

unknown

```
1 "E:\1_2\3_2\1_2\1_2\1_2\1_2\1_LW_2\6\2 python code\01_My_Python_Code\Scripts\python.exe" "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\pydevconsole.py" --mode=client --port=12103
2
3 import sys; print('Python %s on %s! %s (sys.version, sys.platform)')
4 sys.path.extend(['E:\1_2\3_2\1_2\1_2\1_2\1_LW_2\6\2 python code\01_My_Python_Code\main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1_2\3_2\1_2\1_2\1_2\1_LW_2\6\2 python code\01_My_Python_Code'])
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_2\3_2\1_2\1_2\1_2\1_LW_2\6\2 python code\01_My_Python_Code/main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1_2\3_2\1_2\1_2\1_2\1_LW_2\6\2 python code\01_My_Python_Code')
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11 Waiting 1s....
12
13 This is the R_14_5_standerd_test.xlsx optimization process.
14
15 Start
16 Read basic data
17 V = 14
18 T = 36
19 Q = 23
20 L = 30
21 PSO parameter setting:
22 Trail = 31
23 maxIter_num = 20
24 W_inertia = 2.0
25 oder_type_num = 25
26 c1 = 1.5
27 c2 = 1.5
28 r1 = 0.5581807141368915
29 r2 = 0.5581807141368915
30 Begin iteration:
31
32 iter = 0
33 cord_individual_obj[individual_i, :] = [ 0.  9. 169. 178.]
34 cord_individual_obj[individual_i, :] = [ 1. 11. 128. 139.]
35 cord_individual_obj[individual_i, :] = [ 2.  8. 113. 121.]
36 cord_individual_obj[individual_i, :] = [ 3. 10. 90. 100.]
37 cord_individual_obj[individual_i, :] = [ 4.  9. 119. 128.]
38 cord_individual_obj[individual_i, :] = [ 5.  8. 117. 125.]
39 cord_individual_obj[individual_i, :] = [ 6.  9. 179. 188.]
40 cord_individual_obj[individual_i, :] = [ 7.  7. 63. 70.]
41 cord_individual_obj[individual_i, :] = [ 8.  7. 130. 137.]
42 cord_individual_obj[individual_i, :] = [ 9.  9. 94. 103.]
43 cord_individual_obj[individual_i, :] = [ 10. 11. 125. 136.]
44 cord_individual_obj[individual_i, :] = [ 11.  9. 134. 143.]
45 cord_individual_obj[individual_i, :] = [ 12.  8. 114. 122.]
46 cord_individual_obj[individual_i, :] = [ 13.  8. 139. 147.]
47 cord_individual_obj[individual_i, :] = [ 14.  8. 85. 93.]
48 cord_individual_obj[individual_i, :] = [ 15.  8. 110. 118.]
49 cord_individual_obj[individual_i, :] = [ 16.  9. 138. 147.]
50 cord_individual_obj[individual_i, :] = [ 17.  8. 112. 120.]
51 cord_individual_obj[individual_i, :] = [ 18.  8. 161. 169.]
52 cord_individual_obj[individual_i, :] = [ 19.  9. 164. 173.]
53 cord_individual_obj[individual_i, :] = [ 20.  7. 142. 149.]
54 cord_individual_obj[individual_i, :] = [ 21.  8. 112. 120.]
55 cord_individual_obj[individual_i, :] = [ 22.  7. 99. 106.]
56 cord_individual_obj[individual_i, :] = [ 23.  8. 97. 105.]
57 cord_individual_obj[individual_i, :] = [ 24.  8. 179. 187.]
58
59 min(cord_individual_obj[:, 3]) = 70.0
60 historl_G_best_iter[iter, 3] = 70.0
61 Begin iteration:
62
63 iter = 1
64 cord_individual_obj[individual_i, :] = [ 0.  9. 104. 113.]
65 cord_individual_obj[individual_i, :] = [ 1.  7. 61. 68.]
66 cord_individual_obj[individual_i, :] = [ 2.  8. 208. 216.]
67 cord_individual_obj[individual_i, :] = [ 3.  8. 90. 98.]
68 cord_individual_obj[individual_i, :] = [ 4.  9. 123. 132.]
69 cord_individual_obj[individual_i, :] = [ 5.  9. 100. 109.]
70 cord_individual_obj[individual_i, :] = [ 6.  7. 63. 70.]
71 cord_individual_obj[individual_i, :] = [ 7.  10. 126. 136.]
72 cord_individual_obj[individual_i, :] = [ 8.  6. 134. 140.]
73 cord_individual_obj[individual_i, :] = [ 9.  8. 81. 89.]
74 cord_individual_obj[individual_i, :] = [ 10. 10. 89. 99.]
75 cord_individual_obj[individual_i, :] = [ 11. 10. 174. 184.]
76 cord_individual_obj[individual_i, :] = [ 12.  8. 91. 99.]
77 cord_individual_obj[individual_i, :] = [ 13.  7. 129. 136.]
78 cord_individual_obj[individual_i, :] = [ 14.  8. 80. 88.]
79 cord_individual_obj[individual_i, :] = [ 15.  9. 68. 77.]
```

```

80 cord_individual_obj[indivial_i,:] = [ 16. 7. 94. 101.]
81 cord_individual_obj[indivial_i,:] = [ 17. 7. 121. 128.]
82 cord_individual_obj[indivial_i,:] = [ 18. 7. 142. 149.]
83 cord_individual_obj[indivial_i,:] = [ 19. 9. 171. 180.]
84 cord_individual_obj[indivial_i,:] = [20. 8. 87. 95.]
85 cord_individual_obj[indivial_i,:] = [ 21. 8. 146. 154.]
86 cord_individual_obj[indivial_i,:] = [ 22. 7. 185. 192.]
87 cord_individual_obj[indivial_i,:] = [ 23. 8. 119. 127.]
88 cord_individual_obj[indivial_i,:] = [ 24. 9. 61. 70.]
89
90 min(cord_individual_obj[:,3]) = 68.0
91 historl_G_best_iter[iter, 3] = 68.0
92 Begin iteration:
93
94 iter = 2
95 cord_individual_obj[indivial_i,:] = [ 0. 9. 133. 142.]
96 cord_individual_obj[indivial_i,:] = [ 1. 10. 77. 87.]
97 cord_individual_obj[indivial_i,:] = [ 2. 7. 61. 68.]
98 cord_individual_obj[indivial_i,:] = [ 3. 10. 108. 118.]
99 cord_individual_obj[indivial_i,:] = [ 4. 11. 111. 122.]
100 cord_individual_obj[indivial_i,:] = [ 5. 10. 100. 110.]
101 cord_individual_obj[indivial_i,:] = [ 6. 10. 100. 110.]
102 cord_individual_obj[indivial_i,:] = [ 7. 7. 131. 138.]
103 cord_individual_obj[indivial_i,:] = [ 8. 9. 144. 153.]
104 cord_individual_obj[indivial_i,:] = [ 9. 9. 106. 115.]
105 cord_individual_obj[indivial_i,:] = [ 10. 10. 107. 117.]
106 cord_individual_obj[indivial_i,:] = [ 11. 7. 76. 83.]
107 cord_individual_obj[indivial_i,:] = [ 12. 10. 90. 100.]
108 cord_individual_obj[indivial_i,:] = [ 13. 10. 116. 126.]
109 cord_individual_obj[indivial_i,:] = [ 14. 8. 93. 101.]
110 cord_individual_obj[indivial_i,:] = [ 15. 9. 105. 114.]
111 cord_individual_obj[indivial_i,:] = [ 16. 8. 139. 147.]
112 cord_individual_obj[indivial_i,:] = [ 17. 9. 123. 132.]
113 cord_individual_obj[indivial_i,:] = [ 18. 10. 126. 136.]
114 cord_individual_obj[indivial_i,:] = [ 19. 9. 95. 104.]
115 cord_individual_obj[indivial_i,:] = [ 20. 9. 100. 109.]
116 cord_individual_obj[indivial_i,:] = [ 21. 9. 88. 97.]
117 cord_individual_obj[indivial_i,:] = [ 22. 8. 106. 114.]
118 cord_individual_obj[indivial_i,:] = [ 23. 8. 116. 124.]
119 cord_individual_obj[indivial_i,:] = [ 24. 6. 62. 68.]
120
121 min(cord_individual_obj[:,3]) = 68.0
122 historl_G_best_iter[iter, 3] = 68.0
123 Begin iteration:
124
125 iter = 3
126 cord_individual_obj[indivial_i,:] = [ 0. 7. 211. 218.]
127 cord_individual_obj[indivial_i,:] = [ 1. 9. 56. 65.]
128 cord_individual_obj[indivial_i,:] = [ 2. 9. 122. 131.]
129 cord_individual_obj[indivial_i,:] = [ 3. 7. 130. 137.]
130 cord_individual_obj[indivial_i,:] = [ 4. 11. 104. 115.]
131 cord_individual_obj[indivial_i,:] = [ 5. 7. 119. 126.]
132 cord_individual_obj[indivial_i,:] = [ 6. 8. 142. 150.]
133 cord_individual_obj[indivial_i,:] = [ 7. 8. 108. 116.]
134 cord_individual_obj[indivial_i,:] = [ 8. 7. 61. 68.]
135 cord_individual_obj[indivial_i,:] = [ 9. 6. 107. 113.]
136 cord_individual_obj[indivial_i,:] = [ 10. 7. 117. 124.]
137 cord_individual_obj[indivial_i,:] = [ 11. 10. 69. 79.]
138 cord_individual_obj[indivial_i,:] = [ 12. 6. 127. 133.]
139 cord_individual_obj[indivial_i,:] = [ 13. 8. 199. 207.]
140 cord_individual_obj[indivial_i,:] = [ 14. 9. 82. 91.]
141 cord_individual_obj[indivial_i,:] = [ 15. 9. 97. 106.]
142 cord_individual_obj[indivial_i,:] = [ 16. 8. 103. 111.]
143 cord_individual_obj[indivial_i,:] = [ 17. 7. 105. 112.]
144 cord_individual_obj[indivial_i,:] = [ 18. 9. 75. 84.]
145 cord_individual_obj[indivial_i,:] = [ 19. 9. 91. 100.]
146 cord_individual_obj[indivial_i,:] = [ 20. 9. 121. 130.]
147 cord_individual_obj[indivial_i,:] = [ 21. 8. 114. 122.]
148 cord_individual_obj[indivial_i,:] = [ 22. 9. 139. 148.]
149 cord_individual_obj[indivial_i,:] = [ 23. 9. 135. 144.]
150 cord_individual_obj[indivial_i,:] = [ 24. 7. 81. 88.]
151
152 min(cord_individual_obj[:,3]) = 65.0
153 historl_G_best_iter[iter, 3] = 65.0
154 Begin iteration:
155
156 iter = 4
157 cord_individual_obj[indivial_i,:] = [ 0. 9. 56. 65.]
158 cord_individual_obj[indivial_i,:] = [ 1. 11. 101. 112.]
159 cord_individual_obj[indivial_i,:] = [ 2. 9. 78. 87.]
160 cord_individual_obj[indivial_i,:] = [ 3. 9. 124. 133.]
161 cord_individual_obj[indivial_i,:] = [ 4. 10. 83. 93.]
162 cord_individual_obj[indivial_i,:] = [ 5. 9. 92. 101.]
163 cord_individual_obj[indivial_i,:] = [ 6. 8. 182. 190.]

```

```

164 cord_individual_obj[indivial_i, :] = [ 7. 8. 143. 151.]
165 cord_individual_obj[indivial_i, :] = [ 8. 8. 64. 72.]
166 cord_individual_obj[indivial_i, :] = [ 9. 7. 159. 166.]
167 cord_individual_obj[indivial_i, :] = [ 10. 11. 121. 132.]
168 cord_individual_obj[indivial_i, :] = [ 11. 8. 129. 137.]
169 cord_individual_obj[indivial_i, :] = [ 12. 10. 94. 104.]
170 cord_individual_obj[indivial_i, :] = [ 13. 9. 148. 157.]
171 cord_individual_obj[indivial_i, :] = [ 14. 7. 121. 128.]
172 cord_individual_obj[indivial_i, :] = [ 15. 7. 91. 98.]
173 cord_individual_obj[indivial_i, :] = [ 16. 9. 84. 93.]
174 cord_individual_obj[indivial_i, :] = [ 17. 8. 110. 118.]
175 cord_individual_obj[indivial_i, :] = [ 18. 8. 137. 145.]
176 cord_individual_obj[indivial_i, :] = [ 19. 8. 95. 103.]
177 cord_individual_obj[indivial_i, :] = [ 20. 8. 49. 57.]
178 cord_individual_obj[indivial_i, :] = [ 21. 8. 105. 113.]
179 cord_individual_obj[indivial_i, :] = [ 22. 10. 137. 147.]
180 cord_individual_obj[indivial_i, :] = [ 23. 8. 155. 163.]
181 cord_individual_obj[indivial_i, :] = [ 24. 7. 138. 145.]
182
183 min(cord_individual_obj[:, 3]) = 57.0
184 historl_G_best_iter[iter, 3] = 57.0
185 Begin iteration:
186
187 iter = 5
188 cord_individual_obj[indivial_i, :] = [ 0. 8. 112. 120.]
189 cord_individual_obj[indivial_i, :] = [ 1. 7. 121. 128.]
190 cord_individual_obj[indivial_i, :] = [ 2. 8. 129. 137.]
191 cord_individual_obj[indivial_i, :] = [ 3. 11. 141. 152.]
192 cord_individual_obj[indivial_i, :] = [ 4. 9. 101. 110.]
193 cord_individual_obj[indivial_i, :] = [ 5. 8. 78. 86.]
194 cord_individual_obj[indivial_i, :] = [ 6. 8. 49. 57.]
195 cord_individual_obj[indivial_i, :] = [ 7. 9. 107. 116.]
196 cord_individual_obj[indivial_i, :] = [ 8. 7. 109. 116.]
197 cord_individual_obj[indivial_i, :] = [ 9. 7. 72. 79.]
198 cord_individual_obj[indivial_i, :] = [ 10. 7. 118. 125.]
199 cord_individual_obj[indivial_i, :] = [ 11. 8. 111. 119.]
200 cord_individual_obj[indivial_i, :] = [ 12. 11. 119. 130.]
201 cord_individual_obj[indivial_i, :] = [ 13. 8. 153. 161.]
202 cord_individual_obj[indivial_i, :] = [ 14. 8. 206. 214.]
203 cord_individual_obj[indivial_i, :] = [ 15. 9. 126. 135.]
204 cord_individual_obj[indivial_i, :] = [ 16. 7. 123. 130.]
205 cord_individual_obj[indivial_i, :] = [ 17. 9. 80. 89.]
206 cord_individual_obj[indivial_i, :] = [ 18. 7. 167. 174.]
207 cord_individual_obj[indivial_i, :] = [ 19. 7. 106. 113.]
208 cord_individual_obj[indivial_i, :] = [ 20. 8. 111. 119.]
209 cord_individual_obj[indivial_i, :] = [ 21. 7. 85. 92.]
210 cord_individual_obj[indivial_i, :] = [ 22. 9. 113. 122.]
211 cord_individual_obj[indivial_i, :] = [ 23. 7. 84. 91.]
212 cord_individual_obj[indivial_i, :] = [ 24. 8. 76. 84.]
213
214 min(cord_individual_obj[:, 3]) = 57.0
215 historl_G_best_iter[iter, 3] = 57.0
216 Begin iteration:
217
218 iter = 6
219 cord_individual_obj[indivial_i, :] = [ 0. 10. 163. 173.]
220 cord_individual_obj[indivial_i, :] = [ 1. 8. 113. 121.]
221 cord_individual_obj[indivial_i, :] = [ 2. 10. 138. 148.]
222 cord_individual_obj[indivial_i, :] = [ 3. 10. 118. 128.]
223 cord_individual_obj[indivial_i, :] = [ 4. 9. 138. 147.]
224 cord_individual_obj[indivial_i, :] = [ 5. 10. 101. 111.]
225 cord_individual_obj[indivial_i, :] = [ 6. 8. 169. 177.]
226 cord_individual_obj[indivial_i, :] = [ 7. 7. 109. 116.]
227 cord_individual_obj[indivial_i, :] = [ 8. 10. 133. 143.]
228 cord_individual_obj[indivial_i, :] = [ 9. 10. 89. 99.]
229 cord_individual_obj[indivial_i, :] = [ 10. 10. 167. 177.]
230 cord_individual_obj[indivial_i, :] = [ 11. 9. 105. 114.]
231 cord_individual_obj[indivial_i, :] = [ 12. 9. 98. 107.]
232 cord_individual_obj[indivial_i, :] = [ 13. 9. 96. 105.]
233 cord_individual_obj[indivial_i, :] = [ 14. 8. 49. 57.]
234 cord_individual_obj[indivial_i, :] = [ 15. 10. 121. 131.]
235 cord_individual_obj[indivial_i, :] = [ 16. 7. 135. 142.]
236 cord_individual_obj[indivial_i, :] = [ 17. 8. 121. 129.]
237 cord_individual_obj[indivial_i, :] = [ 18. 8. 112. 120.]
238 cord_individual_obj[indivial_i, :] = [ 19. 8. 152. 160.]
239 cord_individual_obj[indivial_i, :] = [ 20. 10. 132. 142.]
240 cord_individual_obj[indivial_i, :] = [ 21. 8. 120. 128.]
241 cord_individual_obj[indivial_i, :] = [ 22. 8. 113. 121.]
242 cord_individual_obj[indivial_i, :] = [ 23. 9. 151. 160.]
243 cord_individual_obj[indivial_i, :] = [ 24. 6. 133. 139.]
244
245 min(cord_individual_obj[:, 3]) = 57.0
246 historl_G_best_iter[iter, 3] = 57.0
247 Begin iteration:

```

```

248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [ 0. 9. 104. 113.]
251 cord_individual_obj[indivial_i, :] = [ 1. 9. 116. 125.]
252 cord_individual_obj[indivial_i, :] = [ 2. 11. 164. 175.]
253 cord_individual_obj[indivial_i, :] = [ 3. 9. 155. 164.]
254 cord_individual_obj[indivial_i, :] = [ 4. 8. 176. 184.]
255 cord_individual_obj[indivial_i, :] = [ 5. 8. 180. 188.]
256 cord_individual_obj[indivial_i, :] = [ 6. 8. 49. 57.]
257 cord_individual_obj[indivial_i, :] = [ 7. 9. 143. 152.]
258 cord_individual_obj[indivial_i, :] = [ 8. 8. 120. 128.]
259 cord_individual_obj[indivial_i, :] = [ 9. 9. 165. 174.]
260 cord_individual_obj[indivial_i, :] = [ 10. 11. 134. 145.]
261 cord_individual_obj[indivial_i, :] = [ 11. 10. 137. 147.]
262 cord_individual_obj[indivial_i, :] = [ 12. 9. 127. 136.]
263 cord_individual_obj[indivial_i, :] = [ 13. 9. 154. 163.]
264 cord_individual_obj[indivial_i, :] = [ 14. 8. 170. 178.]
265 cord_individual_obj[indivial_i, :] = [ 15. 9. 150. 159.]
266 cord_individual_obj[indivial_i, :] = [ 16. 9. 150. 159.]
267 cord_individual_obj[indivial_i, :] = [ 17. 8. 141. 149.]
268 cord_individual_obj[indivial_i, :] = [ 18. 9. 131. 140.]
269 cord_individual_obj[indivial_i, :] = [ 19. 7. 141. 148.]
270 cord_individual_obj[indivial_i, :] = [ 20. 8. 165. 173.]
271 cord_individual_obj[indivial_i, :] = [ 21. 7. 114. 121.]
272 cord_individual_obj[indivial_i, :] = [ 22. 8. 146. 154.]
273 cord_individual_obj[indivial_i, :] = [ 23. 8. 96. 104.]
274 cord_individual_obj[indivial_i, :] = [ 24. 8. 128. 136.]
275

276 min(cord_individual_obj[:, 3]) = 57.0
277 historl_G_best_iter[iter, 3] = 57.0
278 Begin iteration:
279
280 iter = 8
281 cord_individual_obj[indivial_i, :] = [ 0. 10. 159. 169.]
282 cord_individual_obj[indivial_i, :] = [ 1. 8. 84. 92.]
283 cord_individual_obj[indivial_i, :] = [ 2. 11. 163. 174.]
284 cord_individual_obj[indivial_i, :] = [ 3. 9. 185. 194.]
285 cord_individual_obj[indivial_i, :] = [ 4. 10. 124. 134.]
286 cord_individual_obj[indivial_i, :] = [ 5. 8. 49. 57.]
287 cord_individual_obj[indivial_i, :] = [ 6. 7. 176. 183.]
288 cord_individual_obj[indivial_i, :] = [ 7. 9. 120. 129.]
289 cord_individual_obj[indivial_i, :] = [ 8. 8. 123. 131.]
290 cord_individual_obj[indivial_i, :] = [ 9. 6. 113. 119.]
291 cord_individual_obj[indivial_i, :] = [ 10. 7. 103. 110.]
292 cord_individual_obj[indivial_i, :] = [ 11. 10. 145. 155.]
293 cord_individual_obj[indivial_i, :] = [ 12. 7. 128. 135.]
294 cord_individual_obj[indivial_i, :] = [ 13. 9. 134. 143.]
295 cord_individual_obj[indivial_i, :] = [ 14. 9. 160. 169.]
296 cord_individual_obj[indivial_i, :] = [ 15. 10. 123. 133.]
297 cord_individual_obj[indivial_i, :] = [ 16. 9. 113. 122.]
298 cord_individual_obj[indivial_i, :] = [ 17. 8. 126. 134.]
299 cord_individual_obj[indivial_i, :] = [ 18. 7. 122. 129.]
300 cord_individual_obj[indivial_i, :] = [ 19. 8. 135. 143.]
301 cord_individual_obj[indivial_i, :] = [ 20. 8. 98. 106.]
302 cord_individual_obj[indivial_i, :] = [ 21. 7. 137. 144.]
303 cord_individual_obj[indivial_i, :] = [ 22. 9. 134. 143.]
304 cord_individual_obj[indivial_i, :] = [ 23. 10. 164. 174.]
305 cord_individual_obj[indivial_i, :] = [ 24. 7. 146. 153.]
306

307 min(cord_individual_obj[:, 3]) = 57.0
308 historl_G_best_iter[iter, 3] = 57.0
309 Begin iteration:
310
311 iter = 9
312 cord_individual_obj[indivial_i, :] = [ 0. 7. 102. 109.]
313 cord_individual_obj[indivial_i, :] = [ 1. 8. 114. 122.]
314 cord_individual_obj[indivial_i, :] = [ 2. 8. 98. 106.]
315 cord_individual_obj[indivial_i, :] = [ 3. 8. 49. 57.]
316 cord_individual_obj[indivial_i, :] = [ 4. 9. 116. 125.]
317 cord_individual_obj[indivial_i, :] = [ 5. 8. 146. 154.]
318 cord_individual_obj[indivial_i, :] = [ 6. 7. 76. 83.]
319 cord_individual_obj[indivial_i, :] = [ 7. 9. 204. 213.]
320 cord_individual_obj[indivial_i, :] = [ 8. 8. 93. 101.]
321 cord_individual_obj[indivial_i, :] = [ 9. 10. 92. 102.]
322 cord_individual_obj[indivial_i, :] = [ 10. 10. 127. 137.]
323 cord_individual_obj[indivial_i, :] = [ 11. 9. 104. 113.]
324 cord_individual_obj[indivial_i, :] = [ 12. 11. 83. 94.]
325 cord_individual_obj[indivial_i, :] = [ 13. 8. 117. 125.]
326 cord_individual_obj[indivial_i, :] = [ 14. 8. 100. 108.]
327 cord_individual_obj[indivial_i, :] = [ 15. 7. 129. 136.]
328 cord_individual_obj[indivial_i, :] = [ 16. 7. 81. 88.]
329 cord_individual_obj[indivial_i, :] = [ 17. 8. 86. 94.]
330 cord_individual_obj[indivial_i, :] = [ 18. 9. 106. 115.]
331 cord_individual_obj[indivial_i, :] = [ 19. 7. 89. 96.]

```

```

332 cord_individual_obj[indivial_i,:] = [ 20. 6. 187. 193.]
333 cord_individual_obj[indivial_i,:] = [ 21. 11. 102. 113.]
334 cord_individual_obj[indivial_i,:] = [ 22. 9. 138. 147.]
335 cord_individual_obj[indivial_i,:] = [ 23. 8. 104. 112.]
336 cord_individual_obj[indivial_i,:] = [ 24. 8. 143. 151.]
337
338 min(cord_individual_obj[:,3]) = 57.0
339 histol_G_best_iter[iter,3] = 57.0
340 Begin iteration:
341
342 iter = 10
343 cord_individual_obj[indivial_i,:] = [ 0. 9. 101. 110.]
344 cord_individual_obj[indivial_i,:] = [ 1. 8. 119. 127.]
345 cord_individual_obj[indivial_i,:] = [ 2. 8. 78. 86.]
346 cord_individual_obj[indivial_i,:] = [ 3. 9. 164. 173.]
347 cord_individual_obj[indivial_i,:] = [ 4. 9. 159. 168.]
348 cord_individual_obj[indivial_i,:] = [ 5. 9. 165. 174.]
349 cord_individual_obj[indivial_i,:] = [ 6. 9. 191. 200.]
350 cord_individual_obj[indivial_i,:] = [ 7. 8. 49. 57.]
351 cord_individual_obj[indivial_i,:] = [ 8. 7. 110. 117.]
352 cord_individual_obj[indivial_i,:] = [ 9. 7. 152. 159.]
353 cord_individual_obj[indivial_i,:] = [ 10. 9. 97. 106.]
354 cord_individual_obj[indivial_i,:] = [ 11. 9. 132. 141.]
355 cord_individual_obj[indivial_i,:] = [ 12. 10. 114. 124.]
356 cord_individual_obj[indivial_i,:] = [ 13. 8. 135. 143.]
357 cord_individual_obj[indivial_i,:] = [ 14. 8. 147. 155.]
358 cord_individual_obj[indivial_i,:] = [ 15. 9. 106. 115.]
359 cord_individual_obj[indivial_i,:] = [ 16. 11. 111. 122.]
360 cord_individual_obj[indivial_i,:] = [ 17. 8. 123. 131.]
361 cord_individual_obj[indivial_i,:] = [ 18. 10. 133. 143.]
362 cord_individual_obj[indivial_i,:] = [ 19. 7. 147. 154.]
363 cord_individual_obj[indivial_i,:] = [ 20. 8. 85. 93.]
364 cord_individual_obj[indivial_i,:] = [ 21. 11. 157. 168.]
365 cord_individual_obj[indivial_i,:] = [ 22. 10. 115. 125.]
366 cord_individual_obj[indivial_i,:] = [ 23. 9. 169. 178.]
367 cord_individual_obj[indivial_i,:] = [ 24. 8. 170. 178.]
368
369 min(cord_individual_obj[:,3]) = 57.0
370 histol_G_best_iter[iter,3] = 57.0
371 Begin iteration:
372
373 iter = 11
374 cord_individual_obj[indivial_i,:] = [ 0. 8. 125. 133.]
375 cord_individual_obj[indivial_i,:] = [ 1. 8. 86. 94.]
376 cord_individual_obj[indivial_i,:] = [ 2. 7. 88. 95.]
377 cord_individual_obj[indivial_i,:] = [ 3. 9. 118. 127.]
378 cord_individual_obj[indivial_i,:] = [ 4. 11. 119. 130.]
379 cord_individual_obj[indivial_i,:] = [ 5. 8. 158. 166.]
380 cord_individual_obj[indivial_i,:] = [ 6. 8. 49. 57.]
381 cord_individual_obj[indivial_i,:] = [ 7. 9. 133. 142.]
382 cord_individual_obj[indivial_i,:] = [ 8. 9. 96. 105.]
383 cord_individual_obj[indivial_i,:] = [ 9. 9. 120. 129.]
384 cord_individual_obj[indivial_i,:] = [ 10. 8. 99. 107.]
385 cord_individual_obj[indivial_i,:] = [ 11. 11. 96. 107.]
386 cord_individual_obj[indivial_i,:] = [ 12. 11. 79. 90.]
387 cord_individual_obj[indivial_i,:] = [ 13. 10. 97. 107.]
388 cord_individual_obj[indivial_i,:] = [ 14. 9. 148. 157.]
389 cord_individual_obj[indivial_i,:] = [ 15. 8. 139. 147.]
390 cord_individual_obj[indivial_i,:] = [ 16. 9. 113. 122.]
391 cord_individual_obj[indivial_i,:] = [ 17. 7. 187. 194.]
392 cord_individual_obj[indivial_i,:] = [ 18. 8. 136. 144.]
393 cord_individual_obj[indivial_i,:] = [ 19. 8. 143. 151.]
394 cord_individual_obj[indivial_i,:] = [ 20. 10. 118. 128.]
395 cord_individual_obj[indivial_i,:] = [ 21. 9. 90. 99.]
396 cord_individual_obj[indivial_i,:] = [ 22. 9. 52. 61.]
397 cord_individual_obj[indivial_i,:] = [ 23. 9. 67. 76.]
398 cord_individual_obj[indivial_i,:] = [ 24. 6. 103. 109.]
399
400 min(cord_individual_obj[:,3]) = 57.0
401 histol_G_best_iter[iter,3] = 57.0
402 Begin iteration:
403
404 iter = 12
405 cord_individual_obj[indivial_i,:] = [ 0. 8. 138. 146.]
406 cord_individual_obj[indivial_i,:] = [ 1. 9. 131. 140.]
407 cord_individual_obj[indivial_i,:] = [ 2. 9. 140. 149.]
408 cord_individual_obj[indivial_i,:] = [ 3. 9. 118. 127.]
409 cord_individual_obj[indivial_i,:] = [ 4. 10. 71. 81.]
410 cord_individual_obj[indivial_i,:] = [ 5. 8. 105. 113.]
411 cord_individual_obj[indivial_i,:] = [ 6. 8. 169. 177.]
412 cord_individual_obj[indivial_i,:] = [ 7. 10. 140. 150.]
413 cord_individual_obj[indivial_i,:] = [ 8. 8. 89. 97.]
414 cord_individual_obj[indivial_i,:] = [ 9. 9. 128. 137.]
415 cord_individual_obj[indivial_i,:] = [ 10. 8. 112. 120.]

```

```

416 cord_individual_obj[indivial_i,:] = [ 11. 7. 97. 104.]
417 cord_individual_obj[indivial_i,:] = [12. 10. 62. 72.]
418 cord_individual_obj[indivial_i,:] = [ 13. 10. 109. 119.]
419 cord_individual_obj[indivial_i,:] = [ 14. 7. 104. 111.]
420 cord_individual_obj[indivial_i,:] = [ 15. 9. 124. 133.]
421 cord_individual_obj[indivial_i,:] = [ 16. 7. 98. 105.]
422 cord_individual_obj[indivial_i,:] = [17. 8. 49. 57.]
423 cord_individual_obj[indivial_i,:] = [ 18. 7. 195. 202.]
424 cord_individual_obj[indivial_i,:] = [ 19. 9. 108. 117.]
425 cord_individual_obj[indivial_i,:] = [ 20. 7. 142. 149.]
426 cord_individual_obj[indivial_i,:] = [ 21. 9. 135. 144.]
427 cord_individual_obj[indivial_i,:] = [22. 9. 64. 73.]
428 cord_individual_obj[indivial_i,:] = [ 23. 8. 116. 124.]
429 cord_individual_obj[indivial_i,:] = [24. 7. 88. 95.]
430
431 min(cord_individual_obj[:,3]) = 57.0
432 histol_G_best_iter[iter,3] = 57.0
433 Begin iteration:
434
435 iter = 13
436 cord_individual_obj[indivial_i,:] = [ 0. 10. 117. 127.]
437 cord_individual_obj[indivial_i,:] = [ 1. 8. 107. 115.]
438 cord_individual_obj[indivial_i,:] = [ 2. 8. 139. 147.]
439 cord_individual_obj[indivial_i,:] = [ 3. 8. 145. 153.]
440 cord_individual_obj[indivial_i,:] = [ 4. 9. 124. 133.]
441 cord_individual_obj[indivial_i,:] = [ 5. 8. 87. 95.]
442 cord_individual_obj[indivial_i,:] = [ 6. 8. 220. 228.]
443 cord_individual_obj[indivial_i,:] = [ 7. 11. 101. 112.]
444 cord_individual_obj[indivial_i,:] = [ 8. 7. 102. 109.]
445 cord_individual_obj[indivial_i,:] = [ 9. 7. 111. 118.]
446 cord_individual_obj[indivial_i,:] = [10. 9. 129. 138.]
447 cord_individual_obj[indivial_i,:] = [11. 10. 131. 141.]
448 cord_individual_obj[indivial_i,:] = [12. 8. 167. 175.]
449 cord_individual_obj[indivial_i,:] = [13. 12. 156. 168.]
450 cord_individual_obj[indivial_i,:] = [14. 7. 148. 155.]
451 cord_individual_obj[indivial_i,:] = [15. 8. 104. 112.]
452 cord_individual_obj[indivial_i,:] = [16. 8. 115. 123.]
453 cord_individual_obj[indivial_i,:] = [17. 6. 104. 110.]
454 cord_individual_obj[indivial_i,:] = [18. 8. 49. 57.]
455 cord_individual_obj[indivial_i,:] = [19. 8. 140. 148.]
456 cord_individual_obj[indivial_i,:] = [20. 8. 124. 132.]
457 cord_individual_obj[indivial_i,:] = [21. 7. 129. 136.]
458 cord_individual_obj[indivial_i,:] = [22. 8. 115. 123.]
459 cord_individual_obj[indivial_i,:] = [23. 8. 149. 157.]
460 cord_individual_obj[indivial_i,:] = [24. 7. 118. 125.]
461
462 min(cord_individual_obj[:,3]) = 57.0
463 histol_G_best_iter[iter,3] = 57.0
464 Begin iteration:
465
466 iter = 14
467 cord_individual_obj[indivial_i,:] = [ 0. 9. 76. 85.]
468 cord_individual_obj[indivial_i,:] = [ 1. 9. 117. 126.]
469 cord_individual_obj[indivial_i,:] = [ 2. 9. 89. 98.]
470 cord_individual_obj[indivial_i,:] = [ 3. 8. 115. 123.]
471 cord_individual_obj[indivial_i,:] = [ 4. 11. 114. 125.]
472 cord_individual_obj[indivial_i,:] = [ 5. 9. 78. 87.]
473 cord_individual_obj[indivial_i,:] = [ 6. 8. 49. 57.]
474 cord_individual_obj[indivial_i,:] = [ 7. 10. 111. 121.]
475 cord_individual_obj[indivial_i,:] = [ 8. 9. 131. 140.]
476 cord_individual_obj[indivial_i,:] = [ 9. 9. 82. 91.]
477 cord_individual_obj[indivial_i,:] = [10. 7. 130. 137.]
478 cord_individual_obj[indivial_i,:] = [11. 10. 139. 149.]
479 cord_individual_obj[indivial_i,:] = [12. 11. 98. 109.]
480 cord_individual_obj[indivial_i,:] = [13. 10. 86. 96.]
481 cord_individual_obj[indivial_i,:] = [14. 8. 123. 131.]
482 cord_individual_obj[indivial_i,:] = [15. 9. 87. 96.]
483 cord_individual_obj[indivial_i,:] = [16. 8. 124. 132.]
484 cord_individual_obj[indivial_i,:] = [17. 9. 124. 133.]
485 cord_individual_obj[indivial_i,:] = [18. 7. 112. 119.]
486 cord_individual_obj[indivial_i,:] = [19. 8. 163. 171.]
487 cord_individual_obj[indivial_i,:] = [20. 9. 83. 92.]
488 cord_individual_obj[indivial_i,:] = [21. 12. 79. 91.]
489 cord_individual_obj[indivial_i,:] = [22. 8. 124. 132.]
490 cord_individual_obj[indivial_i,:] = [23. 10. 139. 149.]
491 cord_individual_obj[indivial_i,:] = [24. 7. 100. 107.]
492
493 min(cord_individual_obj[:,3]) = 57.0
494 histol_G_best_iter[iter,3] = 57.0
495 Begin iteration:
496
497 iter = 15
498 cord_individual_obj[indivial_i,:] = [ 0. 9. 147. 156.]
499 cord_individual_obj[indivial_i,:] = [ 1. 11. 142. 153.]

```

```

500 cord_individual_obj[indivial_i,:] = [ 2. 9. 69. 78.]
501 cord_individual_obj[indivial_i,:] = [ 3. 9. 104. 113.]
502 cord_individual_obj[indivial_i,:] = [ 4. 9. 147. 156.]
503 cord_individual_obj[indivial_i,:] = [ 5. 9. 78. 87.]
504 cord_individual_obj[indivial_i,:] = [ 6. 7. 140. 147.]
505 cord_individual_obj[indivial_i,:] = [ 7. 8. 117. 125.]
506 cord_individual_obj[indivial_i,:] = [ 8. 8. 134. 142.]
507 cord_individual_obj[indivial_i,:] = [ 9. 9. 142. 151.]
508 cord_individual_obj[indivial_i,:] = [ 10. 10. 102. 112.]
509 cord_individual_obj[indivial_i,:] = [ 11. 9. 107. 116.]
510 cord_individual_obj[indivial_i,:] = [ 12. 9. 192. 201.]
511 cord_individual_obj[indivial_i,:] = [ 13. 7. 111. 118.]
512 cord_individual_obj[indivial_i,:] = [ 14. 7. 112. 119.]
513 cord_individual_obj[indivial_i,:] = [ 15. 7. 123. 130.]
514 cord_individual_obj[indivial_i,:] = [ 16. 8. 119. 127.]
515 cord_individual_obj[indivial_i,:] = [ 17. 7. 68. 75.]
516 cord_individual_obj[indivial_i,:] = [ 18. 11. 85. 96.]
517 cord_individual_obj[indivial_i,:] = [ 19. 8. 49. 57.]
518 cord_individual_obj[indivial_i,:] = [ 20. 9. 82. 91.]
519 cord_individual_obj[indivial_i,:] = [ 21. 7. 139. 146.]
520 cord_individual_obj[indivial_i,:] = [ 22. 10. 165. 175.]
521 cord_individual_obj[indivial_i,:] = [ 23. 9. 127. 136.]
522 cord_individual_obj[indivial_i,:] = [ 24. 8. 91. 99.]
523
524 min(cord_individual_obj[:, 3]) = 57.0
525 histol_G_best_iter[iter, 3] = 57.0
526 Begin iteration:
527
528 iter = 16
529 cord_individual_obj[indivial_i,:] = [ 0. 8. 116. 124.]
530 cord_individual_obj[indivial_i,:] = [ 1. 11. 104. 115.]
531 cord_individual_obj[indivial_i,:] = [ 2. 10. 147. 157.]
532 cord_individual_obj[indivial_i,:] = [ 3. 10. 122. 132.]
533 cord_individual_obj[indivial_i,:] = [ 4. 8. 98. 106.]
534 cord_individual_obj[indivial_i,:] = [ 5. 10. 105. 115.]
535 cord_individual_obj[indivial_i,:] = [ 6. 8. 133. 141.]
536 cord_individual_obj[indivial_i,:] = [ 7. 8. 134. 142.]
537 cord_individual_obj[indivial_i,:] = [ 8. 9. 204. 213.]
538 cord_individual_obj[indivial_i,:] = [ 9. 9. 185. 194.]
539 cord_individual_obj[indivial_i,:] = [ 10. 8. 98. 106.]
540 cord_individual_obj[indivial_i,:] = [ 11. 10. 162. 172.]
541 cord_individual_obj[indivial_i,:] = [ 12. 8. 49. 57.]
542 cord_individual_obj[indivial_i,:] = [ 13. 9. 145. 154.]
543 cord_individual_obj[indivial_i,:] = [ 14. 10. 160. 170.]
544 cord_individual_obj[indivial_i,:] = [ 15. 8. 154. 162.]
545 cord_individual_obj[indivial_i,:] = [ 16. 10. 108. 118.]
546 cord_individual_obj[indivial_i,:] = [ 17. 7. 92. 99.]
547 cord_individual_obj[indivial_i,:] = [ 18. 9. 91. 100.]
548 cord_individual_obj[indivial_i,:] = [ 19. 7. 130. 137.]
549 cord_individual_obj[indivial_i,:] = [ 20. 9. 86. 95.]
550 cord_individual_obj[indivial_i,:] = [ 21. 9. 150. 159.]
551 cord_individual_obj[indivial_i,:] = [ 22. 9. 140. 149.]
552 cord_individual_obj[indivial_i,:] = [ 23. 7. 171. 178.]
553 cord_individual_obj[indivial_i,:] = [ 24. 8. 168. 176.]
554
555 min(cord_individual_obj[:, 3]) = 57.0
556 histol_G_best_iter[iter, 3] = 57.0
557 Begin iteration:
558
559 iter = 17
560 cord_individual_obj[indivial_i,:] = [ 0. 8. 137. 145.]
561 cord_individual_obj[indivial_i,:] = [ 1. 10. 141. 151.]
562 cord_individual_obj[indivial_i,:] = [ 2. 8. 138. 146.]
563 cord_individual_obj[indivial_i,:] = [ 3. 10. 172. 182.]
564 cord_individual_obj[indivial_i,:] = [ 4. 10. 118. 128.]
565 cord_individual_obj[indivial_i,:] = [ 5. 8. 97. 105.]
566 cord_individual_obj[indivial_i,:] = [ 6. 7. 148. 155.]
567 cord_individual_obj[indivial_i,:] = [ 7. 7. 97. 104.]
568 cord_individual_obj[indivial_i,:] = [ 8. 8. 49. 57.]
569 cord_individual_obj[indivial_i,:] = [ 9. 11. 171. 182.]
570 cord_individual_obj[indivial_i,:] = [ 10. 10. 145. 155.]
571 cord_individual_obj[indivial_i,:] = [ 11. 9. 180. 189.]
572 cord_individual_obj[indivial_i,:] = [ 12. 9. 116. 125.]
573 cord_individual_obj[indivial_i,:] = [ 13. 8. 124. 132.]
574 cord_individual_obj[indivial_i,:] = [ 14. 8. 140. 148.]
575 cord_individual_obj[indivial_i,:] = [ 15. 8. 153. 161.]
576 cord_individual_obj[indivial_i,:] = [ 16. 8. 144. 152.]
577 cord_individual_obj[indivial_i,:] = [ 17. 8. 117. 125.]
578 cord_individual_obj[indivial_i,:] = [ 18. 9. 114. 123.]
579 cord_individual_obj[indivial_i,:] = [ 19. 7. 118. 125.]
580 cord_individual_obj[indivial_i,:] = [ 20. 10. 120. 130.]
581 cord_individual_obj[indivial_i,:] = [ 21. 6. 152. 158.]
582 cord_individual_obj[indivial_i,:] = [ 22. 8. 137. 145.]
583 cord_individual_obj[indivial_i,:] = [ 23. 9. 136. 145.]

```

unknown

```
584     cord_individual_obj[indivial_i, :] = [ 24.  7. 100. 107.]
585
586     min(cord_individual_obj[:, 3]) = 57.0
587     historl_G_best_iter[iter, 3] = 57.0
588 Begin iteration:
589
590 iter = 18
591     cord_individual_obj[indivial_i, :] = [ 0.  9. 95. 104.]
592     cord_individual_obj[indivial_i, :] = [ 1.  8. 132. 140.]
593     cord_individual_obj[indivial_i, :] = [ 2. 10. 124. 134.]
594     cord_individual_obj[indivial_i, :] = [ 3. 10. 79. 89.]
595     cord_individual_obj[indivial_i, :] = [ 4. 10. 165. 175.]
596     cord_individual_obj[indivial_i, :] = [ 5. 11. 245. 256.]
597     cord_individual_obj[indivial_i, :] = [ 6. 9. 88. 97.]
598     cord_individual_obj[indivial_i, :] = [ 7. 8. 111. 119.]
599     cord_individual_obj[indivial_i, :] = [ 8. 8. 108. 116.]
600     cord_individual_obj[indivial_i, :] = [ 9. 8. 104. 112.]
601     cord_individual_obj[indivial_i, :] = [10. 7. 54. 61.]
602     cord_individual_obj[indivial_i, :] = [11. 8. 49. 57.]
603     cord_individual_obj[indivial_i, :] = [12. 13. 128. 141.]
604     cord_individual_obj[indivial_i, :] = [13. 9. 71. 80.]
605     cord_individual_obj[indivial_i, :] = [14. 9. 108. 117.]
606     cord_individual_obj[indivial_i, :] = [15. 8. 145. 153.]
607     cord_individual_obj[indivial_i, :] = [16. 10. 101. 111.]
608     cord_individual_obj[indivial_i, :] = [17. 7. 106. 113.]
609     cord_individual_obj[indivial_i, :] = [18. 9. 88. 97.]
610     cord_individual_obj[indivial_i, :] = [19. 8. 93. 101.]
611     cord_individual_obj[indivial_i, :] = [20. 10. 83. 93.]
612     cord_individual_obj[indivial_i, :] = [21. 8. 128. 136.]
613     cord_individual_obj[indivial_i, :] = [22. 10. 105. 115.]
614     cord_individual_obj[indivial_i, :] = [23. 11. 93. 104.]
615     cord_individual_obj[indivial_i, :] = [24. 8. 87. 95.]
616
617     min(cord_individual_obj[:, 3]) = 57.0
618     historl_G_best_iter[iter, 3] = 57.0
619 Begin iteration:
620
621 iter = 19
622     cord_individual_obj[indivial_i, :] = [ 0.  8. 163. 171.]
623     cord_individual_obj[indivial_i, :] = [ 1. 10. 117. 127.]
624     cord_individual_obj[indivial_i, :] = [ 2. 7. 144. 151.]
625     cord_individual_obj[indivial_i, :] = [ 3. 9. 123. 132.]
626     cord_individual_obj[indivial_i, :] = [ 4. 10. 171. 181.]
627     cord_individual_obj[indivial_i, :] = [ 5. 8. 49. 57.]
628     cord_individual_obj[indivial_i, :] = [ 6. 7. 118. 125.]
629     cord_individual_obj[indivial_i, :] = [ 7. 6. 131. 137.]
630     cord_individual_obj[indivial_i, :] = [ 8. 10. 114. 124.]
631     cord_individual_obj[indivial_i, :] = [ 9. 7. 126. 133.]
632     cord_individual_obj[indivial_i, :] = [10. 9. 150. 159.]
633     cord_individual_obj[indivial_i, :] = [11. 10. 155. 165.]
634     cord_individual_obj[indivial_i, :] = [12. 10. 88. 98.]
635     cord_individual_obj[indivial_i, :] = [13. 10. 145. 155.]
636     cord_individual_obj[indivial_i, :] = [14. 10. 123. 133.]
637     cord_individual_obj[indivial_i, :] = [15. 9. 131. 140.]
638     cord_individual_obj[indivial_i, :] = [16. 8. 51. 59.]
639     cord_individual_obj[indivial_i, :] = [17. 8. 121. 129.]
640     cord_individual_obj[indivial_i, :] = [18. 8. 176. 184.]
641     cord_individual_obj[indivial_i, :] = [19. 9. 185. 194.]
642     cord_individual_obj[indivial_i, :] = [20. 9. 63. 72.]
643     cord_individual_obj[indivial_i, :] = [21. 7. 99. 106.]
644     cord_individual_obj[indivial_i, :] = [22. 9. 144. 153.]
645     cord_individual_obj[indivial_i, :] = [23. 10. 111. 121.]
646     cord_individual_obj[indivial_i, :] = [24. 9. 158. 167.]
647
648     min(cord_individual_obj[:, 3]) = 57.0
649     historl_G_best_iter[iter, 3] = 57.0
650 Begin iteration:
651
652 iter = 20
653     cord_individual_obj[indivial_i, :] = [ 0.  9. 101. 110.]
654     cord_individual_obj[indivial_i, :] = [ 1.  9. 140. 149.]
655     cord_individual_obj[indivial_i, :] = [ 2. 8. 92. 100.]
656     cord_individual_obj[indivial_i, :] = [ 3. 9. 119. 128.]
657     cord_individual_obj[indivial_i, :] = [ 4. 8. 127. 135.]
658     cord_individual_obj[indivial_i, :] = [ 5. 8. 180. 188.]
659     cord_individual_obj[indivial_i, :] = [ 6. 7. 124. 131.]
660     cord_individual_obj[indivial_i, :] = [ 7. 8. 97. 105.]
661     cord_individual_obj[indivial_i, :] = [ 8. 8. 144. 152.]
662     cord_individual_obj[indivial_i, :] = [ 9. 9. 124. 133.]
663     cord_individual_obj[indivial_i, :] = [10. 9. 80. 89.]
664     cord_individual_obj[indivial_i, :] = [11. 9. 113. 122.]
665     cord_individual_obj[indivial_i, :] = [12. 9. 68. 77.]
666     cord_individual_obj[indivial_i, :] = [13. 8. 118. 126.]
667     cord_individual_obj[indivial_i, :] = [14. 8. 88. 96.]
```

```

668 cord_individual_obj[indivial_i,:] = [ 15. 8. 119. 127.]
669 cord_individual_obj[indivial_i,:] = [ 16. 7. 155. 162.]
670 cord_individual_obj[indivial_i,:] = [ 17. 7. 144. 151.]
671 cord_individual_obj[indivial_i,:] = [ 18. 7. 123. 130.]
672 cord_individual_obj[indivial_i,:] = [19. 8. 49. 57.]
673 cord_individual_obj[indivial_i,:] = [20. 8. 87. 95.]
674 cord_individual_obj[indivial_i,:] = [21. 7. 46. 53.]
675 cord_individual_obj[indivial_i,:] = [ 22. 9. 99. 108.]
676 cord_individual_obj[indivial_i,:] = [ 23. 10. 123. 133.]
677 cord_individual_obj[indivial_i,:] = [ 24. 9. 104. 113.]
678
679 min(cord_individual_obj[:, 3]) = 53.0
680 historl_G_best_iter[iter, 3] = 53.0
681 Iteration calculate over
682
683
684
685
686 All item are in Bin and:
687 Bin area = 1080
688 Real_area = 180.0
689 Proportion_of_area = 0.1666666666666666
690 BEST_CHROM =
691 berth: [ 2. 16. 3. 13. 24. 24. 22.5 5.5 9.5 10. 18. 23.5 7.5 8.5]
692 time: [0. 3. 4. 0. 3. 2. 5. 0. 4. 5. 0. 0. 3. 0.]
693 num_QC: [2. 4. 2. 3. 4. 5. 3. 2. 4. 4. 3. 4. 5. 3.]
694 Objective function values and some other indicators:
695 Obj0 = 7.00 Obj1 = 46.00 Obj0 + Obj1 = 53.00
696 Total movement of crane: 8.00
697 Total waiting time in berth position: 29.00
698 Total index of q during berthing: 963.00
699 Specific arrangement for each vessel:
700 V_id: 0 li: 4.0 xi: 2.0 bow of i: 0.0 tail of i: 4.0 gama_i0: 0.0 gama_i1: 3.0
    work load gap_i: 0 gama_i1 + 1: 4.0 gama_i1 - gama_i0: 3.0 duration_time_i: 4.0 demand_i: 160.0 work load_i:
701 V_id: 1 li: 6.0 xi: 16.0 bow of i: 13.0 tail of i: 19.0 gama_i0: 3.0 gama_i1: 4
    .0 load_i: 120.0 gama_i1 + 1: 5.0 gama_i1 - gama_i0: 1.0 duration_time_i: 2.0 demand_i: 120.0 work
702 V_id: 2 li: 6.0 xi: 3.0 bow of i: 0.0 tail of i: 6.0 gama_i0: 4.0 gama_i1: 7.0
    .0 load_i: 140.0 gama_i1 + 1: 8.0 gama_i1 - gama_i0: 3.0 duration_time_i: 4.0 demand_i: 140.0 work load_i:
703 V_id: 3 li: 6.0 xi: 13.0 bow of i: 10.0 tail of i: 16.0 gama_i0: 0.0 gama_i1: 2
    .0 load_i: 160.0 gama_i1 + 1: 3.0 gama_i1 - gama_i0: 2.0 duration_time_i: 3.0 demand_i: 160.0 work
704 V_id: 4 li: 8.0 xi: 24.0 bow of i: 20.0 tail of i: 28.0 gama_i0: 3.0 gama_i1: 4
    .0 load_i: 160.0 gama_i1 + 1: 5.0 gama_i1 - gama_i0: 1.0 duration_time_i: 2.0 demand_i: 160.0 work
705 V_id: 5 li: 8.0 xi: 24.0 bow of i: 20.0 tail of i: 28.0 gama_i0: 2.0 gama_i1: 2
    .0 load_i: 60.0 gama_i1 + 1: 3.0 gama_i1 - gama_i0: 0.0 duration_time_i: 1.0 demand_i: 60.0 work
706 V_id: 6 li: 7.0 xi: 22.5 bow of i: 19.0 tail of i: 26.0 gama_i0: 5.0 gama_i1: 7
    .0 load_i: 140.0 gama_i1 + 1: 8.0 gama_i1 - gama_i0: 2.0 duration_time_i: 3.0 demand_i: 140.0 work
707 V_id: 7 li: 3.0 xi: 5.5 bow of i: 4.0 tail of i: 7.0 gama_i0: 0.0 gama_i1: 2.0
    .0 load_i: 120.0 gama_i1 + 1: 3.0 gama_i1 - gama_i0: 2.0 duration_time_i: 3.0 demand_i: 120.0 work load_i:
708 V_id: 8 li: 7.0 xi: 9.5 bow of i: 6.0 tail of i: 13.0 gama_i0: 4.0 gama_i1: 4.0
    .0 load_i: 60.0 gama_i1 + 1: 5.0 gama_i1 - gama_i0: 0.0 duration_time_i: 1.0 demand_i: 60.0 work load_i:
709 V_id: 9 li: 8.0 xi: 10.0 bow of i: 6.0 tail of i: 14.0 gama_i0: 5.0 gama_i1: 6
    .0 load_i: 140.0 gama_i1 + 1: 7.0 gama_i1 - gama_i0: 1.0 duration_time_i: 2.0 demand_i: 140.0 work
710 V_id: 10 li: 4.0 xi: 18.0 bow of i: 16.0 tail of i: 20.0 gama_i0: 0.0 gama_i1: 1
    : 2.0 load_i: 160.0 gama_i1 + 1: 3.0 gama_i1 - gama_i0: 2.0 duration_time_i: 3.0 demand_i: 160.0 work
711 V_id: 11 li: 7.0 xi: 23.5 bow of i: 20.0 tail of i: 27.0 gama_i0: 0.0 gama_i1: 1
    : 1.0 load_i: 120.0 gama_i1 + 1: 2.0 gama_i1 - gama_i0: 1.0 duration_time_i: 2.0 demand_i: 120.0 work
712 V_id: 12 li: 7.0 xi: 7.5 bow of i: 4.0 tail of i: 11.0 gama_i0: 3.0 gama_i1: 3
    .0 load_i: 100.0 gama_i1 + 1: 4.0 gama_i1 - gama_i0: 0.0 duration_time_i: 1.0 demand_i: 100.0 work
713 V_id: 13 li: 3.0 xi: 8.5 bow of i: 7.0 tail of i: 10.0 gama_i0: 0.0 gama_i1: 1
    .0 load_i: 80.0 gama_i1 + 1: 2.0 gama_i1 - gama_i0: 1.0 duration_time_i: 2.0 demand_i: 80.0 work
714
715 Algorithm finished and the total CPU time: 368 s
716 End
717

```