

unknown

unknown

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80 min(cord_individual_obj[:, 3]) = 22.0
81 historl_G_best_iter[iter, 3] = 22.0
82 Begin iteration:
83
84 iter = 2
85 cord_individual_obj[indivial_i, :] = [ 0. 6. 8. 14.]
86 cord_individual_obj[indivial_i, :] = [ 1. 4. 18. 22.]
87 cord_individual_obj[indivial_i, :] = [ 2. 4. 18. 22.]
88 cord_individual_obj[indivial_i, :] = [ 3. 6. 8. 14.]
89 cord_individual_obj[indivial_i, :] = [ 4. 4. 18. 22.]
90 cord_individual_obj[indivial_i, :] = [ 5. 6. 8. 14.]
91 cord_individual_obj[indivial_i, :] = [ 6. 4. 18. 22.]
92 cord_individual_obj[indivial_i, :] = [ 7. 6. 8. 14.]
93 cord_individual_obj[indivial_i, :] = [ 8. 4. 18. 22.]
94 cord_individual_obj[indivial_i, :] = [ 9. 6. 8. 14.]
95 cord_individual_obj[indivial_i, :] = [10. 6. 8. 14.]
96 cord_individual_obj[indivial_i, :] = [11. 6. 8. 14.]
97 cord_individual_obj[indivial_i, :] = [12. 4. 18. 22.]
98 cord_individual_obj[indivial_i, :] = [13. 4. 18. 22.]
99 cord_individual_obj[indivial_i, :] = [14. 6. 8. 14.]
100 cord_individual_obj[indivial_i, :] = [15. 6. 8. 14.]
101 cord_individual_obj[indivial_i, :] = [16. 6. 20. 26.]
102 cord_individual_obj[indivial_i, :] = [17. 6. 8. 14.]
103 cord_individual_obj[indivial_i, :] = [18. 6. 8. 14.]
104 cord_individual_obj[indivial_i, :] = [19. 6. 8. 14.]
105
106 min(cord_individual_obj[:, 3]) = 14.0
107 historl_G_best_iter[iter, 3] = 14.0
108 Begin iteration:
109
110 iter = 3
111 cord_individual_obj[indivial_i, :] = [ 0. 5. 124. 129.]
112 cord_individual_obj[indivial_i, :] = [ 1. 6. 8. 14.]
113 cord_individual_obj[indivial_i, :] = [ 2. 6. 8. 14.]
114 cord_individual_obj[indivial_i, :] = [ 3. 5. 34. 39.]
115 cord_individual_obj[indivial_i, :] = [ 4. 6. 8. 14.]
116 cord_individual_obj[indivial_i, :] = [ 5. 5. 88. 93.]
117 cord_individual_obj[indivial_i, :] = [ 6. 6. 8. 14.]
118 cord_individual_obj[indivial_i, :] = [ 7. 4. 88. 92.]
119 cord_individual_obj[indivial_i, :] = [ 8. 6. 8. 14.]
120 cord_individual_obj[indivial_i, :] = [ 9. 4. 88. 92.]
121 cord_individual_obj[indivial_i, :] = [10. 4. 56. 60.]
122 cord_individual_obj[indivial_i, :] = [11. 4. 38. 42.]
123 cord_individual_obj[indivial_i, :] = [12. 6. 8. 14.]
124 cord_individual_obj[indivial_i, :] = [13. 6. 8. 14.]
125 cord_individual_obj[indivial_i, :] = [14. 4. 102. 106.]
126 cord_individual_obj[indivial_i, :] = [15. 5. 60. 65.]
127 cord_individual_obj[indivial_i, :] = [16. 6. 8. 14.]
128 cord_individual_obj[indivial_i, :] = [17. 5. 90. 95.]
129 cord_individual_obj[indivial_i, :] = [18. 5. 54. 59.]
130 cord_individual_obj[indivial_i, :] = [19. 5. 90. 95.]
131
132 min(cord_individual_obj[:, 3]) = 14.0
133 historl_G_best_iter[iter, 3] = 14.0
134 Begin iteration:
135
136 iter = 4
137 cord_individual_obj[indivial_i, :] = [ 0. 6. 8. 14.]
138 cord_individual_obj[indivial_i, :] = [ 1. 6. 8. 14.]
139 cord_individual_obj[indivial_i, :] = [ 2. 6. 18. 24.]
140 cord_individual_obj[indivial_i, :] = [ 3. 6. 8. 14.]
141 cord_individual_obj[indivial_i, :] = [ 4. 6. 18. 24.]
142 cord_individual_obj[indivial_i, :] = [ 5. 5. 54. 59.]
143 cord_individual_obj[indivial_i, :] = [ 6. 6. 8. 14.]
144 cord_individual_obj[indivial_i, :] = [ 7. 4. 70. 74.]
145 cord_individual_obj[indivial_i, :] = [ 8. 6. 8. 14.]
146 cord_individual_obj[indivial_i, :] = [ 9. 4. 108. 112.]
147 cord_individual_obj[indivial_i, :] = [10. 4. 60. 64.]
148 cord_individual_obj[indivial_i, :] = [11. 4. 18. 22.]
149 cord_individual_obj[indivial_i, :] = [12. 6. 8. 14.]
150 cord_individual_obj[indivial_i, :] = [13. 6. 20. 26.]
151 cord_individual_obj[indivial_i, :] = [14. 4. 62. 66.]
152 cord_individual_obj[indivial_i, :] = [15. 4. 30. 34.]
153 cord_individual_obj[indivial_i, :] = [16. 4. 96. 100.]
154 cord_individual_obj[indivial_i, :] = [17. 4. 24. 28.]
155 cord_individual_obj[indivial_i, :] = [18. 4. 120. 124.]
156 cord_individual_obj[indivial_i, :] = [19. 4. 76. 80.]
157
158 min(cord_individual_obj[:, 3]) = 14.0
159 historl_G_best_iter[iter, 3] = 14.0
160 Begin iteration:
161
162 iter = 5
163 cord_individual_obj[indivial_i, :] = [ 0. 5. 54. 59.]
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164 cord_individual_obj[indivial_i,:] = [ 1. 6. 8. 14.]
165 cord_individual_obj[indivial_i,:] = [ 2. 6. 8. 14.]
166 cord_individual_obj[indivial_i,:] = [ 3. 4. 168. 172.]
167 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
168 cord_individual_obj[indivial_i,:] = [ 5. 5. 108. 113.]
169 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
170 cord_individual_obj[indivial_i,:] = [ 7. 4. 32. 36.]
171 cord_individual_obj[indivial_i,:] = [ 8. 6. 24. 30.]
172 cord_individual_obj[indivial_i,:] = [ 9. 4. 48. 52.]
173 cord_individual_obj[indivial_i,:] = [10. 6. 18. 24.]
174 cord_individual_obj[indivial_i,:] = [11. 6. 8. 14.]
175 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
176 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
177 cord_individual_obj[indivial_i,:] = [14. 4. 38. 42.]
178 cord_individual_obj[indivial_i,:] = [15. 6. 46. 52.]
179 cord_individual_obj[indivial_i,:] = [16. 4. 74. 78.]
180 cord_individual_obj[indivial_i,:] = [17. 4. 64. 68.]
181 cord_individual_obj[indivial_i,:] = [18. 6. 8. 14.]
182 cord_individual_obj[indivial_i,:] = [19. 4. 64. 68.]
183
184 min(cord_individual_obj[:,3]) = 14.0
185 historl_G_best_iter[iter,3] = 14.0
186 Begin iteration:
187
188 iter = 6
189 cord_individual_obj[indivial_i,:] = [ 0. 5. 18. 23.]
190 cord_individual_obj[indivial_i,:] = [ 1. 6. 8. 14.]
191 cord_individual_obj[indivial_i,:] = [ 2. 6. 30. 36.]
192 cord_individual_obj[indivial_i,:] = [ 3. 6. 8. 14.]
193 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
194 cord_individual_obj[indivial_i,:] = [ 5. 4. 54. 58.]
195 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
196 cord_individual_obj[indivial_i,:] = [ 7. 5. 60. 65.]
197 cord_individual_obj[indivial_i,:] = [ 8. 6. 8. 14.]
198 cord_individual_obj[indivial_i,:] = [ 9. 5. 18. 23.]
199 cord_individual_obj[indivial_i,:] = [10. 5. 80. 85.]
200 cord_individual_obj[indivial_i,:] = [11. 4. 12. 16.]
201 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
202 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
203 cord_individual_obj[indivial_i,:] = [14. 6. 8. 14.]
204 cord_individual_obj[indivial_i,:] = [15. 6. 24. 30.]
205 cord_individual_obj[indivial_i,:] = [16. 4. 38. 42.]
206 cord_individual_obj[indivial_i,:] = [17. 6. 24. 30.]
207 cord_individual_obj[indivial_i,:] = [18. 6. 8. 14.]
208 cord_individual_obj[indivial_i,:] = [19. 6. 44. 50.]
209
210 min(cord_individual_obj[:,3]) = 14.0
211 historl_G_best_iter[iter,3] = 14.0
212 Begin iteration:
213
214 iter = 7
215 cord_individual_obj[indivial_i,:] = [ 0. 6. 8. 14.]
216 cord_individual_obj[indivial_i,:] = [ 1. 6. 8. 14.]
217 cord_individual_obj[indivial_i,:] = [ 2. 6. 40. 46.]
218 cord_individual_obj[indivial_i,:] = [ 3. 4. 18. 22.]
219 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
220 cord_individual_obj[indivial_i,:] = [ 5. 6. 8. 14.]
221 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
222 cord_individual_obj[indivial_i,:] = [ 7. 6. 18. 24.]
223 cord_individual_obj[indivial_i,:] = [ 8. 6. 12. 18.]
224 cord_individual_obj[indivial_i,:] = [ 9. 6. 8. 14.]
225 cord_individual_obj[indivial_i,:] = [10. 6. 8. 14.]
226 cord_individual_obj[indivial_i,:] = [11. 6. 88. 94.]
227 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
228 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
229 cord_individual_obj[indivial_i,:] = [14. 4. 62. 66.]
230 cord_individual_obj[indivial_i,:] = [15. 6. 32. 38.]
231 cord_individual_obj[indivial_i,:] = [16. 4. 18. 22.]
232 cord_individual_obj[indivial_i,:] = [17. 5. 32. 37.]
233 cord_individual_obj[indivial_i,:] = [18. 5. 76. 81.]
234 cord_individual_obj[indivial_i,:] = [19. 6. 20. 26.]
235
236 min(cord_individual_obj[:,3]) = 14.0
237 historl_G_best_iter[iter,3] = 14.0
238 Begin iteration:
239
240 iter = 8
241 cord_individual_obj[indivial_i,:] = [ 0. 5. 54. 59.]
242 cord_individual_obj[indivial_i,:] = [ 1. 6. 8. 14.]
243 cord_individual_obj[indivial_i,:] = [ 2. 6. 18. 24.]
244 cord_individual_obj[indivial_i,:] = [ 3. 6. 32. 38.]
245 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
246 cord_individual_obj[indivial_i,:] = [ 5. 5. 80. 85.]
247 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]

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248 cord_individual_obj[indivial_i,:] = [ 7. 5. 54. 59.]
249 cord_individual_obj[indivial_i,:] = [ 8. 6. 8. 14.]
250 cord_individual_obj[indivial_i,:] = [ 9. 5. 18. 23.]
251 cord_individual_obj[indivial_i,:] = [10. 5. 32. 37.]
252 cord_individual_obj[indivial_i,:] = [11. 6. 8. 14.]
253 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
254 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
255 cord_individual_obj[indivial_i,:] = [14. 6. 8. 14.]
256 cord_individual_obj[indivial_i,:] = [15. 5. 64. 69.]
257 cord_individual_obj[indivial_i,:] = [16. 6. 8. 14.]
258 cord_individual_obj[indivial_i,:] = [17. 6. 16. 22.]
259 cord_individual_obj[indivial_i,:] = [18. 6. 8. 14.]
260 cord_individual_obj[indivial_i,:] = [19. 5. 32. 37.]
261
262 min(cord_individual_obj[:,3]) = 14.0
263 historl_G_best_iter[iter,3] = 14.0
264 Begin iteration:
265
266 iter = 9
267 cord_individual_obj[indivial_i,:] = [ 0. 4. 18. 22.]
268 cord_individual_obj[indivial_i,:] = [ 1. 6. 32. 38.]
269 cord_individual_obj[indivial_i,:] = [ 2. 6. 14. 20.]
270 cord_individual_obj[indivial_i,:] = [ 3. 4. 18. 22.]
271 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
272 cord_individual_obj[indivial_i,:] = [ 5. 6. 8. 14.]
273 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
274 cord_individual_obj[indivial_i,:] = [ 7. 5. 18. 23.]
275 cord_individual_obj[indivial_i,:] = [ 8. 6. 8. 14.]
276 cord_individual_obj[indivial_i,:] = [ 9. 6. 8. 14.]
277 cord_individual_obj[indivial_i,:] = [10. 6. 18. 24.]
278 cord_individual_obj[indivial_i,:] = [11. 5. 80. 85.]
279 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
280 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
281 cord_individual_obj[indivial_i,:] = [14. 6. 8. 14.]
282 cord_individual_obj[indivial_i,:] = [15. 4. 42. 46.]
283 cord_individual_obj[indivial_i,:] = [16. 5. 18. 23.]
284 cord_individual_obj[indivial_i,:] = [17. 4. 76. 80.]
285 cord_individual_obj[indivial_i,:] = [18. 4. 90. 94.]
286 cord_individual_obj[indivial_i,:] = [19. 6. 34. 40.]
287
288 min(cord_individual_obj[:,3]) = 14.0
289 historl_G_best_iter[iter,3] = 14.0
290 Begin iteration:
291
292 iter = 10
293 cord_individual_obj[indivial_i,:] = [ 0. 6. 8. 14.]
294 cord_individual_obj[indivial_i,:] = [ 1. 6. 18. 24.]
295 cord_individual_obj[indivial_i,:] = [ 2. 6. 28. 34.]
296 cord_individual_obj[indivial_i,:] = [ 3. 6. 8. 14.]
297 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
298 cord_individual_obj[indivial_i,:] = [ 5. 5. 54. 59.]
299 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
300 cord_individual_obj[indivial_i,:] = [ 7. 6. 8. 14.]
301 cord_individual_obj[indivial_i,:] = [ 8. 6. 28. 34.]
302 cord_individual_obj[indivial_i,:] = [ 9. 5. 62. 67.]
303 cord_individual_obj[indivial_i,:] = [10. 6. 8. 14.]
304 cord_individual_obj[indivial_i,:] = [11. 5. 12. 17.]
305 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
306 cord_individual_obj[indivial_i,:] = [13. 6. 36. 42.]
307 cord_individual_obj[indivial_i,:] = [14. 5. 18. 23.]
308 cord_individual_obj[indivial_i,:] = [15. 6. 16. 22.]
309 cord_individual_obj[indivial_i,:] = [16. 6. 8. 14.]
310 cord_individual_obj[indivial_i,:] = [17. 5. 48. 53.]
311 cord_individual_obj[indivial_i,:] = [18. 6. 8. 14.]
312 cord_individual_obj[indivial_i,:] = [19. 5. 16. 21.]
313
314 min(cord_individual_obj[:,3]) = 14.0
315 historl_G_best_iter[iter,3] = 14.0
316 Begin iteration:
317
318 iter = 11
319 cord_individual_obj[indivial_i,:] = [ 0. 4. 54. 58.]
320 cord_individual_obj[indivial_i,:] = [ 1. 6. 8. 14.]
321 cord_individual_obj[indivial_i,:] = [ 2. 6. 32. 38.]
322 cord_individual_obj[indivial_i,:] = [ 3. 4. 108. 112.]
323 cord_individual_obj[indivial_i,:] = [ 4. 6. 18. 24.]
324 cord_individual_obj[indivial_i,:] = [ 5. 6. 8. 14.]
325 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
326 cord_individual_obj[indivial_i,:] = [ 7. 5. 90. 95.]
327 cord_individual_obj[indivial_i,:] = [ 8. 6. 8. 14.]
328 cord_individual_obj[indivial_i,:] = [ 9. 6. 8. 14.]
329 cord_individual_obj[indivial_i,:] = [10. 5. 90. 95.]
330 cord_individual_obj[indivial_i,:] = [11. 6. 8. 14.]
331 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]

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332 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
333 cord_individual_obj[indivial_i,:] = [14. 5. 54. 59.]
334 cord_individual_obj[indivial_i,:] = [15. 4. 62. 66.]
335 cord_individual_obj[indivial_i,:] = [16. 5. 38. 43.]
336 cord_individual_obj[indivial_i,:] = [17. 3. 124. 127.]
337 cord_individual_obj[indivial_i,:] = [18. 5. 90. 95.]
338 cord_individual_obj[indivial_i,:] = [19. 6. 8. 14.]
339

340 min(cord_individual_obj[:,3]) = 14.0
341 historl_G_best_iter[iter,3] = 14.0
342 Begin iteration:
343
344 iter = 12
345 cord_individual_obj[indivial_i,:] = [ 0. 4. 18. 22.]
346 cord_individual_obj[indivial_i,:] = [ 1. 6. 8. 14.]
347 cord_individual_obj[indivial_i,:] = [ 2. 6. 40. 46.]
348 cord_individual_obj[indivial_i,:] = [ 3. 4. 18. 22.]
349 cord_individual_obj[indivial_i,:] = [ 4. 6. 8. 14.]
350 cord_individual_obj[indivial_i,:] = [ 5. 4. 54. 58.]
351 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
352 cord_individual_obj[indivial_i,:] = [ 7. 4. 18. 22.]
353 cord_individual_obj[indivial_i,:] = [ 8. 6. 14. 20.]
354 cord_individual_obj[indivial_i,:] = [ 9. 3. 108. 111.]
355 cord_individual_obj[indivial_i,:] = [10. 4. 18. 22.]
356 cord_individual_obj[indivial_i,:] = [11. 3. 8. 11.]
357 cord_individual_obj[indivial_i,:] = [12. 6. 8. 14.]
358 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
359 cord_individual_obj[indivial_i,:] = [14. 4. 18. 22.]
360 cord_individual_obj[indivial_i,:] = [15. 4. 14. 18.]
361 cord_individual_obj[indivial_i,:] = [16. 6. 8. 14.]
362 cord_individual_obj[indivial_i,:] = [17. 6. 8. 14.]
363 cord_individual_obj[indivial_i,:] = [18. 5. 18. 23.]
364 cord_individual_obj[indivial_i,:] = [19. 4. 14. 18.]
365
366 min(cord_individual_obj[:,3]) = 11.0
367 historl_G_best_iter[iter,3] = 11.0
368 Begin iteration:
369
370 iter = 13
371 cord_individual_obj[indivial_i,:] = [ 0. 5. 18. 23.]
372 cord_individual_obj[indivial_i,:] = [ 1. 5. 18. 23.]
373 cord_individual_obj[indivial_i,:] = [ 2. 5. 38. 43.]
374 cord_individual_obj[indivial_i,:] = [ 3. 5. 18. 23.]
375 cord_individual_obj[indivial_i,:] = [ 4. 4. 18. 22.]
376 cord_individual_obj[indivial_i,:] = [ 5. 5. 36. 41.]
377 cord_individual_obj[indivial_i,:] = [ 6. 5. 18. 23.]
378 cord_individual_obj[indivial_i,:] = [ 7. 4. 18. 22.]
379 cord_individual_obj[indivial_i,:] = [ 8. 4. 64. 68.]
380 cord_individual_obj[indivial_i,:] = [ 9. 3. 8. 11.]
381 cord_individual_obj[indivial_i,:] = [10. 4. 18. 22.]
382 cord_individual_obj[indivial_i,:] = [11. 3. 12. 15.]
383 cord_individual_obj[indivial_i,:] = [12. 4. 18. 22.]
384 cord_individual_obj[indivial_i,:] = [13. 4. 24. 28.]
385 cord_individual_obj[indivial_i,:] = [14. 4. 34. 38.]
386 cord_individual_obj[indivial_i,:] = [15. 5. 38. 43.]
387 cord_individual_obj[indivial_i,:] = [16. 4. 18. 22.]
388 cord_individual_obj[indivial_i,:] = [17. 4. 18. 22.]
389 cord_individual_obj[indivial_i,:] = [18. 5. 18. 23.]
390 cord_individual_obj[indivial_i,:] = [19. 5. 28. 33.]
391
392 min(cord_individual_obj[:,3]) = 11.0
393 historl_G_best_iter[iter,3] = 11.0
394 Begin iteration:
395
396 iter = 14
397 cord_individual_obj[indivial_i,:] = [ 0. 5. 20. 25.]
398 cord_individual_obj[indivial_i,:] = [ 1. 5. 48. 53.]
399 cord_individual_obj[indivial_i,:] = [ 2. 5. 46. 51.]
400 cord_individual_obj[indivial_i,:] = [ 3. 5. 12. 17.]
401 cord_individual_obj[indivial_i,:] = [ 4. 4. 40. 44.]
402 cord_individual_obj[indivial_i,:] = [ 5. 5. 40. 45.]
403 cord_individual_obj[indivial_i,:] = [ 6. 5. 20. 25.]
404 cord_individual_obj[indivial_i,:] = [ 7. 3. 28. 31.]
405 cord_individual_obj[indivial_i,:] = [ 8. 3. 8. 11.]
406 cord_individual_obj[indivial_i,:] = [ 9. 3. 30. 33.]
407 cord_individual_obj[indivial_i,:] = [10. 4. 12. 16.]
408 cord_individual_obj[indivial_i,:] = [11. 3. 24. 27.]
409 cord_individual_obj[indivial_i,:] = [12. 4. 20. 24.]
410 cord_individual_obj[indivial_i,:] = [13. 4. 12. 16.]
411 cord_individual_obj[indivial_i,:] = [14. 4. 12. 16.]
412 cord_individual_obj[indivial_i,:] = [15. 5. 42. 47.]
413 cord_individual_obj[indivial_i,:] = [16. 3. 20. 23.]
414 cord_individual_obj[indivial_i,:] = [17. 5. 64. 69.]
415 cord_individual_obj[indivial_i,:] = [18. 5. 34. 39.]

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416     cord_individual_obj[indivial_i, :] = [19. 5. 28. 33.]  
417  
418     min(cord_individual_obj[:, 3]) = 11.0  
419     historl_G_best_iter[iter, 3] = 11.0  
420 Begin iteration:  
421  
422 iter = 15  
423     cord_individual_obj[indivial_i, :] = [ 0. 5. 44. 49.]  
424     cord_individual_obj[indivial_i, :] = [ 1. 5. 12. 17.]  
425     cord_individual_obj[indivial_i, :] = [ 2. 5. 36. 41.]  
426     cord_individual_obj[indivial_i, :] = [ 3. 5. 12. 17.]  
427     cord_individual_obj[indivial_i, :] = [ 4. 4. 46. 50.]  
428     cord_individual_obj[indivial_i, :] = [ 5. 5. 44. 49.]  
429     cord_individual_obj[indivial_i, :] = [ 6. 5. 28. 33.]  
430     cord_individual_obj[indivial_i, :] = [ 7. 3. 18. 21.]  
431     cord_individual_obj[indivial_i, :] = [ 8. 3. 52. 55.]  
432     cord_individual_obj[indivial_i, :] = [ 9. 3. 56. 59.]  
433     cord_individual_obj[indivial_i, :] = [10. 4. 12. 16.]  
434     cord_individual_obj[indivial_i, :] = [11. 3. 30. 33.]  
435     cord_individual_obj[indivial_i, :] = [12. 4. 44. 48.]  
436     cord_individual_obj[indivial_i, :] = [13. 4. 20. 24.]  
437     cord_individual_obj[indivial_i, :] = [14. 4. 26. 30.]  
438     cord_individual_obj[indivial_i, :] = [15. 5. 42. 47.]  
439     cord_individual_obj[indivial_i, :] = [16. 3. 56. 59.]  
440     cord_individual_obj[indivial_i, :] = [17. 3. 8. 11.]  
441     cord_individual_obj[indivial_i, :] = [18. 5. 100. 105.]  
442     cord_individual_obj[indivial_i, :] = [19. 5. 20. 25.]  
443  
444 min(cord_individual_obj[:, 3]) = 11.0  
445 historl_G_best_iter[iter, 3] = 11.0  
446 Begin iteration:  
447  
448 iter = 16  
449     cord_individual_obj[indivial_i, :] = [ 0. 5. 20. 25.]  
450     cord_individual_obj[indivial_i, :] = [ 1. 5. 12. 17.]  
451     cord_individual_obj[indivial_i, :] = [ 2. 5. 38. 43.]  
452     cord_individual_obj[indivial_i, :] = [ 3. 5. 12. 17.]  
453     cord_individual_obj[indivial_i, :] = [ 4. 4. 60. 64.]  
454     cord_individual_obj[indivial_i, :] = [ 5. 5. 28. 33.]  
455     cord_individual_obj[indivial_i, :] = [ 6. 5. 28. 33.]  
456     cord_individual_obj[indivial_i, :] = [ 7. 3. 52. 55.]  
457     cord_individual_obj[indivial_i, :] = [ 8. 3. 90. 93.]  
458     cord_individual_obj[indivial_i, :] = [ 9. 3. 30. 33.]  
459     cord_individual_obj[indivial_i, :] = [10. 4. 12. 16.]  
460     cord_individual_obj[indivial_i, :] = [11. 3. 42. 45.]  
461     cord_individual_obj[indivial_i, :] = [12. 4. 28. 32.]  
462     cord_individual_obj[indivial_i, :] = [13. 4. 28. 32.]  
463     cord_individual_obj[indivial_i, :] = [14. 4. 20. 24.]  
464     cord_individual_obj[indivial_i, :] = [15. 5. 46. 51.]  
465     cord_individual_obj[indivial_i, :] = [16. 3. 54. 57.]  
466     cord_individual_obj[indivial_i, :] = [17. 5. 52. 57.]  
467     cord_individual_obj[indivial_i, :] = [18. 3. 8. 11.]  
468     cord_individual_obj[indivial_i, :] = [19. 5. 20. 25.]  
469  
470 min(cord_individual_obj[:, 3]) = 11.0  
471 historl_G_best_iter[iter, 3] = 11.0  
472 Begin iteration:  
473  
474 iter = 17  
475     cord_individual_obj[indivial_i, :] = [ 0. 5. 44. 49.]  
476     cord_individual_obj[indivial_i, :] = [ 1. 5. 16. 21.]  
477     cord_individual_obj[indivial_i, :] = [ 2. 5. 68. 73.]  
478     cord_individual_obj[indivial_i, :] = [ 3. 5. 20. 25.]  
479     cord_individual_obj[indivial_i, :] = [ 4. 4. 50. 54.]  
480     cord_individual_obj[indivial_i, :] = [ 5. 5. 40. 45.]  
481     cord_individual_obj[indivial_i, :] = [ 6. 5. 16. 21.]  
482     cord_individual_obj[indivial_i, :] = [ 7. 3. 34. 37.]  
483     cord_individual_obj[indivial_i, :] = [ 8. 3. 8. 11.]  
484     cord_individual_obj[indivial_i, :] = [ 9. 3. 74. 77.]  
485     cord_individual_obj[indivial_i, :] = [10. 4. 24. 28.]  
486     cord_individual_obj[indivial_i, :] = [11. 3. 42. 45.]  
487     cord_individual_obj[indivial_i, :] = [12. 4. 58. 62.]  
488     cord_individual_obj[indivial_i, :] = [13. 4. 48. 52.]  
489     cord_individual_obj[indivial_i, :] = [14. 4. 20. 24.]  
490     cord_individual_obj[indivial_i, :] = [15. 5. 42. 47.]  
491     cord_individual_obj[indivial_i, :] = [16. 3. 86. 89.]  
492     cord_individual_obj[indivial_i, :] = [17. 5. 64. 69.]  
493     cord_individual_obj[indivial_i, :] = [18. 5. 34. 39.]  
494     cord_individual_obj[indivial_i, :] = [19. 5. 42. 47.]  
495  
496 min(cord_individual_obj[:, 3]) = 11.0  
497 historl_G_best_iter[iter, 3] = 11.0  
498 Begin iteration:  
499
```

unknown

```
500 iter = 18
501 cord_individual_obj[indivial_i, :] = [ 0. 5. 20. 25.]
502 cord_individual_obj[indivial_i, :] = [ 1. 5. 48. 53.]
503 cord_individual_obj[indivial_i, :] = [ 2. 5. 36. 41.]
504 cord_individual_obj[indivial_i, :] = [ 3. 5. 12. 17.]
505 cord_individual_obj[indivial_i, :] = [ 4. 4. 44. 48.]
506 cord_individual_obj[indivial_i, :] = [ 5. 5. 44. 49.]
507 cord_individual_obj[indivial_i, :] = [ 6. 5. 20. 25.]
508 cord_individual_obj[indivial_i, :] = [ 7. 3. 40. 43.]
509 cord_individual_obj[indivial_i, :] = [ 8. 3. 52. 55.]
510 cord_individual_obj[indivial_i, :] = [ 9. 3. 56. 59.]
511 cord_individual_obj[indivial_i, :] = [10. 4. 20. 24.]
512 cord_individual_obj[indivial_i, :] = [11. 3. 42. 45.]
513 cord_individual_obj[indivial_i, :] = [12. 4. 20. 24.]
514 cord_individual_obj[indivial_i, :] = [13. 4. 28. 32.]
515 cord_individual_obj[indivial_i, :] = [14. 4. 20. 24.]
516 cord_individual_obj[indivial_i, :] = [15. 5. 38. 43.]
517 cord_individual_obj[indivial_i, :] = [16. 3. 8. 11.]
518 cord_individual_obj[indivial_i, :] = [17. 5. 68. 73.]
519 cord_individual_obj[indivial_i, :] = [18. 5. 34. 39.]
520 cord_individual_obj[indivial_i, :] = [19. 5. 20. 25.]
521
522 min(cord_individual_obj[:, 3]) = 11.0
523 historl_G_best_iter[iter, 3] = 11.0
524 Begin iteration:
525
526 iter = 19
527 cord_individual_obj[indivial_i, :] = [ 0. 5. 28. 33.]
528 cord_individual_obj[indivial_i, :] = [ 1. 5. 30. 35.]
529 cord_individual_obj[indivial_i, :] = [ 2. 5. 38. 43.]
530 cord_individual_obj[indivial_i, :] = [ 3. 5. 12. 17.]
531 cord_individual_obj[indivial_i, :] = [ 4. 4. 38. 42.]
532 cord_individual_obj[indivial_i, :] = [ 5. 5. 38. 43.]
533 cord_individual_obj[indivial_i, :] = [ 6. 5. 28. 33.]
534 cord_individual_obj[indivial_i, :] = [ 7. 3. 52. 55.]
535 cord_individual_obj[indivial_i, :] = [ 8. 3. 90. 93.]
536 cord_individual_obj[indivial_i, :] = [ 9. 3. 30. 33.]
537 cord_individual_obj[indivial_i, :] = [10. 4. 20. 24.]
538 cord_individual_obj[indivial_i, :] = [11. 3. 42. 45.]
539 cord_individual_obj[indivial_i, :] = [12. 4. 44. 48.]
540 cord_individual_obj[indivial_i, :] = [13. 4. 28. 32.]
541 cord_individual_obj[indivial_i, :] = [14. 4. 38. 42.]
542 cord_individual_obj[indivial_i, :] = [15. 5. 46. 51.]
543 cord_individual_obj[indivial_i, :] = [16. 3. 30. 33.]
544 cord_individual_obj[indivial_i, :] = [17. 3. 8. 11.]
545 cord_individual_obj[indivial_i, :] = [18. 5. 34. 39.]
546 cord_individual_obj[indivial_i, :] = [19. 5. 20. 25.]
547
548 min(cord_individual_obj[:, 3]) = 11.0
549 historl_G_best_iter[iter, 3] = 11.0
550 Begin iteration:
551
552 iter = 20
553 cord_individual_obj[indivial_i, :] = [ 0. 5. 28. 33.]
554 cord_individual_obj[indivial_i, :] = [ 1. 5. 48. 53.]
555 cord_individual_obj[indivial_i, :] = [ 2. 5. 58. 63.]
556 cord_individual_obj[indivial_i, :] = [ 3. 5. 12. 17.]
557 cord_individual_obj[indivial_i, :] = [ 4. 4. 38. 42.]
558 cord_individual_obj[indivial_i, :] = [ 5. 5. 44. 49.]
559 cord_individual_obj[indivial_i, :] = [ 6. 5. 20. 25.]
560 cord_individual_obj[indivial_i, :] = [ 7. 3. 54. 57.]
561 cord_individual_obj[indivial_i, :] = [ 8. 3. 8. 11.]
562 cord_individual_obj[indivial_i, :] = [ 9. 3. 56. 59.]
563 cord_individual_obj[indivial_i, :] = [10. 4. 28. 32.]
564 cord_individual_obj[indivial_i, :] = [11. 3. 42. 45.]
565 cord_individual_obj[indivial_i, :] = [12. 4. 50. 54.]
566 cord_individual_obj[indivial_i, :] = [13. 4. 28. 32.]
567 cord_individual_obj[indivial_i, :] = [14. 4. 20. 24.]
568 cord_individual_obj[indivial_i, :] = [15. 5. 42. 47.]
569 cord_individual_obj[indivial_i, :] = [16. 3. 70. 73.]
570 cord_individual_obj[indivial_i, :] = [17. 5. 52. 57.]
571 cord_individual_obj[indivial_i, :] = [18. 5. 34. 39.]
572 cord_individual_obj[indivial_i, :] = [19. 5. 20. 25.]
573
574 min(cord_individual_obj[:, 3]) = 11.0
575 historl_G_best_iter[iter, 3] = 11.0
576 Iteration calculate over
577
578
579
580
581 All item are in Bin and:
582 Bin area = 1080
583 Real_area = 101.0
```

```

584 Proportion_of_area = 0.09351851851851851
585 BEST_CHROM =
586     berth: [ 5.5 26. 11. 20.5 1.5 16. ]
587     time: [0. 0. 0. 0. 0.]
588     num_QC: [2. 2. 5. 3. 3. 3.]
589 Objective function values and some other indicators:
590     Obj0 = 3.00          Obj1 = 8.00          Obj0 + Obj1 = 11.00
591 Total movement of crane: 8.00
592 Total waiting time in berth position: 0.00
593 Total index of q during berthing: 518.00
594 Specific arrangement for each vessel:
595     V_id: 0           li: 5.0           xi: 5.5           bow of i: 3.0           tail of i: 8.0           gama_i0: 0.0           gama_i1: 1.0
596     .0                 gama_i1 + 1: 2.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 80.0           work load_i:
80.0           work load gap_i: 0
597     V_id: 1           li: 6.0           xi: 26.0           bow of i: 23.0           tail of i: 29.0           gama_i0: 0.0           gama_i1: 2
.0                 gama_i1 + 1: 3.0       gama_i1 - gama_i0: 2.0           duration_time_i: 3.0           demand_i: 120.0           work
load_i: 120.0           work load gap_i: 0
598     V_id: 2           li: 6.0           xi: 11.0           bow of i: 8.0           tail of i: 14.0           gama_i0: 0.0           gama_i1: 2
.0                 gama_i1 + 1: 3.0       gama_i1 - gama_i0: 2.0           duration_time_i: 3.0           demand_i: 260.0           work
load_i: 260.0           work load gap_i: 0
599     V_id: 3           li: 5.0           xi: 20.5           bow of i: 18.0           tail of i: 23.0           gama_i0: 0.0           gama_i1: 1
.0                 gama_i1 + 1: 2.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 80.0           work
load_i: 80.0           work load gap_i: 0
600     V_id: 4           li: 3.0           xi: 1.5            bow of i: 0.0           tail of i: 3.0           gama_i0: 0.0           gama_i1: 3.0
200.0           gama_i1 + 1: 4.0       gama_i1 - gama_i0: 3.0           duration_time_i: 4.0           demand_i: 200.0           work load_i:
601           work load gap_i: 0
602 Algorithm finished and the total CPU time: 151 s
603 End
604

```