

unknown

```

80 cord_individual_obj[indivial_i,:] = [16. 4. 69. 73.]
81 cord_individual_obj[indivial_i,:] = [17. 5. 77. 82.]
82 cord_individual_obj[indivial_i,:] = [18. 5. 27. 32.]
83 cord_individual_obj[indivial_i,:] = [19. 6. 30. 36.]
84 cord_individual_obj[indivial_i,:] = [20. 6. 82. 88.]
85 cord_individual_obj[indivial_i,:] = [21. 6. 26. 32.]
86 cord_individual_obj[indivial_i,:] = [22. 4. 28. 32.]
87 cord_individual_obj[indivial_i,:] = [23. 4. 40. 44.]
88 cord_individual_obj[indivial_i,:] = [24. 5. 29. 34.]
89
90 min(cord_individual_obj[:,3]) = 16.0
91 historl_G_best_iter[iter, 3] = 16.0
92 Begin iteration:
93
94 iter = 2
95 cord_individual_obj[indivial_i,:] = [ 0. 5. 60. 65.]
96 cord_individual_obj[indivial_i,:] = [ 1. 4. 116. 120.]
97 cord_individual_obj[indivial_i,:] = [ 2. 4. 131. 135.]
98 cord_individual_obj[indivial_i,:] = [ 3. 4. 102. 106.]
99 cord_individual_obj[indivial_i,:] = [ 4. 5. 41. 46.]
100 cord_individual_obj[indivial_i,:] = [ 5. 5. 133. 138.]
101 cord_individual_obj[indivial_i,:] = [ 6. 5. 60. 65.]
102 cord_individual_obj[indivial_i,:] = [ 7. 3. 127. 130.]
103 cord_individual_obj[indivial_i,:] = [ 8. 5. 41. 46.]
104 cord_individual_obj[indivial_i,:] = [ 9. 5. 54. 59.]
105 cord_individual_obj[indivial_i,:] = [10. 6. 26. 32.]
106 cord_individual_obj[indivial_i,:] = [11. 4. 89. 93.]
107 cord_individual_obj[indivial_i,:] = [12. 4. 49. 53.]
108 cord_individual_obj[indivial_i,:] = [13. 6. 67. 73.]
109 cord_individual_obj[indivial_i,:] = [14. 3. 77. 80.]
110 cord_individual_obj[indivial_i,:] = [15. 3. 51. 54.]
111 cord_individual_obj[indivial_i,:] = [16. 6. 32. 38.]
112 cord_individual_obj[indivial_i,:] = [17. 4. 105. 109.]
113 cord_individual_obj[indivial_i,:] = [18. 4. 66. 70.]
114 cord_individual_obj[indivial_i,:] = [19. 4. 96. 100.]
115 cord_individual_obj[indivial_i,:] = [20. 5. 11. 16.]
116 cord_individual_obj[indivial_i,:] = [21. 4. 82. 86.]
117 cord_individual_obj[indivial_i,:] = [22. 5. 20. 25.]
118 cord_individual_obj[indivial_i,:] = [23. 4. 11. 15.]
119 cord_individual_obj[indivial_i,:] = [24. 5. 39. 44.]
120
121 min(cord_individual_obj[:,3]) = 15.0
122 historl_G_best_iter[iter, 3] = 15.0
123 Begin iteration:
124
125 iter = 3
126 cord_individual_obj[indivial_i,:] = [ 0. 5. 88. 93.]
127 cord_individual_obj[indivial_i,:] = [ 1. 6. 54. 60.]
128 cord_individual_obj[indivial_i,:] = [ 2. 6. 15. 21.]
129 cord_individual_obj[indivial_i,:] = [ 3. 5. 101. 106.]
130 cord_individual_obj[indivial_i,:] = [ 4. 4. 38. 42.]
131 cord_individual_obj[indivial_i,:] = [ 5. 4. 11. 15.]
132 cord_individual_obj[indivial_i,:] = [ 6. 5. 118. 123.]
133 cord_individual_obj[indivial_i,:] = [ 7. 5. 71. 76.]
134 cord_individual_obj[indivial_i,:] = [ 8. 4. 69. 73.]
135 cord_individual_obj[indivial_i,:] = [ 9. 4. 119. 123.]
136 cord_individual_obj[indivial_i,:] = [10. 6. 72. 78.]
137 cord_individual_obj[indivial_i,:] = [11. 4. 40. 44.]
138 cord_individual_obj[indivial_i,:] = [12. 3. 32. 35.]
139 cord_individual_obj[indivial_i,:] = [13. 6. 72. 78.]
140 cord_individual_obj[indivial_i,:] = [14. 4. 68. 72.]
141 cord_individual_obj[indivial_i,:] = [15. 5. 78. 83.]
142 cord_individual_obj[indivial_i,:] = [16. 4. 35. 39.]
143 cord_individual_obj[indivial_i,:] = [17. 5. 95. 100.]
144 cord_individual_obj[indivial_i,:] = [18. 5. 81. 86.]
145 cord_individual_obj[indivial_i,:] = [19. 5. 67. 72.]
146 cord_individual_obj[indivial_i,:] = [20. 4. 63. 67.]
147 cord_individual_obj[indivial_i,:] = [21. 5. 16. 21.]
148 cord_individual_obj[indivial_i,:] = [22. 4. 82. 86.]
149 cord_individual_obj[indivial_i,:] = [23. 4. 69. 73.]
150 cord_individual_obj[indivial_i,:] = [24. 4. 119. 123.]
151
152 min(cord_individual_obj[:,3]) = 15.0
153 historl_G_best_iter[iter, 3] = 15.0
154 Begin iteration:
155
156 iter = 4
157 cord_individual_obj[indivial_i,:] = [ 0. 6. 22. 28.]
158 cord_individual_obj[indivial_i,:] = [ 1. 4. 21. 25.]
159 cord_individual_obj[indivial_i,:] = [ 2. 4. 110. 114.]
160 cord_individual_obj[indivial_i,:] = [ 3. 4. 101. 105.]
161 cord_individual_obj[indivial_i,:] = [ 4. 4. 34. 38.]
162 cord_individual_obj[indivial_i,:] = [ 5. 5. 63. 68.]
163 cord_individual_obj[indivial_i,:] = [ 6. 4. 11. 15.]

```

```

164 cord_individual_obj[indivial_i,:] = [ 7. 5. 18. 23.]
165 cord_individual_obj[indivial_i,:] = [ 8. 4. 51. 55.]
166 cord_individual_obj[indivial_i,:] = [ 9. 5. 27. 32.]
167 cord_individual_obj[indivial_i,:] = [10. 5. 53. 58.]
168 cord_individual_obj[indivial_i,:] = [11. 4. 69. 73.]
169 cord_individual_obj[indivial_i,:] = [12. 6. 55. 61.]
170 cord_individual_obj[indivial_i,:] = [13. 4. 59. 63.]
171 cord_individual_obj[indivial_i,:] = [14. 4. 69. 73.]
172 cord_individual_obj[indivial_i,:] = [15. 4. 69. 73.]
173 cord_individual_obj[indivial_i,:] = [16. 5. 37. 42.]
174 cord_individual_obj[indivial_i,:] = [17. 5. 97. 102.]
175 cord_individual_obj[indivial_i,:] = [18. 5. 49. 54.]
176 cord_individual_obj[indivial_i,:] = [19. 4. 13. 17.]
177 cord_individual_obj[indivial_i,:] = [20. 5. 71. 76.]
178 cord_individual_obj[indivial_i,:] = [21. 5. 52. 57.]
179 cord_individual_obj[indivial_i,:] = [22. 5. 42. 47.]
180 cord_individual_obj[indivial_i,:] = [23. 5. 101. 106.]
181 cord_individual_obj[indivial_i,:] = [24. 4. 118. 122.]
182
183 min(cord_individual_obj[:,3]) = 15.0
184 historl_G_best_iter[iter,3] = 15.0
185 Begin iteration:
186
187 iter = 5
188 cord_individual_obj[indivial_i,:] = [ 0. 7. 44. 51.]
189 cord_individual_obj[indivial_i,:] = [ 1. 4. 31. 35.]
190 cord_individual_obj[indivial_i,:] = [ 2. 4. 12. 16.]
191 cord_individual_obj[indivial_i,:] = [ 3. 5. 78. 83.]
192 cord_individual_obj[indivial_i,:] = [ 4. 5. 20. 25.]
193 cord_individual_obj[indivial_i,:] = [ 5. 6. 21. 27.]
194 cord_individual_obj[indivial_i,:] = [ 6. 5. 101. 106.]
195 cord_individual_obj[indivial_i,:] = [ 7. 5. 109. 114.]
196 cord_individual_obj[indivial_i,:] = [ 8. 5. 43. 48.]
197 cord_individual_obj[indivial_i,:] = [ 9. 4. 95. 99.]
198 cord_individual_obj[indivial_i,:] = [10. 5. 38. 43.]
199 cord_individual_obj[indivial_i,:] = [11. 5. 51. 56.]
200 cord_individual_obj[indivial_i,:] = [12. 4. 11. 15.]
201 cord_individual_obj[indivial_i,:] = [13. 5. 27. 32.]
202 cord_individual_obj[indivial_i,:] = [14. 4. 97. 101.]
203 cord_individual_obj[indivial_i,:] = [15. 4. 18. 22.]
204 cord_individual_obj[indivial_i,:] = [16. 7. 57. 64.]
205 cord_individual_obj[indivial_i,:] = [17. 4. 33. 37.]
206 cord_individual_obj[indivial_i,:] = [18. 4. 51. 55.]
207 cord_individual_obj[indivial_i,:] = [19. 4. 138. 142.]
208 cord_individual_obj[indivial_i,:] = [20. 5. 109. 114.]
209 cord_individual_obj[indivial_i,:] = [21. 4. 11. 15.]
210 cord_individual_obj[indivial_i,:] = [22. 7. 42. 49.]
211 cord_individual_obj[indivial_i,:] = [23. 4. 34. 38.]
212 cord_individual_obj[indivial_i,:] = [24. 4. 11. 15.]
213
214 min(cord_individual_obj[:,3]) = 15.0
215 historl_G_best_iter[iter,3] = 15.0
216 Begin iteration:
217
218 iter = 6
219 cord_individual_obj[indivial_i,:] = [ 0. 4. 97. 101.]
220 cord_individual_obj[indivial_i,:] = [ 1. 6. 55. 61.]
221 cord_individual_obj[indivial_i,:] = [ 2. 7. 73. 80.]
222 cord_individual_obj[indivial_i,:] = [ 3. 4. 28. 32.]
223 cord_individual_obj[indivial_i,:] = [ 4. 4. 35. 39.]
224 cord_individual_obj[indivial_i,:] = [ 5. 4. 19. 23.]
225 cord_individual_obj[indivial_i,:] = [ 6. 3. 44. 47.]
226 cord_individual_obj[indivial_i,:] = [ 7. 4. 40. 44.]
227 cord_individual_obj[indivial_i,:] = [ 8. 6. 56. 62.]
228 cord_individual_obj[indivial_i,:] = [ 9. 6. 80. 86.]
229 cord_individual_obj[indivial_i,:] = [10. 6. 47. 53.]
230 cord_individual_obj[indivial_i,:] = [11. 4. 61. 65.]
231 cord_individual_obj[indivial_i,:] = [12. 5. 78. 83.]
232 cord_individual_obj[indivial_i,:] = [13. 5. 24. 29.]
233 cord_individual_obj[indivial_i,:] = [14. 3. 75. 78.]
234 cord_individual_obj[indivial_i,:] = [15. 5. 43. 48.]
235 cord_individual_obj[indivial_i,:] = [16. 5. 34. 39.]
236 cord_individual_obj[indivial_i,:] = [17. 3. 49. 52.]
237 cord_individual_obj[indivial_i,:] = [18. 4. 38. 42.]
238 cord_individual_obj[indivial_i,:] = [19. 4. 11. 15.]
239 cord_individual_obj[indivial_i,:] = [20. 4. 64. 68.]
240 cord_individual_obj[indivial_i,:] = [21. 5. 35. 40.]
241 cord_individual_obj[indivial_i,:] = [22. 6. 52. 58.]
242 cord_individual_obj[indivial_i,:] = [23. 4. 56. 60.]
243 cord_individual_obj[indivial_i,:] = [24. 5. 76. 81.]
244
245 min(cord_individual_obj[:,3]) = 15.0
246 historl_G_best_iter[iter,3] = 15.0
247 Begin iteration:

```

```

248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [ 0.  4. 11. 15.]
251 cord_individual_obj[indivial_i, :] = [ 1.  5. 67. 72.]
252 cord_individual_obj[indivial_i, :] = [ 2.  6. 36. 42.]
253 cord_individual_obj[indivial_i, :] = [ 3.  6. 24. 30.]
254 cord_individual_obj[indivial_i, :] = [ 4.  6. 55. 61.]
255 cord_individual_obj[indivial_i, :] = [ 5.  4. 23. 27.]
256 cord_individual_obj[indivial_i, :] = [ 6.  4. 58. 62.]
257 cord_individual_obj[indivial_i, :] = [ 7.  5. 36. 41.]
258 cord_individual_obj[indivial_i, :] = [ 8.  5. 18. 23.]
259 cord_individual_obj[indivial_i, :] = [ 9.  6. 25. 31.]
260 cord_individual_obj[indivial_i, :] = [10.  5. 25. 30.]
261 cord_individual_obj[indivial_i, :] = [11.  5. 35. 40.]
262 cord_individual_obj[indivial_i, :] = [12.  5. 32. 37.]
263 cord_individual_obj[indivial_i, :] = [13.  4. 35. 39.]
264 cord_individual_obj[indivial_i, :] = [14.  5. 75. 80.]
265 cord_individual_obj[indivial_i, :] = [15.  4. 33. 37.]
266 cord_individual_obj[indivial_i, :] = [16.  5. 32. 37.]
267 cord_individual_obj[indivial_i, :] = [17.  4. 63. 67.]
268 cord_individual_obj[indivial_i, :] = [18.  5. 64. 69.]
269 cord_individual_obj[indivial_i, :] = [19.  5. 23. 28.]
270 cord_individual_obj[indivial_i, :] = [20.  5. 36. 41.]
271 cord_individual_obj[indivial_i, :] = [21.  5. 30. 35.]
272 cord_individual_obj[indivial_i, :] = [22.  4. 42. 46.]
273 cord_individual_obj[indivial_i, :] = [23.  4. 36. 40.]
274 cord_individual_obj[indivial_i, :] = [24.  4. 64. 68.]
275

276 min(cord_individual_obj[:, 3]) = 15.0
277 historl_G_best_iter[iter, 3] = 15.0
278 Begin iteration:
279
280 iter = 8
281 cord_individual_obj[indivial_i, :] = [ 0.  5. 25. 30.]
282 cord_individual_obj[indivial_i, :] = [ 1.  4. 112. 116.]
283 cord_individual_obj[indivial_i, :] = [ 2.  6. 60. 66.]
284 cord_individual_obj[indivial_i, :] = [ 3.  5. 36. 41.]
285 cord_individual_obj[indivial_i, :] = [ 4.  6. 42. 48.]
286 cord_individual_obj[indivial_i, :] = [ 5.  5. 14. 19.]
287 cord_individual_obj[indivial_i, :] = [ 6.  3. 20. 23.]
288 cord_individual_obj[indivial_i, :] = [ 7.  5. 21. 26.]
289 cord_individual_obj[indivial_i, :] = [ 8.  6. 25. 31.]
290 cord_individual_obj[indivial_i, :] = [ 9.  4. 92. 96.]
291 cord_individual_obj[indivial_i, :] = [10.  5. 55. 60.]
292 cord_individual_obj[indivial_i, :] = [11.  4. 46. 50.]
293 cord_individual_obj[indivial_i, :] = [12.  6. 17. 23.]
294 cord_individual_obj[indivial_i, :] = [13.  6. 23. 29.]
295 cord_individual_obj[indivial_i, :] = [14.  4. 11. 15.]
296 cord_individual_obj[indivial_i, :] = [15.  5. 48. 53.]
297 cord_individual_obj[indivial_i, :] = [16.  4. 32. 36.]
298 cord_individual_obj[indivial_i, :] = [17.  7. 38. 45.]
299 cord_individual_obj[indivial_i, :] = [18.  4. 31. 35.]
300 cord_individual_obj[indivial_i, :] = [19.  7. 13. 20.]
301 cord_individual_obj[indivial_i, :] = [20.  5. 46. 51.]
302 cord_individual_obj[indivial_i, :] = [21.  6. 65. 71.]
303 cord_individual_obj[indivial_i, :] = [22.  4. 123. 127.]
304 cord_individual_obj[indivial_i, :] = [23.  5. 47. 52.]
305 cord_individual_obj[indivial_i, :] = [24.  7. 92. 99.]
306

307 min(cord_individual_obj[:, 3]) = 15.0
308 historl_G_best_iter[iter, 3] = 15.0
309 Begin iteration:
310
311 iter = 9
312 cord_individual_obj[indivial_i, :] = [ 0.  3. 93. 96.]
313 cord_individual_obj[indivial_i, :] = [ 1.  6. 34. 40.]
314 cord_individual_obj[indivial_i, :] = [ 2.  5. 50. 55.]
315 cord_individual_obj[indivial_i, :] = [ 3.  4. 64. 68.]
316 cord_individual_obj[indivial_i, :] = [ 4.  7. 32. 39.]
317 cord_individual_obj[indivial_i, :] = [ 5.  5. 20. 25.]
318 cord_individual_obj[indivial_i, :] = [ 6.  4. 26. 30.]
319 cord_individual_obj[indivial_i, :] = [ 7.  5. 14. 19.]
320 cord_individual_obj[indivial_i, :] = [ 8.  5. 26. 31.]
321 cord_individual_obj[indivial_i, :] = [ 9.  5. 24. 29.]
322 cord_individual_obj[indivial_i, :] = [10.  5. 36. 41.]
323 cord_individual_obj[indivial_i, :] = [11.  7. 27. 34.]
324 cord_individual_obj[indivial_i, :] = [12.  4. 24. 28.]
325 cord_individual_obj[indivial_i, :] = [13.  6. 36. 42.]
326 cord_individual_obj[indivial_i, :] = [14.  5. 48. 53.]
327 cord_individual_obj[indivial_i, :] = [15.  4. 31. 35.]
328 cord_individual_obj[indivial_i, :] = [16.  4. 13. 17.]
329 cord_individual_obj[indivial_i, :] = [17.  4. 71. 75.]
330 cord_individual_obj[indivial_i, :] = [18.  6. 19. 25.]
331 cord_individual_obj[indivial_i, :] = [19.  5. 15. 20.]

```

```

332 cord_individual_obj[indivial_i, :] = [20. 4. 35. 39.]
333 cord_individual_obj[indivial_i, :] = [21. 5. 75. 80.]
334 cord_individual_obj[indivial_i, :] = [22. 4. 11. 15.]
335 cord_individual_obj[indivial_i, :] = [23. 7. 30. 37.]
336 cord_individual_obj[indivial_i, :] = [24. 6. 16. 22.]
337
338 min(cord_individual_obj[:, 3]) = 15.0
339 histol_G_best_iter[iter, 3] = 15.0
340 Begin iteration:
341
342 iter = 10
343 cord_individual_obj[indivial_i, :] = [ 0. 4. 11. 15.]
344 cord_individual_obj[indivial_i, :] = [ 1. 6. 60. 66.]
345 cord_individual_obj[indivial_i, :] = [ 2. 6. 48. 54.]
346 cord_individual_obj[indivial_i, :] = [ 3. 4. 22. 26.]
347 cord_individual_obj[indivial_i, :] = [ 4. 7. 57. 64.]
348 cord_individual_obj[indivial_i, :] = [ 5. 4. 28. 32.]
349 cord_individual_obj[indivial_i, :] = [ 6. 4. 26. 30.]
350 cord_individual_obj[indivial_i, :] = [ 7. 6. 21. 27.]
351 cord_individual_obj[indivial_i, :] = [ 8. 8. 18. 26.]
352 cord_individual_obj[indivial_i, :] = [ 9. 6. 76. 82.]
353 cord_individual_obj[indivial_i, :] = [10. 5. 61. 66.]
354 cord_individual_obj[indivial_i, :] = [11. 4. 24. 28.]
355 cord_individual_obj[indivial_i, :] = [12. 5. 27. 32.]
356 cord_individual_obj[indivial_i, :] = [13. 5. 52. 57.]
357 cord_individual_obj[indivial_i, :] = [14. 4. 60. 64.]
358 cord_individual_obj[indivial_i, :] = [15. 4. 20. 24.]
359 cord_individual_obj[indivial_i, :] = [16. 5. 37. 42.]
360 cord_individual_obj[indivial_i, :] = [17. 4. 107. 111.]
361 cord_individual_obj[indivial_i, :] = [18. 5. 53. 58.]
362 cord_individual_obj[indivial_i, :] = [19. 6. 13. 19.]
363 cord_individual_obj[indivial_i, :] = [20. 4. 29. 33.]
364 cord_individual_obj[indivial_i, :] = [21. 7. 25. 32.]
365 cord_individual_obj[indivial_i, :] = [22. 5. 46. 51.]
366 cord_individual_obj[indivial_i, :] = [23. 5. 50. 55.]
367 cord_individual_obj[indivial_i, :] = [24. 5. 66. 71.]
368
369 min(cord_individual_obj[:, 3]) = 15.0
370 histol_G_best_iter[iter, 3] = 15.0
371 Begin iteration:
372
373 iter = 11
374 cord_individual_obj[indivial_i, :] = [ 0. 5. 25. 30.]
375 cord_individual_obj[indivial_i, :] = [ 1. 5. 26. 31.]
376 cord_individual_obj[indivial_i, :] = [ 2. 5. 52. 57.]
377 cord_individual_obj[indivial_i, :] = [ 3. 4. 51. 55.]
378 cord_individual_obj[indivial_i, :] = [ 4. 5. 26. 31.]
379 cord_individual_obj[indivial_i, :] = [ 5. 4. 71. 75.]
380 cord_individual_obj[indivial_i, :] = [ 6. 5. 77. 82.]
381 cord_individual_obj[indivial_i, :] = [ 7. 3. 36. 39.]
382 cord_individual_obj[indivial_i, :] = [ 8. 5. 35. 40.]
383 cord_individual_obj[indivial_i, :] = [ 9. 4. 32. 36.]
384 cord_individual_obj[indivial_i, :] = [10. 4. 70. 74.]
385 cord_individual_obj[indivial_i, :] = [11. 4. 33. 37.]
386 cord_individual_obj[indivial_i, :] = [12. 5. 32. 37.]
387 cord_individual_obj[indivial_i, :] = [13. 5. 23. 28.]
388 cord_individual_obj[indivial_i, :] = [14. 4. 51. 55.]
389 cord_individual_obj[indivial_i, :] = [15. 5. 35. 40.]
390 cord_individual_obj[indivial_i, :] = [16. 6. 34. 40.]
391 cord_individual_obj[indivial_i, :] = [17. 4. 11. 15.]
392 cord_individual_obj[indivial_i, :] = [18. 6. 22. 28.]
393 cord_individual_obj[indivial_i, :] = [19. 5. 23. 28.]
394 cord_individual_obj[indivial_i, :] = [20. 4. 23. 27.]
395 cord_individual_obj[indivial_i, :] = [21. 6. 23. 29.]
396 cord_individual_obj[indivial_i, :] = [22. 6. 44. 50.]
397 cord_individual_obj[indivial_i, :] = [23. 4. 40. 44.]
398 cord_individual_obj[indivial_i, :] = [24. 4. 72. 76.]
399
400 min(cord_individual_obj[:, 3]) = 15.0
401 histol_G_best_iter[iter, 3] = 15.0
402 Begin iteration:
403
404 iter = 12
405 cord_individual_obj[indivial_i, :] = [ 0. 3. 93. 96.]
406 cord_individual_obj[indivial_i, :] = [ 1. 4. 39. 43.]
407 cord_individual_obj[indivial_i, :] = [ 2. 4. 57. 61.]
408 cord_individual_obj[indivial_i, :] = [ 3. 5. 30. 35.]
409 cord_individual_obj[indivial_i, :] = [ 4. 7. 35. 42.]
410 cord_individual_obj[indivial_i, :] = [ 5. 5. 14. 19.]
411 cord_individual_obj[indivial_i, :] = [ 6. 4. 11. 15.]
412 cord_individual_obj[indivial_i, :] = [ 7. 5. 10. 15.]
413 cord_individual_obj[indivial_i, :] = [ 8. 8. 27. 35.]
414 cord_individual_obj[indivial_i, :] = [ 9. 4. 38. 42.]
415 cord_individual_obj[indivial_i, :] = [10. 5. 75. 80.]

```

```

416 cord_individual_obj[indivial_i,:] = [11. 4. 27. 31.]
417 cord_individual_obj[indivial_i,:] = [12. 3. 30. 33.]
418 cord_individual_obj[indivial_i,:] = [13. 7. 52. 59.]
419 cord_individual_obj[indivial_i,:] = [14. 4. 60. 64.]
420 cord_individual_obj[indivial_i,:] = [15. 5. 29. 34.]
421 cord_individual_obj[indivial_i,:] = [16. 5. 35. 40.]
422 cord_individual_obj[indivial_i,:] = [17. 4. 50. 54.]
423 cord_individual_obj[indivial_i,:] = [18. 5. 16. 21.]
424 cord_individual_obj[indivial_i,:] = [19. 7. 12. 19.]
425 cord_individual_obj[indivial_i,:] = [20. 5. 49. 54.]
426 cord_individual_obj[indivial_i,:] = [21. 7. 55. 62.]
427 cord_individual_obj[indivial_i,:] = [22. 4. 26. 30.]
428 cord_individual_obj[indivial_i,:] = [23. 5. 26. 31.]
429 cord_individual_obj[indivial_i,:] = [24. 5. 51. 56.]
430
431 min(cord_individual_obj[:,3]) = 15.0
432 histol_G_best_iter[iter,3] = 15.0
433 Begin iteration:
434
435 iter = 13
436 cord_individual_obj[indivial_i,:] = [ 0. 4. 11. 15.]
437 cord_individual_obj[indivial_i,:] = [ 1. 6. 61. 67.]
438 cord_individual_obj[indivial_i,:] = [ 2. 5. 56. 61.]
439 cord_individual_obj[indivial_i,:] = [ 3. 5. 52. 57.]
440 cord_individual_obj[indivial_i,:] = [ 4. 6. 37. 43.]
441 cord_individual_obj[indivial_i,:] = [ 5. 4. 24. 28.]
442 cord_individual_obj[indivial_i,:] = [ 6. 5. 77. 82.]
443 cord_individual_obj[indivial_i,:] = [ 7. 4. 38. 42.]
444 cord_individual_obj[indivial_i,:] = [ 8. 6. 22. 28.]
445 cord_individual_obj[indivial_i,:] = [ 9. 6. 70. 76.]
446 cord_individual_obj[indivial_i,:] = [10. 5. 60. 65.]
447 cord_individual_obj[indivial_i,:] = [11. 4. 32. 36.]
448 cord_individual_obj[indivial_i,:] = [12. 5. 70. 75.]
449 cord_individual_obj[indivial_i,:] = [13. 5. 26. 31.]
450 cord_individual_obj[indivial_i,:] = [14. 5. 51. 56.]
451 cord_individual_obj[indivial_i,:] = [15. 5. 41. 46.]
452 cord_individual_obj[indivial_i,:] = [16. 6. 34. 40.]
453 cord_individual_obj[indivial_i,:] = [17. 4. 50. 54.]
454 cord_individual_obj[indivial_i,:] = [18. 4. 65. 69.]
455 cord_individual_obj[indivial_i,:] = [19. 5. 23. 28.]
456 cord_individual_obj[indivial_i,:] = [20. 5. 91. 96.]
457 cord_individual_obj[indivial_i,:] = [21. 5. 35. 40.]
458 cord_individual_obj[indivial_i,:] = [22. 4. 45. 49.]
459 cord_individual_obj[indivial_i,:] = [23. 4. 56. 60.]
460 cord_individual_obj[indivial_i,:] = [24. 4. 53. 57.]
461
462 min(cord_individual_obj[:,3]) = 15.0
463 histol_G_best_iter[iter,3] = 15.0
464 Begin iteration:
465
466 iter = 14
467 cord_individual_obj[indivial_i,:] = [ 0. 5. 25. 30.]
468 cord_individual_obj[indivial_i,:] = [ 1. 5. 24. 29.]
469 cord_individual_obj[indivial_i,:] = [ 2. 6. 50. 56.]
470 cord_individual_obj[indivial_i,:] = [ 3. 7. 67. 74.]
471 cord_individual_obj[indivial_i,:] = [ 4. 5. 32. 37.]
472 cord_individual_obj[indivial_i,:] = [ 5. 5. 13. 18.]
473 cord_individual_obj[indivial_i,:] = [ 6. 4. 11. 15.]
474 cord_individual_obj[indivial_i,:] = [ 7. 5. 9. 14.]
475 cord_individual_obj[indivial_i,:] = [ 8. 7. 20. 27.]
476 cord_individual_obj[indivial_i,:] = [ 9. 5. 54. 59.]
477 cord_individual_obj[indivial_i,:] = [10. 5. 63. 68.]
478 cord_individual_obj[indivial_i,:] = [11. 4. 26. 30.]
479 cord_individual_obj[indivial_i,:] = [12. 5. 36. 41.]
480 cord_individual_obj[indivial_i,:] = [13. 6. 34. 40.]
481 cord_individual_obj[indivial_i,:] = [14. 4. 60. 64.]
482 cord_individual_obj[indivial_i,:] = [15. 4. 35. 39.]
483 cord_individual_obj[indivial_i,:] = [16. 5. 32. 37.]
484 cord_individual_obj[indivial_i,:] = [17. 4. 65. 69.]
485 cord_individual_obj[indivial_i,:] = [18. 4. 58. 62.]
486 cord_individual_obj[indivial_i,:] = [19. 6. 15. 21.]
487 cord_individual_obj[indivial_i,:] = [20. 4. 11. 15.]
488 cord_individual_obj[indivial_i,:] = [21. 5. 18. 23.]
489 cord_individual_obj[indivial_i,:] = [22. 6. 32. 38.]
490 cord_individual_obj[indivial_i,:] = [23. 5. 37. 42.]
491 cord_individual_obj[indivial_i,:] = [24. 6. 52. 58.]
492
493 min(cord_individual_obj[:,3]) = 14.0
494 histol_G_best_iter[iter,3] = 14.0
495 Begin iteration:
496
497 iter = 15
498 cord_individual_obj[indivial_i,:] = [ 0. 4. 35. 39.]
499 cord_individual_obj[indivial_i,:] = [ 1. 5. 27. 32.]

```

```

500 cord_individual_obj[indivial_i,:] = [ 2. 5. 31. 36.]
501 cord_individual_obj[indivial_i,:] = [ 3. 5. 9. 14.]
502 cord_individual_obj[indivial_i,:] = [ 4. 5. 42. 47.]
503 cord_individual_obj[indivial_i,:] = [ 5. 4. 35. 39.]
504 cord_individual_obj[indivial_i,:] = [ 6. 4. 14. 18.]
505 cord_individual_obj[indivial_i,:] = [ 7. 6. 44. 50.]
506 cord_individual_obj[indivial_i,:] = [ 8. 6. 12. 18.]
507 cord_individual_obj[indivial_i,:] = [ 9. 4. 39. 43.]
508 cord_individual_obj[indivial_i,:] = [10. 6. 38. 44.]
509 cord_individual_obj[indivial_i,:] = [11. 5. 23. 28.]
510 cord_individual_obj[indivial_i,:] = [12. 6. 84. 90.]
511 cord_individual_obj[indivial_i,:] = [13. 7. 26. 33.]
512 cord_individual_obj[indivial_i,:] = [14. 6. 34. 40.]
513 cord_individual_obj[indivial_i,:] = [15. 5. 33. 38.]
514 cord_individual_obj[indivial_i,:] = [16. 5. 22. 27.]
515 cord_individual_obj[indivial_i,:] = [17. 4. 33. 37.]
516 cord_individual_obj[indivial_i,:] = [18. 4. 24. 28.]
517 cord_individual_obj[indivial_i,:] = [19. 5. 53. 58.]
518 cord_individual_obj[indivial_i,:] = [20. 4. 74. 78.]
519 cord_individual_obj[indivial_i,:] = [21. 7. 48. 55.]
520 cord_individual_obj[indivial_i,:] = [22. 5. 48. 53.]
521 cord_individual_obj[indivial_i,:] = [23. 4. 17. 21.]
522 cord_individual_obj[indivial_i,:] = [24. 5. 49. 54.]
523
524 min(cord_individual_obj[:, 3]) = 14.0
525 histol_G_best_iter[iter, 3] = 14.0
526 Begin iteration:
527
528 iter = 16
529 cord_individual_obj[indivial_i,:] = [ 0. 5. 39. 44.]
530 cord_individual_obj[indivial_i,:] = [ 1. 5. 15. 20.]
531 cord_individual_obj[indivial_i,:] = [ 2. 5. 40. 45.]
532 cord_individual_obj[indivial_i,:] = [ 3. 5. 63. 68.]
533 cord_individual_obj[indivial_i,:] = [ 4. 6. 30. 36.]
534 cord_individual_obj[indivial_i,:] = [ 5. 5. 12. 17.]
535 cord_individual_obj[indivial_i,:] = [ 6. 3. 105. 108.]
536 cord_individual_obj[indivial_i,:] = [ 7. 4. 10. 14.]
537 cord_individual_obj[indivial_i,:] = [ 8. 5. 11. 16.]
538 cord_individual_obj[indivial_i,:] = [ 9. 6. 110. 116.]
539 cord_individual_obj[indivial_i,:] = [10. 4. 20. 24.]
540 cord_individual_obj[indivial_i,:] = [11. 6. 40. 46.]
541 cord_individual_obj[indivial_i,:] = [12. 5. 9. 14.]
542 cord_individual_obj[indivial_i,:] = [13. 7. 37. 44.]
543 cord_individual_obj[indivial_i,:] = [14. 4. 34. 38.]
544 cord_individual_obj[indivial_i,:] = [15. 4. 52. 56.]
545 cord_individual_obj[indivial_i,:] = [16. 3. 117. 120.]
546 cord_individual_obj[indivial_i,:] = [17. 4. 97. 101.]
547 cord_individual_obj[indivial_i,:] = [18. 4. 75. 79.]
548 cord_individual_obj[indivial_i,:] = [19. 4. 9. 13.]
549 cord_individual_obj[indivial_i,:] = [20. 4. 46. 50.]
550 cord_individual_obj[indivial_i,:] = [21. 6. 17. 23.]
551 cord_individual_obj[indivial_i,:] = [22. 5. 15. 20.]
552 cord_individual_obj[indivial_i,:] = [23. 4. 46. 50.]
553 cord_individual_obj[indivial_i,:] = [24. 6. 16. 22.]
554
555 min(cord_individual_obj[:, 3]) = 13.0
556 histol_G_best_iter[iter, 3] = 13.0
557 Begin iteration:
558
559 iter = 17
560 cord_individual_obj[indivial_i,:] = [ 0. 5. 22. 27.]
561 cord_individual_obj[indivial_i,:] = [ 1. 5. 12. 17.]
562 cord_individual_obj[indivial_i,:] = [ 2. 5. 36. 41.]
563 cord_individual_obj[indivial_i,:] = [ 3. 5. 54. 59.]
564 cord_individual_obj[indivial_i,:] = [ 4. 5. 13. 18.]
565 cord_individual_obj[indivial_i,:] = [ 5. 5. 10. 15.]
566 cord_individual_obj[indivial_i,:] = [ 6. 4. 22. 26.]
567 cord_individual_obj[indivial_i,:] = [ 7. 6. 24. 30.]
568 cord_individual_obj[indivial_i,:] = [ 8. 6. 24. 30.]
569 cord_individual_obj[indivial_i,:] = [ 9. 8. 19. 27.]
570 cord_individual_obj[indivial_i,:] = [10. 6. 18. 24.]
571 cord_individual_obj[indivial_i,:] = [11. 6. 64. 70.]
572 cord_individual_obj[indivial_i,:] = [12. 7. 11. 18.]
573 cord_individual_obj[indivial_i,:] = [13. 7. 53. 60.]
574 cord_individual_obj[indivial_i,:] = [14. 5. 75. 80.]
575 cord_individual_obj[indivial_i,:] = [15. 6. 76. 82.]
576 cord_individual_obj[indivial_i,:] = [16. 4. 9. 13.]
577 cord_individual_obj[indivial_i,:] = [17. 3. 38. 41.]
578 cord_individual_obj[indivial_i,:] = [18. 4. 32. 36.]
579 cord_individual_obj[indivial_i,:] = [19. 6. 12. 18.]
580 cord_individual_obj[indivial_i,:] = [20. 5. 43. 48.]
581 cord_individual_obj[indivial_i,:] = [21. 7. 76. 83.]
582 cord_individual_obj[indivial_i,:] = [22. 5. 18. 23.]
583 cord_individual_obj[indivial_i,:] = [23. 6. 105. 111.]

```

unknown

```
584     cord_individual_obj[indivial_i, :] = [24. 5. 43. 48.]  
585  
586     min(cord_individual_obj[:, 3]) = 13.0  
587     historl_G_best_iter[iter, 3] = 13.0  
588 Begin iteration:  
589  
590 iter = 18  
591     cord_individual_obj[indivial_i, :] = [ 0. 5. 33. 38.]  
592     cord_individual_obj[indivial_i, :] = [ 1. 4. 67. 71.]  
593     cord_individual_obj[indivial_i, :] = [ 2. 6. 35. 41.]  
594     cord_individual_obj[indivial_i, :] = [ 3. 4. 30. 34.]  
595     cord_individual_obj[indivial_i, :] = [ 4. 7. 33. 40.]  
596     cord_individual_obj[indivial_i, :] = [ 5. 4. 14. 18.]  
597     cord_individual_obj[indivial_i, :] = [ 6. 4. 22. 26.]  
598     cord_individual_obj[indivial_i, :] = [ 7. 7. 24. 31.]  
599     cord_individual_obj[indivial_i, :] = [ 8. 5. 26. 31.]  
600     cord_individual_obj[indivial_i, :] = [ 9. 6. 34. 40.]  
601     cord_individual_obj[indivial_i, :] = [10. 5. 34. 39.]  
602     cord_individual_obj[indivial_i, :] = [11. 6. 18. 24.]  
603     cord_individual_obj[indivial_i, :] = [12. 6. 18. 24.]  
604     cord_individual_obj[indivial_i, :] = [13. 4. 30. 34.]  
605     cord_individual_obj[indivial_i, :] = [14. 4. 33. 37.]  
606     cord_individual_obj[indivial_i, :] = [15. 5. 43. 48.]  
607     cord_individual_obj[indivial_i, :] = [16. 5. 75. 80.]  
608     cord_individual_obj[indivial_i, :] = [17. 5. 29. 34.]  
609     cord_individual_obj[indivial_i, :] = [18. 5. 19. 24.]  
610     cord_individual_obj[indivial_i, :] = [19. 5. 18. 23.]  
611     cord_individual_obj[indivial_i, :] = [20. 5. 44. 49.]  
612     cord_individual_obj[indivial_i, :] = [21. 8. 30. 38.]  
613     cord_individual_obj[indivial_i, :] = [22. 4. 22. 26.]  
614     cord_individual_obj[indivial_i, :] = [23. 4. 9. 13.]  
615     cord_individual_obj[indivial_i, :] = [24. 5. 46. 51.]  
616  
617     min(cord_individual_obj[:, 3]) = 13.0  
618     historl_G_best_iter[iter, 3] = 13.0  
619 Begin iteration:  
620  
621 iter = 19  
622     cord_individual_obj[indivial_i, :] = [ 0. 6. 39. 45.]  
623     cord_individual_obj[indivial_i, :] = [ 1. 4. 24. 28.]  
624     cord_individual_obj[indivial_i, :] = [ 2. 6. 77. 83.]  
625     cord_individual_obj[indivial_i, :] = [ 3. 5. 62. 67.]  
626     cord_individual_obj[indivial_i, :] = [ 4. 5. 114. 119.]  
627     cord_individual_obj[indivial_i, :] = [ 5. 5. 64. 69.]  
628     cord_individual_obj[indivial_i, :] = [ 6. 4. 42. 46.]  
629     cord_individual_obj[indivial_i, :] = [ 7. 6. 44. 50.]  
630     cord_individual_obj[indivial_i, :] = [ 8. 6. 44. 50.]  
631     cord_individual_obj[indivial_i, :] = [ 9. 6. 63. 69.]  
632     cord_individual_obj[indivial_i, :] = [10. 5. 16. 21.]  
633     cord_individual_obj[indivial_i, :] = [11. 6. 14. 20.]  
634     cord_individual_obj[indivial_i, :] = [12. 6. 35. 41.]  
635     cord_individual_obj[indivial_i, :] = [13. 7. 94. 101.]  
636     cord_individual_obj[indivial_i, :] = [14. 5. 63. 68.]  
637     cord_individual_obj[indivial_i, :] = [15. 6. 62. 68.]  
638     cord_individual_obj[indivial_i, :] = [16. 4. 9. 13.]  
639     cord_individual_obj[indivial_i, :] = [17. 5. 80. 85.]  
640     cord_individual_obj[indivial_i, :] = [18. 7. 17. 24.]  
641     cord_individual_obj[indivial_i, :] = [19. 6. 52. 58.]  
642     cord_individual_obj[indivial_i, :] = [20. 6. 62. 68.]  
643     cord_individual_obj[indivial_i, :] = [21. 5. 73. 78.]  
644     cord_individual_obj[indivial_i, :] = [22. 6. 75. 81.]  
645     cord_individual_obj[indivial_i, :] = [23. 4. 49. 53.]  
646     cord_individual_obj[indivial_i, :] = [24. 5. 12. 17.]  
647  
648     min(cord_individual_obj[:, 3]) = 13.0  
649     historl_G_best_iter[iter, 3] = 13.0  
650 Begin iteration:  
651  
652 iter = 20  
653     cord_individual_obj[indivial_i, :] = [ 0. 5. 17. 22.]  
654     cord_individual_obj[indivial_i, :] = [ 1. 3. 21. 24.]  
655     cord_individual_obj[indivial_i, :] = [ 2. 5. 15. 20.]  
656     cord_individual_obj[indivial_i, :] = [ 3. 4. 24. 28.]  
657     cord_individual_obj[indivial_i, :] = [ 4. 4. 9. 13.]  
658     cord_individual_obj[indivial_i, :] = [ 5. 6. 16. 22.]  
659     cord_individual_obj[indivial_i, :] = [ 6. 5. 16. 21.]  
660     cord_individual_obj[indivial_i, :] = [ 7. 6. 31. 37.]  
661     cord_individual_obj[indivial_i, :] = [ 8. 5. 33. 38.]  
662     cord_individual_obj[indivial_i, :] = [ 9. 4. 12. 16.]  
663     cord_individual_obj[indivial_i, :] = [10. 5. 39. 44.]  
664     cord_individual_obj[indivial_i, :] = [11. 5. 10. 15.]  
665     cord_individual_obj[indivial_i, :] = [12. 5. 39. 44.]  
666     cord_individual_obj[indivial_i, :] = [13. 5. 51. 56.]  
667     cord_individual_obj[indivial_i, :] = [14. 3. 36. 39.]
```

```

668 cord_individual_obj[indivial_i, :] = [15. 4. 49. 53.]
669 cord_individual_obj[indivial_i, :] = [16. 5. 75. 80.]
670 cord_individual_obj[indivial_i, :] = [17. 4. 65. 69.]
671 cord_individual_obj[indivial_i, :] = [18. 4. 49. 53.]
672 cord_individual_obj[indivial_i, :] = [19. 6. 13. 19.]
673 cord_individual_obj[indivial_i, :] = [20. 6. 26. 32.]
674 cord_individual_obj[indivial_i, :] = [21. 6. 20. 26.]
675 cord_individual_obj[indivial_i, :] = [22. 4. 78. 82.]
676 cord_individual_obj[indivial_i, :] = [23. 5. 13. 18.]
677 cord_individual_obj[indivial_i, :] = [24. 5. 39. 44.]
678
679 min(cord_individual_obj[:, 3]) = 13.0
680 historl_G_best_iter[iter, 3] = 13.0
681 Iteration calculate over
682
683
684
685
686 All item are in Bin and:
687 Bin area = 1080
688 Real_area = 124.0
689 Proportion_of_area = 0.11481481481481481
690 BEST_CHROM =
691     berth: [ 2.5 7. 11.5 12.5 22. 23. 8. 15. 16.5 2. ]
692     time: [0. 0. 0. 1. 3. 0. 2. 2. 0. 1.]
693     num_QC: [4. 3. 5. 5. 3. 3. 4. 2. 4. 2.]
694 Objective function values and some other indicators:
695 Obj0 = 4.00          Obj1 = 9.00          Obj0 + Obj1 = 13.00
696 Total movement of crane: 0.00
697 Total waiting time in berth position: 9.00
698 Total index of q during berthing: 490.00
699 Specific arrangement for each vessel:
700
    V_id: 0           li: 5.0           xi: 2.5           bow of i: 0.0           tail of i: 5.0           gama_i0: 0.0           gama_i1: 0.0
    .0                 gama_i1 + 1: 1.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
    60.0               work load gap_i: 0
701
    V_id: 1           li: 4.0           xi: 7.0           bow of i: 5.0           tail of i: 9.0           gama_i0: 0.0           gama_i1: 1.0
    .0                 gama_i1 + 1: 2.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
    120.0              work load gap_i: 0
702
    V_id: 2           li: 5.0           xi: 11.5          bow of i: 9.0           tail of i: 14.0          gama_i0: 0.0           gama_i1: 0
    .0                 gama_i1 + 1: 1.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
    load_i: 100.0      work load gap_i: 0
703
    V_id: 3           li: 7.0           xi: 12.5          bow of i: 9.0           tail of i: 16.0          gama_i0: 1.0           gama_i1: 1
    .0                 gama_i1 + 1: 2.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
    load_i: 100.0      work load gap_i: 0
704
    V_id: 4           li: 8.0           xi: 22.0          bow of i: 18.0          tail of i: 26.0          gama_i0: 3.0           gama_i1: 3
    .0                 gama_i1 + 1: 4.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
    load_i: 60.0       work load gap_i: 0
705
    V_id: 5           li: 8.0           xi: 23.0          bow of i: 19.0          tail of i: 27.0          gama_i0: 0.0           gama_i1: 2
    .0                 gama_i1 + 1: 3.0   gama_i1 - gama_i0: 2.0   duration_time_i: 3.0
    load_i: 160.0      work load gap_i: 0
706
    V_id: 6           li: 8.0           xi: 8.0           bow of i: 4.0           tail of i: 12.0          gama_i0: 2.0           gama_i1: 2.0
    .0                 gama_i1 + 1: 3.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
    80.0               work load gap_i: 0
707
    V_id: 7           li: 6.0           xi: 15.0          bow of i: 12.0          tail of i: 18.0          gama_i0: 2.0           gama_i1: 3
    .0                 gama_i1 + 1: 4.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
    load_i: 60.0       work load gap_i: 0
708
    V_id: 8           li: 5.0           xi: 16.5          bow of i: 14.0          tail of i: 19.0          gama_i0: 0.0           gama_i1: 0
    .0                 gama_i1 + 1: 1.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
    load_i: 80.0       work load gap_i: 0
709
    V_id: 9           li: 4.0           xi: 2.0           bow of i: 0.0           tail of i: 4.0           gama_i0: 1.0           gama_i1: 4.0
    .0                 gama_i1 + 1: 5.0   gama_i1 - gama_i0: 3.0   duration_time_i: 4.0
    160.0              work load gap_i: 0
710
711 Algorithm finished and the total CPU time: 261 s
712 End
713

```