

```

1 /Library/Frameworks/Python.framework/Versions/2.7/bin/
  python2.7 /Users/jianili/Documents/github/Advanced_AI/
  Homework2_HexGame/main.py
2 player1 move = [4, 3]
3 time used for this move:0.013224
4 ■■■■■■
5 □ . . . . □
6 □ . . . . □
7   □ . . . . □
8     □ . . . . □
9       □ . . . . □
10         □ . . . . □
11           □ . . . . □
12             □ . . . . □
13               ■■■■■■
14
15 -1's turn to place a ○ piece
16 player2 move = (3, 4)
17 time used for this move:0.043622
18 ■■■■■■
19 □ . . . . □
20 □ . . . . □
21   □ . . . . □
22     □ . . . . □
23       □ . . . . □
24         □ . . . . □
25           □ . . . . □
26             □ . . . . □
27               ■■■■■■
28
29 1's turn to place a ● piece
30 the number of simulations performed: 3132
31 the max size of the search tree for all moves 3132
32 Best Child Value: 28
33 Best Child Visits: 130
34 player1 move = (5, 3)
35 time used for this move:60.032356
36 ■■■■■■
37 □ . . . . □
38 □ . . . . □
39   □ . . . . □
40     □ . . . . □
41       □ . . . . □
42         □ . . . . □
43           □ . . . . □
44             □ . . . . □
45               ■■■■■■
46
47 -1's turn to place a ○ piece
48 player2 move = (3, 3)

```

```

49 time used for this move:0.132666
50 ■■■■■■
51 □ . . . . . □
52 □ . . . . . □
53 □ . . . . . □
54 □ . . . ○ ○ . . . □
55 □ . . . ● . . . . □
56 □ . . . ● . . . . □
57 □ . . . . . . . . □
58 □ . . . . . . . . □
59 ■■■■■■
60
61 1's turn to place a ● piece
62 the number of simulations performed: 3062
63 2017-03-06 20:02:39.407 Python[21053:2062160] IMKClient
  Stall detected, *please Report* your user scenario
  attaching a spindump (or sysdiagnose) that captures the
  problem - (imkxpc_attributesForCharacterIndex:reply:) block
  performed very slowly (59.72 secs).
64 the max size of the search tree for all moves 3062
65 Best Child Value: 5
66 Best Child Visits: 107
67 2017-03-06 20:02:39.408 Python[21053:2062160] IMKClient
  Stall detected, *please Report* your user scenario
  attaching a spindump (or sysdiagnose) that captures the
  problem - (imkxpc_windowLevelWithReply:) block performed
  very slowly (57.72 secs).
68 player1 move = (5, 2)
69 time used for this move:60.024857
70 ■■■■■■
71 □ . . . . . □
72 □ . . . . . □
73 □ . . . . . □
74 □ . . . ○ ○ . . . □
75 □ . . . ● . . . . □
76 □ . . . ● ● . . . . □
77 □ . . . . . . . . □
78 □ . . . . . . . . □
79 ■■■■■■
80
81 -1's turn to place a ○ piece
82 player2 move = (3, 5)
83 time used for this move:0.080415
84 ■■■■■■
85 □ . . . . . □
86 □ . . . . . □
87 □ . . . . . □
88 □ . . . ○ ○ ○ . . . □
89 □ . . . ● . . . . □
90 □ . . . ● ● . . . . □

```

```

91      □ . . . . . □
92      □ . . . . . □
93      ▣ ■ ■ ■ ■ ■ ■ ■
94
95 1's turn to place a ● piece
96 2017-03-06 20:03:43.598 Python[21053:2062160] IMKClient
  Stall detected, *please Report* your user scenario
  attaching a spindump (or sysdiagnose) that captures the
  problem - (imkxpc_attributesForCharacterIndex:reply:)
  block performed very slowly (59.96 secs).
97 the number of simulations performed: 2977
98 the max size of the search tree for all moves 2977
99 Best Child Value: -7
100 Best Child Visits: 127
101 player1 move = (5, 1)
102 2017-03-06 20:03:43.599 Python[21053:2062160] IMKClient
  Stall detected, *please Report* your user scenario
  attaching a spindump (or sysdiagnose) that captures the
  problem - (imkxpc_windowLevelWithReply:) block performed
  very slowly (57.95 secs).
103 time used for this move:60.039625
104 ■ ■ ■ ■ ■ ■ ■ ▣
105 □ . . . . . □
106 □ . . . . . □
107 □ . . . . . □
108 □ . . . ○ ○ ○ . . □
109 □ . . . ● . . . . □
110 □ . ● ● ● . . . . □
111 □ . . . . . . . □
112 □ . . . . . . . □
113 ▣ ■ ■ ■ ■ ■ ■ ■
114
115 -1's turn to place a ○ piece
116 player2 move = (4, 2)
117 time used for this move:0.133469
118 ■ ■ ■ ■ ■ ■ ■ ▣
119 □ . . . . . □
120 □ . . . . . □
121 □ . . . . . □
122 □ . . . ○ ○ ○ . . □
123 □ . . ○ ● . . . . □
124 □ . ● ● ● . . . . □
125 □ . . . . . . . □
126 □ . . . . . . . □
127 ▣ ■ ■ ■ ■ ■ ■ ■
128
129 1's turn to place a ● piece
130 the number of simulations performed: 3037
131 the max size of the search tree for all moves 3037
132 Best Child Value: -8

```

```

133 Best Child Visits: 146
134 player1 move = (4, 1)
135 time used for this move:60.020607
136 ■■■■■■■■
137 □ . . . . . □
138 □ . . . . . □
139 □ . . . . . □
140 □ . . . ○ ○ ○ . . □
141 □ . ● ○ ● . . . . □
142 □ . ● ● ● . . . . □
143 □ . . . . . □
144 □ . . . . . □
145 ■■■■■■■■
146
147 -1's turn to place a ○ piece
148 2017-03-06 20:04:51.895 Python[21053:2062160] IMKClient
Stall detected, *please Report* your user scenario
attaching a spindump (or sysdiagnose) that captures the
problem - (imkxpc_attributesForCharacterIndex:reply:)
block performed very slowly (59.75 secs).
149 2017-03-06 20:04:51.895 Python[21053:2062160] IMKClient
Stall detected, *please Report* your user scenario
attaching a spindump (or sysdiagnose) that captures the
problem - (imkxpc_windowLevelWithReply:) block performed
very slowly (57.75 secs).
150 player2 move = (3, 1)
151 time used for this move:0.816553
152 ■■■■■■■■
153 □ . . . . . □
154 □ . . . . . □
155 □ . . . . . □
156 □ . ○ . ○ ○ ○ . . □
157 □ . ● ○ ● . . . . □
158 □ . ● ● ● . . . . □
159 □ . . . . . □
160 □ . . . . . □
161 ■■■■■■■■
162
163 1's turn to place a ● piece
164 the number of simulations performed: 3136
165 the max size of the search tree for all moves 3136
166 Best Child Value: 4
167 Best Child Visits: 154
168 player1 move = (2, 3)
169 time used for this move:60.031497
170 ■■■■■■■■
171 □ . . . . . □
172 □ . . . . . □
173 □ . . . ● . . . . □
174 □ . ○ . ○ ○ ○ . . □

```

```

175  □ . ● ○ ● . . . . □
176  □ . ● ● ● . . . . □
177  □ . . . . . . . . □
178  □ . . . . . . . . □
179  ▣ ■ ■ ■ ■ ■ ■ ■ ■
180
181  -1's turn to place a ○ piece
182  player2 move = (3, 2)
183  time used for this move:1.47045
184  ■ ■ ■ ■ ■ ■ ■ ■ ▣
185  □ . . . . . . . . □
186  □ . . . . . . . . □
187  □ . . . ● . . . . □
188  □ . ○ ○ ○ ○ ○ . . □
189  □ . ● ○ ● . . . . □
190  □ . ● ● ● . . . . □
191  □ . . . . . . . . □
192  □ . . . . . . . . □
193  ▣ ■ ■ ■ ■ ■ ■ ■ ■
194
195  1's turn to place a ● piece
196  the number of simulations performed: 2961
197  the max size of the search tree for all moves 2961
198  Best Child Value: -47
199  Best Child Visits: 149
200  player1 move = (4, 0)
201  time used for this move:60.015727
202  ■ ■ ■ ■ ■ ■ ■ ■ ▣
203  □ . . . . . . . . □
204  □ . . . . . . . . □
205  □ . . . ● . . . . □
206  □ . ○ ○ ○ ○ ○ . . □
207  □ ● ● ○ ● . . . . □
208  □ . ● ● ● . . . . □
209  □ . . . . . . . . □
210  □ . . . . . . . . □
211  ▣ ■ ■ ■ ■ ■ ■ ■ ■
212
213  -1's turn to place a ○ piece
214  player2 move = (3, 0)
215  time used for this move:0.591908
216  ■ ■ ■ ■ ■ ■ ■ ■ ▣
217  □ . . . . . . . . □
218  □ . . . . . . . . □
219  □ . . . ● . . . . □
220  □ ○ ○ ○ ○ ○ . . □
221  □ ● ● ○ ● . . . . □
222  □ . ● ● ● . . . . □
223  □ . . . . . . . . □
224  □ . . . . . . . . □

```

```

225      ■ ■ ■ ■ ■ ■ ■ ■ ■
226
227 1's turn to place a ● piece
228 the number of simulations performed: 2879
229 the max size of the search tree for all moves 2879
230 Best Child Value:  -96
231 Best Child Visits:  194
232 player1 move = (3, 6)
233 time used for this move:60.033367
234 ■ ■ ■ ■ ■ ■ ■ ■ ■
235 □ . . . . . □
236 □ . . . . . □
237 □ . . . ● . . . □
238 □ ○ ○ ○ ○ ○ ○ ● . □
239 □ ● ● ○ ● . . . □
240 □ . ● ● ● . . . □
241 □ . . . . . □
242 □ . . . . . □
243      ■ ■ ■ ■ ■ ■ ■ ■ ■
244
245 -1's turn to place a ○ piece
246 player2 move = (4, 5)
247 time used for this move:1.73892
248 ■ ■ ■ ■ ■ ■ ■ ■ ■
249 □ . . . . . □
250 □ . . . . . □
251 □ . . . ● . . . □
252 □ ○ ○ ○ ○ ○ ○ ● . □
253 □ ● ● ○ ● . ○ . □
254 □ . ● ● ● . . . □
255 □ . . . . . □
256 □ . . . . . □
257      ■ ■ ■ ■ ■ ■ ■ ■ ■
258
259 1's turn to place a ● piece
260 the number of simulations performed: 2945
261 the max size of the search tree for all moves 2945
262 Best Child Value:  -82
263 Best Child Visits:  178
264 player1 move = (4, 6)
265 time used for this move:60.029995
266 ■ ■ ■ ■ ■ ■ ■ ■ ■
267 □ . . . . . □
268 □ . . . . . □
269 □ . . . ● . . . □
270 □ ○ ○ ○ ○ ○ ○ ● . □
271 □ ● ● ○ ● . ○ ● . □
272 □ . ● ● ● . . . □
273 □ . . . . . □
274 □ . . . . . □

```

```

275      ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
276
277 -1's turn to place a ○ piece
278 player2 move = (1, 6)
279 time used for this move:1.102806
280      ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
281  □ . . . . . □
282  □ . . . . . ○ . □
283  □ . . . . ● . . . □
284  □ ○ ○ ○ ○ ○ ○ ● . □
285  □ ● ● ○ ● . ○ ● . □
286  □ . ● ● ● . . . □
287  □ . . . . . . . □
288  □ . . . . . . . □
289  ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
290
291 1's turn to place a ● piece
292 the number of simulations performed: 2999
293 the max size of the search tree for all moves 2999
294 Best Child Value: -99
295 Best Child Visits: 239
296 player1 move = (2, 6)
297 time used for this move:60.017204
298      ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
299  □ . . . . . □
300  □ . . . . . ○ . □
301  □ . . . . ● . ● . □
302  □ ○ ○ ○ ○ ○ ○ ● . □
303  □ ● ● ○ ● . ○ ● . □
304  □ . ● ● ● . . . □
305  □ . . . . . . . □
306  □ . . . . . . . □
307  ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
308
309 -1's turn to place a ○ piece
310 player2 move = (2, 5)
311 time used for this move:0.250029
312      ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
313  □ . . . . . □
314  □ . . . . . ○ . □
315  □ . . . . ● . ○ ● . □
316  □ ○ ○ ○ ○ ○ ○ ● . □
317  □ ● ● ○ ● . ○ ● . □
318  □ . ● ● ● . . . □
319  □ . . . . . . . □
320  □ . . . . . . . □
321  ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
322
323 1's turn to place a ● piece
324 the number of simulations performed: 2988

```

325 the max size of the search tree for all moves 2988

326 Best Child Value: -116

327 Best Child Visits: 260

328 player1 move = (0, 7)

329 time used for this move:60.044603

330 ■■■■■■■■

331 □ . . . . . ● □

332 □ . . . . . ○ . □

333 □ . . . ● . ○ ● . □

334 □ ○ ○ ○ ○ ○ ○ ● . □

335 □ ● ● ○ ● . ○ ● . □

336 □ . ● ● ● . . . . □

337 □ . . . . . . . . □

338 □ . . . . . . . . □

339 ▣■■■■■■■

340

341 -1's turn to place a ○ piece

342 player2 move = (1, 7)

343 time used for this move:0.885246

344 ■■■■■■■■

345 □ . . . . . ● □

346 □ . . . . . ○ ○ □

347 □ . . . ● . ○ ● . □

348 □ ○ ○ ○ ○ ○ ○ ● . □

349 □ ● ● ○ ● . ○ ● . □

350 □ . ● ● ● . . . . □

351 □ . . . . . . . . □

352 □ . . . . . . . . □

353 ▣■■■■■■■

354

355 -1's turn to place a ○ piece

356 -1 wins

357