter
220   to avoid numerical issues.
221 Presolve removed 1582979 rows and 556700 columns (presolve time = 5s) ...
222 Presolve removed 1645964 rows and 562145 columns (presolve time = 10s) ...
223 Presolve removed 1653437 rows and 569708 columns (presolve time = 18s) ...
224 Presolve removed 1722547 rows and 571006 columns (presolve time = 20s) ...
225 Presolve removed 1724257 rows and 571089 columns
226 Presolve time: 20.89s
227 Presolved: 111405 rows, 17292 columns, 352727 nonzeros
228 Variable types: 1 continuous, 17291 integer (14501 binary)
229
230 Deterministic concurrent LP optimizer: primal and dual simplex (primal and dual model)
231 Showing first log only...
232
233 Root relaxation presolved: 17292 rows, 128697 columns, 370019 nonzeros
234
235
236 Root simplex log...
237
238 Iteration   Objective    Primal Inf.   Dual Inf.    Time
239     0   9.9730968e+03  0.000000e+00  7.047841e+04  22s
240  21906  9.9900681e+03  0.000000e+00  7.884843e+03  25s
241  22300  9.9730968e+03  0.000000e+00  0.000000e+00  25s
242  22300  9.9730968e+03  0.000000e+00  0.000000e+00  25s
243 Concurrent spin time: 1.10s
244
245 Solved with primal simplex
246
247 Root relaxation: objective 9.973097e+03, 22300 iterations, 4.62 seconds (6.23 work units)

```

|     |                             |        |              |       |                  |             |        |      |         |      |
|-----|-----------------------------|--------|--------------|-------|------------------|-------------|--------|------|---------|------|
| 248 | Total elapsed time = 30.07s |        |              |       |                  |             |        |      |         |      |
| 249 |                             |        |              |       |                  |             |        |      |         |      |
| 250 | Nodes                       |        | Current Node |       | Objective Bounds |             | Work   |      |         |      |
| 251 | Expl                        | Unexpl | Obj          | Depth | IntInf           | Incumbent   | BestBd | Gap  | It/Node | Time |
| 252 |                             |        |              |       |                  |             |        |      |         |      |
| 253 | 0                           | 0      | 9973.09683   | 0     | 903              | -9973.09683 | -      | -    | 31s     |      |
| 254 | 0                           | 0      | 9973.09683   | 0     | 903              | -9973.09683 | -      | -    | 31s     |      |
| 255 | 0                           | 0      | 9973.09683   | 0     | 879              | -9973.09683 | -      | -    | 31s     |      |
| 256 | 0                           | 0      | 9973.09683   | 0     | 1405             | -9973.09683 | -      | -    | 40s     |      |
| 257 | 0                           | 0      | 9973.09683   | 0     | 1460             | -9973.09683 | -      | -    | 44s     |      |
| 258 | 0                           | 0      | 9973.09683   | 0     | 1453             | -9973.09683 | -      | -    | 44s     |      |
| 259 | 0                           | 0      | 9973.09683   | 0     | 1622             | -9973.09683 | -      | -    | 49s     |      |
| 260 | 0                           | 0      | 9973.09683   | 0     | 1531             | -9973.09683 | -      | -    | 51s     |      |
| 261 | 0                           | 0      | 9973.09683   | 0     | 844              | -9973.09683 | -      | -    | 71s     |      |
| 262 | 0                           | 0      | 9973.09683   | 0     | 768              | -9973.09683 | -      | -    | 71s     |      |
| 263 | 0                           | 0      | 9973.09683   | 0     | 1266             | -9973.09683 | -      | -    | 75s     |      |
| 264 | 0                           | 0      | 9973.09683   | 0     | 1222             | -9973.09683 | -      | -    | 75s     |      |
| 265 | 0                           | 0      | 9973.09683   | 0     | 1014             | -9973.09683 | -      | -    | 92s     |      |
| 266 | 0                           | 0      | 9973.09683   | 0     | 1000             | -9973.09683 | -      | -    | 92s     |      |
| 267 | 0                           | 0      | 9973.09683   | 0     | 960              | -9973.09683 | -      | -    | 94s     |      |
| 268 | 0                           | 0      | 9973.09683   | 0     | 1188             | -9973.09683 | -      | -    | 930s    |      |
| 269 | 0                           | 0      | 9973.09683   | 0     | 1132             | -9973.09683 | -      | -    | 930s    |      |
| 270 | 0                           | 0      | 9973.09683   | 0     | 1223             | -9973.09683 | -      | -    | 933s    |      |
| 271 | 0                           | 0      | 9973.09683   | 0     | 1282             | -9973.09683 | -      | -    | 954s    |      |
| 272 | 0                           | 0      | 9973.09683   | 0     | 1500             | -9973.09683 | -      | -    | 958s    |      |
| 273 | 0                           | 0      | 9973.09683   | 0     | 1498             | -9973.09683 | -      | -    | 958s    |      |
| 274 | 0                           | 0      | 9973.09683   | 0     | 1644             | -9973.09683 | -      | -    | 961s    |      |
| 275 | 0                           | 0      | 9973.09683   | 0     | 1185             | -9973.09683 | -      | -    | 984s    |      |
| 276 | 0                           | 0      | 9973.09683   | 0     | 1185             | -9973.09683 | -      | -    | 989s    |      |
| 277 | 0                           | 2      | 9973.09683   | 0     | 1185             | -9973.09683 | -      | -    | 1010s   |      |
| 278 | 3                           | 8      | 9973.09683   | 2     | 1409             | -9973.09683 | -      | 8140 | 1024s   |      |
| 279 | 7                           | 12     | 9973.09683   | 3     | 1804             | -9973.09683 | -      | 6319 | 1036s   |      |
| 280 | 11                          | 16     | 9973.09683   | 3     | 1711             | -9973.09683 | -      | 8221 | 1043s   |      |
| 281 | 15                          | 20     | 9973.09683   | 4     | 1666             | -9973.09683 | -      | 8711 | 1051s   |      |
| 282 | 19                          | 24     | 9974.61766   | 5     | 2058             | -9973.09683 | -      | 7769 | 1061s   |      |
| 283 | 23                          | 29     | 9973.09683   | 5     | 2006             | -9973.09683 | -      | 8744 | 1070s   |      |
| 284 | 28                          | 34     | 9973.09683   | 6     | 1788             | -9973.09683 | -      | 7924 | 1076s   |      |
| 285 | 33                          | 40     | 9973.09683   | 7     | 1623             | -9973.09683 | -      | 7588 | 1081s   |      |
| 286 | 39                          | 51     | infeasible   | 8     |                  | -9973.09683 | -      | 6960 | 1092s   |      |
| 287 | 57                          | 60     | 9973.09683   | 10    | 1983             | -9973.09683 | -      | 7165 | 1110s   |      |
| 288 | 77                          | 76     | 9973.09683   | 11    | 1769             | -9973.09683 | -      | 6053 | 1119s   |      |
| 289 | 99                          | 97     | 9977.21374   | 13    | 2268             | -9973.09683 | -      | 5448 | 1130s   |      |
| 290 | 149                         | 114    | 10053.0968   | 23    | 2033             | -9973.09683 | -      | 4336 | 1138s   |      |
| 291 | 197                         | 133    | 10533.0968   | 29    | 1526             | -9973.09683 | -      | 3842 | 1148s   |      |
| 292 | 243                         | 153    | 9973.76241   | 5     | 1855             | -9973.09683 | -      | 3559 | 1158s   |      |
| 293 | 290                         | 172    | 9990.03826   | 10    | 2815             | -9973.09683 | -      | 3330 | 1167s   |      |
| 294 | 314                         | 196    | 10053.0968   | 9     | 1313             | -9973.09683 | -      | 3191 | 1172s   |      |
| 295 | 350                         | 237    | 10053.0968   | 11    | 1724             | -9973.09683 | -      | 2997 | 1180s   |      |
| 296 | 400                         | 285    | 10053.0968   | 10    | 1311             | -9973.09683 | -      | 2775 | 1187s   |      |
| 297 | 454                         | 352    | 10053.0968   | 16    | 1270             | -9973.09683 | -      | 2595 | 1194s   |      |
| 298 | 527                         | 436    | 10053.0968   | 34    | 1139             | -9973.09683 | -      | 2328 | 1202s   |      |
| 299 | 626                         | 489    | 10053.0968   | 71    | 1065             | -9973.09683 | -      | 2098 | 1209s   |      |
| 300 | 699                         | 513    | 10173.0968   | 82    | 1301             | -9973.09683 | -      | 1990 | 1219s   |      |
| 301 | 746                         | 530    | 10173.0968   | 107   | 1169             | -9973.09683 | -      | 1968 | 1226s   |      |
| 302 | 763                         | 546    | 10173.0968   | 110   | 1229             | -9973.09683 | -      | 1983 | 1235s   |      |
| 303 | 779                         | 587    | 10213.0968   | 115   | 1658             | -9973.09683 | -      | 2041 | 1244s   |      |
| 304 | 832                         | 622    | 10173.0968   | 140   | 1151             | -9973.09683 | -      | 2008 | 1256s   |      |
| 305 | 917                         | 689    | 11430.5510   | 12    | 1938             | -9973.09683 | -      | 1919 | 1267s   |      |
| 306 | 993                         | 703    | infeasible   | 52    |                  | -9973.09683 | -      | 1865 | 1280s   |      |
| 307 | 1022                        | 704    | 10333.0968   | 78    | 1185             | -9973.09683 | -      | 1908 | 1350s   |      |
| 308 | 1024                        | 705    | 10053.0968   | 12    | 1021             | -9973.09683 | -      | 1905 | 1384s   |      |
| 309 | 1025                        | 706    | 10053.0968   | 15    | 1736             | -9973.42667 | -      | 1903 | 1431s   |      |
| 310 | 1026                        | 707    | 10413.0968   | 24    | 2748             | -9974.51132 | -      | 1901 | 1450s   |      |
| 311 | 1029                        | 709    | 10533.0968   | 173   | 2877             | -9974.52953 | -      | 1895 | 1464s   |      |
| 312 | 1030                        | 709    | 10213.0968   | 45    | 1443             | -10012.2796 | -      | 1893 | 1570s   |      |
| 313 | 1031                        | 710    | 10213.0968   | 116   | 1770             | -10012.2796 | -      | 1892 | 1626s   |      |
| 314 | 1032                        | 711    | 10173.0968   | 19    | 2020             | -10013.0968 | -      | 1890 | 1748s   |      |
| 315 | 1033                        | 711    | 10533.0968   | 147   | 2772             | -10013.0968 | -      | 1888 | 1835s   |      |
| 316 | 1034                        | 712    | 10093.0968   | 70    | 2913             | -10013.0968 | -      | 1886 | 1931s   |      |
| 317 | 1035                        | 713    | 10013.0968   | 13    | 3035             | -10013.0968 | -      | 1884 | 1963s   |      |
| 318 | 1036                        | 713    | 10293.0968   | 63    | 1710             | -10013.0968 | -      | 1882 | 2124s   |      |
| 319 | 1037                        | 714    | 10813.0968   | 122   | 2861             | -10013.0968 | -      | 1881 | 2264s   |      |
| 320 | 1038                        | 715    | 11613.0968   | 35    | 1983             | -10013.0968 | -      | 1879 | 2423s   |      |
| 321 | 1039                        | 715    | 10208.8863   | 115   | 2802             | -10013.0968 | -      | 1877 | 2563s   |      |
| 322 | 1040                        | 716    | 10773.0968   | 119   | 2999             | -10013.0968 | -      | 1875 | 2659s   |      |
| 323 | 1041                        | 717    | 10053.0968   | 14    | 3020             | -10013.0968 | -      | 1873 | 2710s   |      |
| 324 | 1042                        | 717    | 10493.0968   | 208   | 3144             | -10013.0968 | -      | 1872 | 2812s   |      |
| 325 | 1043                        | 718    | 10013.0968   | 7     | 3372             | -10013.0968 | -      | 1870 | 2899s   |      |
| 326 | 1044                        | 719    | 10653.0968   | 100   | 3544             | -10013.0968 | -      | 1868 | 3078s   |      |
| 327 | 1045                        | 719    | 10213.0968   | 115   | 3431             | -10013.0968 | -      | 1866 | 3162s   |      |
| 328 | 1046                        | 720    | 10545.0968   | 207   | 3371             | -10013.0968 | -      | 1864 | 3255s   |      |
| 329 | 1049                        | 723    | 10493.0968   | 80    | 1185             | -10013.0968 | -      | 2648 | 3262s   |      |
| 330 | 1051                        | 724    | 10013.0968   | 6     | 1177             | -10013.0968 | -      | 2643 | 3296s   |      |
| 331 | 1052                        | 725    | 10013.0968   | 11    | 1533             | -10013.0968 | -      | 2640 | 3431s   |      |

unknown

|     |                             |      |            |     |      |              |               |
|-----|-----------------------------|------|------------|-----|------|--------------|---------------|
| 332 | 1053                        | 726  | 10545.0968 | 204 | 2517 | - 10013.0968 | - 2638 3513s  |
| 333 | 1054                        | 726  | 10493.0968 | 213 | 1767 | - 10013.0968 | - 2635 3585s  |
| 334 | 1055                        | 727  | 10213.0968 | 132 | 2735 | - 10013.0968 | - 2633 3649s  |
| 335 | 1056                        | 728  | 10493.0968 | 85  | 3151 | - 10013.0968 | - 2630 3725s  |
| 336 | 1057                        | 728  | 10014.2944 | 7   | 3262 | - 10013.0968 | - 2628 3778s  |
| 337 | 1058                        | 729  | 10493.0968 | 82  | 3111 | - 10013.0968 | - 2625 3845s  |
| 338 | 1059                        | 730  | 10194.1495 | 143 | 3048 | - 10013.0968 | - 2623 3877s  |
| 339 | 1060                        | 730  | 10693.0968 | 14  | 1646 | - 10013.0968 | - 2620 4006s  |
| 340 | 1061                        | 731  | 10893.0968 | 137 | 2327 | - 10013.0968 | - 2618 4092s  |
| 341 | 1062                        | 732  | 10493.0968 | 56  | 2957 | - 10013.0968 | - 2615 4213s  |
| 342 | 1063                        | 732  | 10208.8863 | 115 | 2877 | - 10013.0968 | - 2613 4257s  |
| 343 | 1064                        | 733  | 10013.0968 | 9   | 3115 | - 10013.0968 | - 2610 4379s  |
| 344 | 1065                        | 734  | 10013.0968 | 7   | 3003 | - 10013.0968 | - 2608 4436s  |
| 345 | 1066                        | 734  | 10853.0968 | 129 | 3267 | - 10013.0968 | - 2606 4560s  |
| 346 | 1067                        | 735  | 10613.0968 | 35  | 3011 | - 10013.0968 | - 2603 4655s  |
| 347 | 1068                        | 736  | 10253.0968 | 6   | 2877 | - 10013.0968 | - 2601 4777s  |
| 348 | 1069                        | 736  | 10733.0968 | 148 | 2417 | - 10013.0968 | - 2598 4814s  |
| 349 | 1070                        | 737  | 10493.0968 | 184 | 2417 | - 10013.0968 | - 2596 4865s  |
| 350 | 1071                        | 741  | 10013.0968 | 22  | 2701 | - 10013.0968 | - 1597 5022s  |
| 351 | 1073                        | 744  | 10013.0968 | 23  | 2476 | - 10013.0968 | - 1632 5059s  |
| 352 | 1077                        | 747  | 10027.3054 | 24  | 2707 | - 10013.0968 | - 1734 5103s  |
| 353 | 1081                        | 749  | 10013.8665 | 24  | 2905 | - 10013.0968 | - 2047 5260s  |
| 354 | 1085                        | 748  | infeasible | 25  |      | - 10013.0968 | - 2239 5302s  |
| 355 | 1089                        | 751  | 10022.0616 | 25  | 2607 | - 10013.0968 | - 2287 5371s  |
| 356 | 1093                        | 748  | infeasible | 25  |      | - 10013.0968 | - 2439 5415s  |
| 357 | 1100                        | 750  | 10053.0968 | 26  | 2602 | - 10013.0968 | - 2550 5510s  |
| 358 | 1104                        | 750  | infeasible | 27  |      | - 10013.0968 | - 2713 5544s  |
| 359 | 1111                        | 751  | 10053.0968 | 28  | 2030 | - 10013.0968 | - 2731 5612s  |
| 360 | 1119                        | 756  | 10235.6819 | 29  | 1762 | - 10013.0968 | - 2850 5653s  |
| 361 | 1128                        | 756  | infeasible | 29  |      | - 10013.0968 | - 2931 5675s  |
| 362 | 1137                        | 751  | infeasible | 30  |      | - 10013.0968 | - 2977 5722s  |
| 363 | 1150                        | 747  | 10023.0583 | 28  | 1883 | - 10013.0968 | - 3076 5790s  |
| 364 | 1162                        | 748  | 10136.9537 | 29  | 1565 | - 10013.0968 | - 3246 5859s  |
| 365 | 1167                        | 751  | 10025.8220 | 30  | 2508 | - 10013.0968 | - 3390 5960s  |
| 366 | 1171                        | 752  | infeasible | 31  |      | - 10013.0968 | - 3610 6005s  |
| 367 | 1178                        | 757  | 10053.0968 | 32  | 2146 | - 10013.0968 | - 3739 6081s  |
| 368 | 1187                        | 759  | 10373.0968 | 33  | 1905 | - 10013.0968 | - 3932 6155s  |
| 369 | 1194                        | 761  | infeasible | 34  |      | - 10013.0968 | - 4065 6213s  |
| 370 | 1204                        | 761  | 10333.0968 | 35  | 1987 | - 10013.0968 | - 4189 6279s  |
| 371 | 1216                        | 767  | 10333.0968 | 37  | 1556 | - 10013.0968 | - 4325 6342s  |
| 372 | 1226                        | 773  | 10380.8767 | 37  | 1931 | - 10013.0968 | - 4446 6395s  |
| 373 | 1245                        | 778  | 10761.3640 | 42  | 1545 | - 10013.0968 | - 4508 6471s  |
| 374 | 1264                        | 775  | 11298.3182 | 45  | 1534 | - 10013.0968 | - 4582 6525s  |
| 375 | 1289                        | 775  | 10016.7800 | 28  | 2449 | - 10013.0968 | - 4621 6715s  |
| 376 | 1299                        | 776  | 10016.7990 | 28  | 2187 | - 10013.0968 | - 4689 6794s  |
| 377 | 1317                        | 780  | 10016.7990 | 29  | 2198 | - 10013.0968 | - 4815 6877s  |
| 378 | 1331                        | 784  | 10053.0968 | 33  | 2364 | - 10013.0968 | - 4956 6948s  |
| 379 | 1350                        | 779  | 10053.0968 | 34  | 2029 | - 10013.0968 | - 5099 7033s  |
| 380 | 1371                        | 785  | 10062.7204 | 37  | 2003 | - 10013.0968 | - 5220 7118s  |
| 381 | 1395                        | 785  | 10743.3096 | 42  | 2176 | - 10013.0968 | - 5364 7216s  |
| 382 | 1409                        | 792  | 10189.9185 | 43  | 2486 | - 10016.3475 | - 5486 7319s  |
| 383 | 1443                        | 802  | 10047.0746 | 33  | 2458 | - 10016.9084 | - 5574 7410s  |
| 384 | 1471                        | 817  | 10381.6688 | 37  | 2157 | - 10017.5955 | - 5656 7488s  |
| 385 | 1545                        | 811  | infeasible | 34  |      | - 10017.6751 | - 5588 7553s  |
| 386 | 1583                        | 803  | 10359.1366 | 33  | 1965 | - 10019.6451 | - 5590 7644s  |
| 387 | 1616                        | 798  | 10053.0968 | 33  | 1950 | - 10023.0583 | - 5668 7743s  |
| 388 | 1651                        | 799  | 10053.0968 | 36  | 1977 | - 10023.0583 | - 5739 7825s  |
| 389 | 1672                        | 814  | 10096.3906 | 37  | 2121 | - 10023.0583 | - 5875 7975s  |
| 390 | 1733                        | 806  | 10121.3773 | 38  | 3064 | - 10027.5145 | - 5853 8103s  |
| 391 | 1775                        | 809  | 10204.2468 | 33  | 2056 | - 10027.5145 | - 5947 8233s  |
| 392 | 1818                        | 825  | 11398.9998 | 35  | 1353 | - 10027.5145 | - 6020 8346s  |
| 393 | 1862                        | 874  | 10915.4708 | 45  | 1598 | - 10027.5145 | - 6091 8455s  |
| 394 | 1969                        | 898  | 11544.3789 | 65  | 794  | - 10027.5145 | - 5937 8741s  |
| 395 | 2037                        | 963  | 11533.0968 | 75  | 641  | - 10053.0968 | - 5793 8846s  |
| 396 | 2141                        | 982  | infeasible | 34  |      | - 10053.0968 | - 5666 8948s  |
| 397 | 2245                        | 966  | infeasible | 36  |      | - 10053.0968 | - 5547 9117s  |
| 398 | 2312                        | 962  | 11682.8578 | 39  | 2034 | - 10053.0968 | - 5645 9246s  |
| 399 | 2362                        | 967  | infeasible | 33  |      | - 10053.0968 | - 5706 9412s  |
| 400 | 2437                        | 936  | infeasible | 32  |      | - 10057.9773 | - 5740 9548s  |
| 401 | 2519                        | 950  | 10688.2079 | 42  | 1569 | - 10076.0172 | - 5769 9698s  |
| 402 | 2655                        | 976  | 10407.1267 | 36  | 1864 | - 10133.0968 | - 5687 9872s  |
| 403 | 2813                        | 1000 | infeasible | 37  |      | - 10173.0968 | - 5550 10041s |
| 404 | 3011                        | 1099 | infeasible | 34  |      | - 10190.1319 | - 5364 10182s |
| 405 | 3253                        | 1112 | 11573.0968 | 119 | 604  | - 10220.2763 | - 5108 10333s |
| 406 | 3411                        | 1119 | 10377.0481 | 32  | 2025 | - 10220.2763 | - 5014 10487s |
| 407 | 3478                        | 1155 | infeasible | 42  |      | - 10286.1813 | - 5071 10669s |
| 408 | 3603                        | 1185 | 10373.4729 | 34  | 2282 | - 10333.0968 | - 5058 10800s |
| 409 |                             |      |            |     |      |              |               |
| 410 | Cutting planes:             |      |            |     |      |              |               |
| 411 | Gomory: 6                   |      |            |     |      |              |               |
| 412 | Cover: 633                  |      |            |     |      |              |               |
| 413 | Implied bound: 246          |      |            |     |      |              |               |
| 414 | Projected implied bound: 10 |      |            |     |      |              |               |
| 415 | Clique: 285                 |      |            |     |      |              |               |

unknown

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416 MIR: 113
417 StrongCG: 35
418 Flow cover: 473
419 GUB cover: 96
420 Zero half: 436
421 RLT: 181
422 Relax-and-lift: 1318
423 BQP: 42
424 PSD: 1
425
426 Explored 3656 nodes (20992082 simplex iterations) in 10800.11 seconds (21753.96 work units)
427 Thread count was 8 (of 8 available processors)
428
429 Solution count 0
430
431 Time limit reached
432 Best objective -, best bound 1.033309682907e+04, gap -
433 Traceback (most recent call last):
434   File "<input>", line 1, in <module>
435   File "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\_pydev_bundle\pydev_umd.py", line 198, in runfile
436     pydev_imports.execfile(filename, global_vars, local_vars) # execute the script
437   File "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\_pydev_imps\_pydev_execfile.py", line 18, in execfile
438     exec(compile(contents+"\n", file, 'exec'), glob, loc)
439   File "E:/1 □□□□/3 □□□□□/1 □□□□□□□□/1 □□□□□□□□□□/1_LW_□□□□□/4 □□□□□/3 python_code/9 Code for this paper/
main_RO_CCG.py", line 1366, in <module>
440     HuaValG = Hua.x
441   File "src\gurobipy\var.pxi", line 125, in gurobipy.Var.__getattr__
442   File "src\gurobipy\var.pxi", line 153, in gurobipy.Var.getAttr
443   File "src\gurobipy\attrutil.pxi", line 100, in gurobipy.__getattr__
444   AttributeError: Unable to retrieve attribute 'x'
445
```