

```

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, 4)
3 time used for this move:0.027401
4 ■■■■■■■■
5 □ . . . . . □
6 □ . . . . . □
7  □ . . . . . □
8  □ . . . . . □
9    □ . . . . . □
10    □ . . . . . □
11    □ . . . . . □
12    □ . . . . . □
13    ■■■■■■■■
14
15 -1's turn to place a ○ piece
16 the number of simulations performed: 2639
17 the max size of the search tree for all moves 2639
18 Best Child Value: 14
19 Best Child Visits: 104
20 player2 move = (0, 6)
21 time used for this move:60.027339
22 ■■■■■■■■
23 □ . . . . . ○ . □
24 □ . . . . . . □
25  □ . . . . . □
26  □ . . . . . □
27    □ . . . . . □
28    □ . . . . . □
29    □ . . . . . □
30    □ . . . . . □
31    ■■■■■■■■
32
33 1's turn to place a ● piece
34 player1 move = (3, 5)
35 time used for this move:0.309701
36 ■■■■■■■■
37 □ . . . . . ○ . □
38 □ . . . . . . □
39  □ . . . . . □
40  □ . . . . . ● . □
41    □ . . . . . ● . □
42    □ . . . . . . □
43    □ . . . . . □
44    □ . . . . . □
45    ■■■■■■■■
46
47 -1's turn to place a ○ piece
48 the number of simulations performed: 2606

```

```

49 2017-03-06 20:40:01.861 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_attributesForCharacterIndex:reply:) block
    performed very slowly (59.82 secs).
50 the max size of the search tree for all moves 2606
51 Best Child Value: 18
52 2017-03-06 20:40:01.862 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_windowLevelWithReply:) block performed
    very slowly (57.82 secs).
53 Best Child Visits: 128
54 player2 move = (4, 1)
55 time used for this move:60.03135
56 ■■■■■■■■■■
57 □ . . . . . ○ . □
58 □ . . . . . □
59 □ . . . . . □
60 □ . . . . . ● . □
61 □ . ○ . . . ● . . □
62 □ . . . . . □
63 □ . . . . . □
64 □ . . . . . □
65 ■■■■■■■■■■
66
67 1's turn to place a ● piece
68 player1 move = (1, 6)
69 time used for this move:0.443999
70 ■■■■■■■■■■
71 □ . . . . . ○ . □
72 □ . . . . . ● . □
73 □ . . . . . □
74 □ . . . . . ● . □
75 □ . ○ . . . ● . . □
76 □ . . . . . □
77 □ . . . . . □
78 □ . . . . . □
79 ■■■■■■■■■■
80
81 -1's turn to place a ○ piece
82 the number of simulations performed: 2732
83 the max size of the search tree for all moves 2732
84 Best Child Value: 10
85 Best Child Visits: 114
86 player2 move = (0, 7)
87 time used for this move:60.042568
88 ■■■■■■■■■■
89 □ . . . . . ○ ○ □
90 □ . . . . . ● . □

```

```

91  □ . . . . . □
92  □ . . . . . ● . . □
93  □ . ○ . . . ● . . □
94  □ . . . . . . . □
95  □ . . . . . . . □
96  □ . . . . . . . □
97  ▣ ■ ■ ■ ■ ■ ■ ■ ■
98
99  1's turn to place a ● piece
100 player1 move = (2, 6)
101 time used for this move:0.289681
102  ■ ■ ■ ■ ■ ■ ■ ■ ▣
103  □ . . . . . ○ ○ □
104  □ . . . . . ● . □
105  □ . . . . . ● . □
106  □ . . . . . ● . □
107  □ . ○ . . . ● . □
108  □ . . . . . . . □
109  □ . . . . . . . □
110  □ . . . . . . . □
111  ▣ ■ ■ ■ ■ ■ ■ ■ ■
112
113 -1's turn to place a ○ piece
114 2017-03-06 20:42:56.784 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_attributesForCharacterIndex:reply:)
    block performed very slowly (59.84 secs).
115 the number of simulations performed: 2783
116 2017-03-06 20:42:56.784 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_windowLevelWithReply:) block performed
    very slowly (57.84 secs).
117 the max size of the search tree for all moves 2783
118 Best Child Value: 39
119 Best Child Visits: 123
120 player2 move = (0, 5)
121 time used for this move:60.018344
122  ■ ■ ■ ■ ■ ■ ■ ■ ▣
123  □ . . . . . ○ ○ ○ □
124  □ . . . . . ● . □
125  □ . . . . . ● . □
126  □ . . . . . ● . □
127  □ . ○ . . . ● . □
128  □ . . . . . . . □
129  □ . . . . . . . □
130  □ . . . . . . . □
131  ▣ ■ ■ ■ ■ ■ ■ ■ ■
132

```

```

133 1's turn to place a ● piece
134 player1 move = (5, 3)
135 time used for this move:0.735289
136 ■■■■■■
137 □ . . . . ○ ○ ○ □
138 □ . . . . . ● . □
139 □ . . . . . ● . □
140 □ . . . . . ● . □
141 □ . ○ . . ● . . □
142 □ . . . ● . . . □
143 □ . . . . . . □
144 □ . . . . . . □
145 ■■■■■■
146
147 -1's turn to place a ○ piece
148 the number of simulations performed: 2639
149 the max size of the search tree for all moves 2639
150 Best Child Value: 64
151 Best Child Visits: 128
152 player2 move = (0, 4)
153 time used for this move:60.037985
154 ■■■■■■
155 □ . . . . ○ ○ ○ ○ □
156 □ . . . . . ● . □
157 □ . . . . . ● . □
158 □ . . . . . ● . □
159 □ . ○ . . ● . . □
160 □ . . . ● . . . □
161 □ . . . . . . □
162 □ . . . . . . □
163 ■■■■■■
164
165 1's turn to place a ● piece
166 player1 move = (0, 3)
167 time used for this move:1.506453
168 ■■■■■■
169 □ . . . ● ○ ○ ○ ○ □
170 □ . . . . . ● . □
171 □ . . . . . ● . □
172 □ . . . . . ● . □
173 □ . ○ . . ● . . □
174 □ . . . ● . . . □
175 □ . . . . . . □
176 □ . . . . . . □
177 ■■■■■■
178
179 -1's turn to place a ○ piece
180 the number of simulations performed: 2780
181 the max size of the search tree for all moves 2780
182 Best Child Value: 85

```

```

183 Best Child Visits: 171
184 player2 move = (2, 2)
185 time used for this move:60.051867
186 ■■■■■■
187 □ . . . ● ○ ○ ○ ○ □
188 □ . . . . . ● . □
189 □ . . ○ . . . ● . □
190 □ . . . . . ● . . □
191 □ . ○ . . . ● . . . □
192 □ . . . . ● . . . . □
193 □ . . . . . . . . □
194 □ . . . . . . . . □
195 ■■■■■■
196
197 1's turn to place a ● piece
198 player1 move = (1, 3)
199 time used for this move:0.238109
200 ■■■■■■
201 □ . . . ● ○ ○ ○ ○ □
202 □ . . . ● . . ● . □
203 □ . . ○ . . . ● . □
204 □ . . . . . ● . . □
205 □ . ○ . . . ● . . . □
206 □ . . . . ● . . . . □
207 □ . . . . . . . . □
208 □ . . . . . . . . □
209 ■■■■■■
210
211 -1's turn to place a ○ piece
212 the number of simulations performed: 2845
213 the max size of the search tree for all moves 2845
214 Best Child Value: 89
215 Best Child Visits: 285
216 player2 move = (2, 3)
217 time used for this move:60.020913
218 ■■■■■■
219 □ . . . ● ○ ○ ○ ○ □
220 □ . . . ● . . ● . □
221 □ . . ○ ○ . . ● . □
222 □ . . . . . ● . . □
223 □ . ○ . . . ● . . . □
224 □ . . . . ● . . . . □
225 □ . . . . . . . . □
226 □ . . . . . . . . □
227 ■■■■■■
228
229 1's turn to place a ● piece
230 player1 move = (1, 4)
231 time used for this move:0.220171
232 ■■■■■■

```

```

233 □ . . . ● ○ ○ ○ ○ □
234 □ . . . ● ● . ● . □
235 □ . . ○ ○ . . ● . □
236 □ . . . . . ● . . □
237 □ . ○ . . ● . . . □
238 □ . . . ● . . . . □
239 □ . . . . . . . . □
240 □ . . . . . . . . □
241   ■ ■ ■ ■ ■ ■ ■ ■
242
243 -1's turn to place a ○ piece
244 2017-03-06 20:50:24.245 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_attributesForCharacterIndex:reply:)
    block performed very slowly (59.91 secs).
245 the number of simulations performed: 2977
246 2017-03-06 20:50:24.246 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_windowLevelWithReply:) block performed
    very slowly (57.91 secs).
247 the max size of the search tree for all moves 2977
248 Best Child Value: 103
249 Best Child Visits: 615
250 player2 move = (1, 5)
251 time used for this move:60.025539
252   ■ ■ ■ ■ ■ ■ ■ ■
253 □ . . . ● ○ ○ ○ ○ □
254 □ . . . ● ● ○ ● . □
255 □ . . ○ ○ . . ● . □
256 □ . . . . . ● . . □
257 □ . ○ . . ● . . . □
258 □ . . . ● . . . . □
259 □ . . . . . . . . □
260 □ . . . . . . . . □
261   ■ ■ ■ ■ ■ ■ ■ ■
262
263 1's turn to place a ● piece
264 player1 move = (2, 4)
265 time used for this move:0.127711
266   ■ ■ ■ ■ ■ ■ ■ ■
267 □ . . . ● ○ ○ ○ ○ □
268 □ . . . ● ● ○ ● . □
269 □ . . ○ ○ ● . ● . □
270 □ . . . . . ● . . □
271 □ . ○ . . ● . . . □
272 □ . . . ● . . . . □
273 □ . . . . . . . . □
274 □ . . . . . . . . □

```

```

275      ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
276
277 -1's turn to place a ○ piece
278 2017-03-06 20:51:32.356 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_attributesForCharacterIndex:reply:)
    block performed very slowly (59.85 secs).
279 the number of simulations performed: 3197
280 2017-03-06 20:51:32.357 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_windowLevelWithReply:) block performed
    very slowly (57.85 secs).
281 the max size of the search tree for all moves 3197
282 Best Child Value:  -46
283 Best Child Visits:  176
284 player2 move = (2, 5)
285 time used for this move:60.02013
286 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
287 □ . . . ● ○ ○ ○ ○ □
288 □ . . . ● ● ○ ● . □
289 □ . . ○ ○ ● ○ ● . □
290 □ . . . . . ● . . □
291 □ . ○ . . ● . . . □
292 □ . . . ● . . . . □
293 □ . . . . . . . . □
294 □ . . . . . . . . □
295 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
296
297 1's turn to place a ● piece
298 player1 move = (3, 4)
299 time used for this move:0.106644
300 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
301 □ . . . ● ○ ○ ○ ○ □
302 □ . . . ● ● ○ ● . □
303 □ . . ○ ○ ● ○ ● . □
304 □ . . . . ● ● . . □
305 □ . ○ . . ● . . . □
306 □ . . . ● . . . . □
307 □ . . . . . . . . □
308 □ . . . . . . . . □
309 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
310
311 -1's turn to place a ○ piece
312 the number of simulations performed: 3474
313 the max size of the search tree for all moves 3474
314 Best Child Value:  -101
315 Best Child Visits:  163
316 player2 move = (7, 3)

```

```

317 time used for this move:60.017847
318 ■■■■■■
319 □ . . . ● ○ ○ ○ ○ □
320 □ . . . ● ● ○ ● . □
321 □ . . ○ ○ ● ○ ● . □
322 □ . . . . ● ● . . □
323 □ . ○ . . ● . . . □
324 □ . . . . ● . . . □
325 □ . . . . . . . . □
326 □ . . . . ○ . . . □
327 ■■■■■■
328
329 1's turn to place a ● piece
330 player1 move = (6, 2)
331 time used for this move:0.0965130000001
332 ■■■■■■
333 □ . . . ● ○ ○ ○ ○ □
334 □ . . . ● ● ○ ● . □
335 □ . . ○ ○ ● ○ ● . □
336 □ . . . . ● ● . . □
337 □ . ○ . . ● . . . □
338 □ . . . . ● . . . □
339 □ . . ● . . . . □
340 □ . . . . ○ . . . □
341 ■■■■■■
342
343 -1's turn to place a ○ piece
344 2017-03-06 20:52:38.301 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_attributesForCharacterIndex:reply:)
    block performed very slowly (59.76 secs).
345 2017-03-06 20:52:38.301 Python[21157:2082683] IMKClient
    Stall detected, *please Report* your user scenario
    attaching a spindump (or sysdiagnose) that captures the
    problem - (imkxpc_windowLevelWithReply:) block performed
    very slowly (57.76 secs).
346 the number of simulations performed: 3644
347 the max size of the search tree for all moves 3644
348 Best Child Value: -165
349 Best Child Visits: 251
350 player2 move = (7, 1)
351 time used for this move:60.022927
352 ■■■■■■
353 □ . . . ● ○ ○ ○ ○ □
354 □ . . . ● ● ○ ● . □
355 □ . . ○ ○ ● ○ ● . □
356 □ . . . . ● ● . . □
357 □ . ○ . . ● . . . □
358 □ . . . . ● . . . □

```



```

359      □ . . ● . . . . . □
360      □ . ○ . ○ . . . . □
361      ▣ ■ ■ ■ ■ ■ ■ ■ ■
362
363 1's turn to place a ● piece
364 player1 move = (7, 2)
365 time used for this move:0.913956
366      ■ ■ ■ ■ ■ ■ ■ ▣
367      □ . . . ● ○ ○ ○ ○ □
368      □ . . . ● ● ○ ● . □
369      □ . . ○ ○ ● ○ ● . □
370      □ . . . . ● ● . . □
371      □ . ○ . . ● . . . □
372      □ . . . ● . . . . □
373      □ . . ● . . . . . □
374      □ . ○ ● ○ . . . . □
375      ▣ ■ ■ ■ ■ ■ ■ ■ ■
376
377 1's turn to place a ● piece
378 1 wins
379

```