

unknown

```

80 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]
81 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
82 cord_individual_obj[indivial_i, :] = [18. 3. 0. 3.]
83 cord_individual_obj[indivial_i, :] = [19. 2. 0. 2.]
84 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]
85 cord_individual_obj[indivial_i, :] = [21. 2. 0. 2.]
86 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]
87 cord_individual_obj[indivial_i, :] = [23. 3. 0. 3.]
88 cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]
89
90 min(cord_individual_obj[:, 3]) = 2.0
91 historl_G_best_iter[iter, 3] = 2.0
92 Begin iteration:
93
94 iter = 2
95 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
96 cord_individual_obj[indivial_i, :] = [1. 3. 0. 3.]
97 cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]
98 cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]
99 cord_individual_obj[indivial_i, :] = [4. 3. 0. 3.]
100 cord_individual_obj[indivial_i, :] = [5. 3. 0. 3.]
101 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
102 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]
103 cord_individual_obj[indivial_i, :] = [8. 3. 0. 3.]
104 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]
105 cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]
106 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
107 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
108 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
109 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
110 cord_individual_obj[indivial_i, :] = [15. 2. 0. 2.]
111 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]
112 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
113 cord_individual_obj[indivial_i, :] = [18. 3. 0. 3.]
114 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]
115 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]
116 cord_individual_obj[indivial_i, :] = [21. 2. 0. 2.]
117 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]
118 cord_individual_obj[indivial_i, :] = [23. 3. 0. 3.]
119 cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]
120
121 min(cord_individual_obj[:, 3]) = 2.0
122 historl_G_best_iter[iter, 3] = 2.0
123 Begin iteration:
124
125 iter = 3
126 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
127 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]
128 cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]
129 cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]
130 cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]
131 cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]
132 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
133 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]
134 cord_individual_obj[indivial_i, :] = [8. 3. 0. 3.]
135 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]
136 cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]
137 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
138 cord_individual_obj[indivial_i, :] = [12. 2. 0. 2.]
139 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
140 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
141 cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]
142 cord_individual_obj[indivial_i, :] = [16. 2. 0. 2.]
143 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
144 cord_individual_obj[indivial_i, :] = [18. 3. 0. 3.]
145 cord_individual_obj[indivial_i, :] = [19. 2. 0. 2.]
146 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]
147 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]
148 cord_individual_obj[indivial_i, :] = [22. 3. 0. 3.]
149 cord_individual_obj[indivial_i, :] = [23. 3. 0. 3.]
150 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]
151
152 min(cord_individual_obj[:, 3]) = 2.0
153 historl_G_best_iter[iter, 3] = 2.0
154 Begin iteration:
155
156 iter = 4
157 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
158 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]
159 cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]
160 cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]
161 cord_individual_obj[indivial_i, :] = [4. 3. 0. 3.]
162 cord_individual_obj[indivial_i, :] = [5. 3. 0. 3.]
163 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]

```

```

164 cord_individual_obj[indivial_i, :] = [7. 3. 0. 3.]
165 cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]
166 cord_individual_obj[indivial_i, :] = [9. 3. 0. 3.]
167 cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]
168 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
169 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
170 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
171 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
172 cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]
173 cord_individual_obj[indivial_i, :] = [16. 2. 0. 2.]
174 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
175 cord_individual_obj[indivial_i, :] = [18. 3. 0. 3.]
176 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]
177 cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]
178 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]
179 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]
180 cord_individual_obj[indivial_i, :] = [23. 3. 0. 3.]
181 cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]
182
183 min(cord_individual_obj[:, 3]) = 2.0
184 historl_G_best_iter[iter, 3] = 2.0
185 Begin iteration:
186
187 iter = 5
188 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
189 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]
190 cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]
191 cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]
192 cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]
193 cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]
194 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
195 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]
196 cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]
197 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]
198 cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]
199 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
200 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
201 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
202 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
203 cord_individual_obj[indivial_i, :] = [15. 2. 0. 2.]
204 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]
205 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
206 cord_individual_obj[indivial_i, :] = [18. 3. 0. 3.]
207 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]
208 cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]
209 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]
210 cord_individual_obj[indivial_i, :] = [22. 3. 0. 3.]
211 cord_individual_obj[indivial_i, :] = [23. 3. 0. 3.]
212 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]
213
214 min(cord_individual_obj[:, 3]) = 2.0
215 historl_G_best_iter[iter, 3] = 2.0
216 Begin iteration:
217
218 iter = 6
219 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
220 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]
221 cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]
222 cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]
223 cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]
224 cord_individual_obj[indivial_i, :] = [5. 3. 0. 3.]
225 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
226 cord_individual_obj[indivial_i, :] = [7. 3. 0. 3.]
227 cord_individual_obj[indivial_i, :] = [8. 3. 0. 3.]
228 cord_individual_obj[indivial_i, :] = [9. 3. 0. 3.]
229 cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]
230 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
231 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
232 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
233 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
234 cord_individual_obj[indivial_i, :] = [15. 2. 0. 2.]
235 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]
236 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
237 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]
238 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]
239 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]
240 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]
241 cord_individual_obj[indivial_i, :] = [22. 3. 0. 3.]
242 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]
243 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]
244
245 min(cord_individual_obj[:, 3]) = 2.0
246 historl_G_best_iter[iter, 3] = 2.0
247 Begin iteration:

```

```

248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
251 cord_individual_obj[indivial_i, :] = [1. 3. 0. 3.]
252 cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]
253 cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]
254 cord_individual_obj[indivial_i, :] = [4. 3. 0. 3.]
255 cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]
256 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
257 cord_individual_obj[indivial_i, :] = [7. 3. 0. 3.]
258 cord_individual_obj[indivial_i, :] = [8. 3. 0. 3.]
259 cord_individual_obj[indivial_i, :] = [9. 3. 0. 3.]
260 cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]
261 cord_individual_obj[indivial_i, :] = [11. 2. 0. 2.]
262 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
263 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
264 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
265 cord_individual_obj[indivial_i, :] = [15. 2. 0. 2.]
266 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]
267 cord_individual_obj[indivial_i, :] = [17. 2. 0. 2.]
268 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]
269 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]
270 cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]
271 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]
272 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]
273 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]
274 cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]
275

276 min(cord_individual_obj[:, 3]) = 2.0
277 historl_G_best_iter[iter, 3] = 2.0
278 Begin iteration:
279
280 iter = 8
281 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
282 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]
283 cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]
284 cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]
285 cord_individual_obj[indivial_i, :] = [4. 3. 0. 3.]
286 cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]
287 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
288 cord_individual_obj[indivial_i, :] = [7. 3. 0. 3.]
289 cord_individual_obj[indivial_i, :] = [8. 3. 0. 3.]
290 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]
291 cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]
292 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
293 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
294 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
295 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
296 cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]
297 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]
298 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
299 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]
300 cord_individual_obj[indivial_i, :] = [19. 2. 0. 2.]
301 cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]
302 cord_individual_obj[indivial_i, :] = [21. 2. 0. 2.]
303 cord_individual_obj[indivial_i, :] = [22. 3. 0. 3.]
304 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]
305 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]
306

307 min(cord_individual_obj[:, 3]) = 2.0
308 historl_G_best_iter[iter, 3] = 2.0
309 Begin iteration:
310
311 iter = 9
312 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]
313 cord_individual_obj[indivial_i, :] = [1. 3. 0. 3.]
314 cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]
315 cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]
316 cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]
317 cord_individual_obj[indivial_i, :] = [5. 3. 0. 3.]
318 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]
319 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]
320 cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]
321 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]
322 cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]
323 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]
324 cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]
325 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]
326 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
327 cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]
328 cord_individual_obj[indivial_i, :] = [16. 2. 0. 2.]
329 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]
330 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]
331 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]

```

unknown

```
332 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]  
333 cord_individual_obj[indivial_i, :] = [21. 2. 0. 2.]  
334 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]  
335 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]  
336 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]  
337  
338 min(cord_individual_obj[:, 3]) = 2.0  
339 historl_G_best_iter[iter, 3] = 2.0  
340 Begin iteration:  
341  
342 iter = 10  
343 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]  
344 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]  
345 cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]  
346 cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]  
347 cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]  
348 cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]  
349 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]  
350 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]  
351 cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]  
352 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]  
353 cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]  
354 cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]  
355 cord_individual_obj[indivial_i, :] = [12. 2. 0. 2.]  
356 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]  
357 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]  
358 cord_individual_obj[indivial_i, :] = [15. 2. 0. 2.]  
359 cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]  
360 cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]  
361 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]  
362 cord_individual_obj[indivial_i, :] = [19. 2. 0. 2.]  
363 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]  
364 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]  
365 cord_individual_obj[indivial_i, :] = [22. 3. 0. 3.]  
366 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]  
367 cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]  
368  
369 min(cord_individual_obj[:, 3]) = 2.0  
370 historl_G_best_iter[iter, 3] = 2.0  
371 Begin iteration:  
372  
373 iter = 11  
374 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]  
375 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]  
376 cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]  
377 cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]  
378 cord_individual_obj[indivial_i, :] = [4. 3. 0. 3.]  
379 cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]  
380 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]  
381 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]  
382 cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]  
383 cord_individual_obj[indivial_i, :] = [9. 3. 0. 3.]  
384 cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]  
385 cord_individual_obj[indivial_i, :] = [11. 2. 0. 2.]  
386 cord_individual_obj[indivial_i, :] = [12. 2. 0. 2.]  
387 cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]  
388 cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]  
389 cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]  
390 cord_individual_obj[indivial_i, :] = [16. 2. 0. 2.]  
391 cord_individual_obj[indivial_i, :] = [17. 2. 0. 2.]  
392 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]  
393 cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]  
394 cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]  
395 cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]  
396 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]  
397 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]  
398 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]  
399  
400 min(cord_individual_obj[:, 3]) = 2.0  
401 historl_G_best_iter[iter, 3] = 2.0  
402 Begin iteration:  
403  
404 iter = 12  
405 cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]  
406 cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]  
407 cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]  
408 cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]  
409 cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]  
410 cord_individual_obj[indivial_i, :] = [5. 3. 0. 3.]  
411 cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]  
412 cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]  
413 cord_individual_obj[indivial_i, :] = [8. 3. 0. 3.]  
414 cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]  
415 cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]
```

```

416 cord_individual_obj[indivial_i,:] = [11. 3. 0. 3.]
417 cord_individual_obj[indivial_i,:] = [12. 2. 0. 2.]
418 cord_individual_obj[indivial_i,:] = [13. 2. 0. 2.]
419 cord_individual_obj[indivial_i,:] = [14. 2. 0. 2.]
420 cord_individual_obj[indivial_i,:] = [15. 3. 0. 3.]
421 cord_individual_obj[indivial_i,:] = [16. 2. 0. 2.]
422 cord_individual_obj[indivial_i,:] = [17. 3. 0. 3.]
423 cord_individual_obj[indivial_i,:] = [18. 2. 0. 2.]
424 cord_individual_obj[indivial_i,:] = [19. 2. 0. 2.]
425 cord_individual_obj[indivial_i,:] = [20. 3. 0. 3.]
426 cord_individual_obj[indivial_i,:] = [21. 3. 0. 3.]
427 cord_individual_obj[indivial_i,:] = [22. 3. 0. 3.]
428 cord_individual_obj[indivial_i,:] = [23. 2. 0. 2.]
429 cord_individual_obj[indivial_i,:] = [24. 3. 0. 3.]
430
431 min(cord_individual_obj[:,3]) = 2.0
432 histol_G_best_iter[iter,3] = 2.0
433 Begin iteration:
434
435 iter = 13
436 cord_individual_obj[indivial_i,:] = [0. 2. 0. 2.]
437 cord_individual_obj[indivial_i,:] = [1. 3. 0. 3.]
438 cord_individual_obj[indivial_i,:] = [2. 2. 0. 2.]
439 cord_individual_obj[indivial_i,:] = [3. 2. 0. 2.]
440 cord_individual_obj[indivial_i,:] = [4. 2. 0. 2.]
441 cord_individual_obj[indivial_i,:] = [5. 2. 0. 2.]
442 cord_individual_obj[indivial_i,:] = [6. 2. 0. 2.]
443 cord_individual_obj[indivial_i,:] = [7. 3. 0. 3.]
444 cord_individual_obj[indivial_i,:] = [8. 3. 0. 3.]
445 cord_individual_obj[indivial_i,:] = [9. 3. 0. 3.]
446 cord_individual_obj[indivial_i,:] = [10. 3. 0. 3.]
447 cord_individual_obj[indivial_i,:] = [11. 3. 0. 3.]
448 cord_individual_obj[indivial_i,:] = [12. 3. 0. 3.]
449 cord_individual_obj[indivial_i,:] = [13. 2. 0. 2.]
450 cord_individual_obj[indivial_i,:] = [14. 2. 0. 2.]
451 cord_individual_obj[indivial_i,:] = [15. 2. 0. 2.]
452 cord_individual_obj[indivial_i,:] = [16. 2. 0. 2.]
453 cord_individual_obj[indivial_i,:] = [17. 3. 0. 3.]
454 cord_individual_obj[indivial_i,:] = [18. 2. 0. 2.]
455 cord_individual_obj[indivial_i,:] = [19. 2. 0. 2.]
456 cord_individual_obj[indivial_i,:] = [20. 2. 0. 2.]
457 cord_individual_obj[indivial_i,:] = [21. 3. 0. 3.]
458 cord_individual_obj[indivial_i,:] = [22. 2. 0. 2.]
459 cord_individual_obj[indivial_i,:] = [23. 2. 0. 2.]
460 cord_individual_obj[indivial_i,:] = [24. 2. 0. 2.]
461
462 min(cord_individual_obj[:,3]) = 2.0
463 histol_G_best_iter[iter,3] = 2.0
464 Begin iteration:
465
466 iter = 14
467 cord_individual_obj[indivial_i,:] = [0. 2. 0. 2.]
468 cord_individual_obj[indivial_i,:] = [1. 2. 0. 2.]
469 cord_individual_obj[indivial_i,:] = [2. 3. 0. 3.]
470 cord_individual_obj[indivial_i,:] = [3. 2. 0. 2.]
471 cord_individual_obj[indivial_i,:] = [4. 3. 0. 3.]
472 cord_individual_obj[indivial_i,:] = [5. 2. 0. 2.]
473 cord_individual_obj[indivial_i,:] = [6. 2. 0. 2.]
474 cord_individual_obj[indivial_i,:] = [7. 2. 0. 2.]
475 cord_individual_obj[indivial_i,:] = [8. 3. 0. 3.]
476 cord_individual_obj[indivial_i,:] = [9. 3. 0. 3.]
477 cord_individual_obj[indivial_i,:] = [10. 3. 0. 3.]
478 cord_individual_obj[indivial_i,:] = [11. 2. 0. 2.]
479 cord_individual_obj[indivial_i,:] = [12. 3. 0. 3.]
480 cord_individual_obj[indivial_i,:] = [13. 2. 0. 2.]
481 cord_individual_obj[indivial_i,:] = [14. 2. 0. 2.]
482 cord_individual_obj[indivial_i,:] = [15. 3. 0. 3.]
483 cord_individual_obj[indivial_i,:] = [16. 2. 0. 2.]
484 cord_individual_obj[indivial_i,:] = [17. 2. 0. 2.]
485 cord_individual_obj[indivial_i,:] = [18. 2. 0. 2.]
486 cord_individual_obj[indivial_i,:] = [19. 3. 0. 3.]
487 cord_individual_obj[indivial_i,:] = [20. 2. 0. 2.]
488 cord_individual_obj[indivial_i,:] = [21. 3. 0. 3.]
489 cord_individual_obj[indivial_i,:] = [22. 3. 0. 3.]
490 cord_individual_obj[indivial_i,:] = [23. 2. 0. 2.]
491 cord_individual_obj[indivial_i,:] = [24. 3. 0. 3.]
492
493 min(cord_individual_obj[:,3]) = 2.0
494 histol_G_best_iter[iter,3] = 2.0
495 Begin iteration:
496
497 iter = 15
498 cord_individual_obj[indivial_i,:] = [0. 2. 0. 2.]
499 cord_individual_obj[indivial_i,:] = [1. 2. 0. 2.]

```

```

500 cord_individual_obj[indivial_i,:] = [2. 2. 0. 2.]
501 cord_individual_obj[indivial_i,:] = [3. 2. 0. 2.]
502 cord_individual_obj[indivial_i,:] = [4. 2. 0. 2.]
503 cord_individual_obj[indivial_i,:] = [5. 2. 0. 2.]
504 cord_individual_obj[indivial_i,:] = [6. 2. 0. 2.]
505 cord_individual_obj[indivial_i,:] = [7. 3. 0. 3.]
506 cord_individual_obj[indivial_i,:] = [8. 2. 0. 2.]
507 cord_individual_obj[indivial_i,:] = [9. 2. 0. 2.]
508 cord_individual_obj[indivial_i,:] = [10. 3. 0. 3.]
509 cord_individual_obj[indivial_i,:] = [11. 3. 0. 3.]
510 cord_individual_obj[indivial_i,:] = [12. 3. 0. 3.]
511 cord_individual_obj[indivial_i,:] = [13. 2. 0. 2.]
512 cord_individual_obj[indivial_i,:] = [14. 2. 0. 2.]
513 cord_individual_obj[indivial_i,:] = [15. 3. 0. 3.]
514 cord_individual_obj[indivial_i,:] = [16. 3. 0. 3.]
515 cord_individual_obj[indivial_i,:] = [17. 3. 0. 3.]
516 cord_individual_obj[indivial_i,:] = [18. 2. 0. 2.]
517 cord_individual_obj[indivial_i,:] = [19. 2. 0. 2.]
518 cord_individual_obj[indivial_i,:] = [20. 3. 0. 3.]
519 cord_individual_obj[indivial_i,:] = [21. 2. 0. 2.]
520 cord_individual_obj[indivial_i,:] = [22. 2. 0. 2.]
521 cord_individual_obj[indivial_i,:] = [23. 2. 0. 2.]
522 cord_individual_obj[indivial_i,:] = [24. 3. 0. 3.]
523
524 min(cord_individual_obj[:,3]) = 2.0
525 histol_G_best_iter[iter, 3] = 2.0
526 Begin iteration:
527
528 iter = 16
529 cord_individual_obj[indivial_i,:] = [0. 2. 0. 2.]
530 cord_individual_obj[indivial_i,:] = [1. 3. 0. 3.]
531 cord_individual_obj[indivial_i,:] = [2. 3. 0. 3.]
532 cord_individual_obj[indivial_i,:] = [3. 3. 0. 3.]
533 cord_individual_obj[indivial_i,:] = [4. 2. 0. 2.]
534 cord_individual_obj[indivial_i,:] = [5. 2. 0. 2.]
535 cord_individual_obj[indivial_i,:] = [6. 2. 0. 2.]
536 cord_individual_obj[indivial_i,:] = [7. 2. 0. 2.]
537 cord_individual_obj[indivial_i,:] = [8. 3. 0. 3.]
538 cord_individual_obj[indivial_i,:] = [9. 2. 0. 2.]
539 cord_individual_obj[indivial_i,:] = [10. 2. 0. 2.]
540 cord_individual_obj[indivial_i,:] = [11. 2. 0. 2.]
541 cord_individual_obj[indivial_i,:] = [12. 2. 0. 2.]
542 cord_individual_obj[indivial_i,:] = [13. 2. 0. 2.]
543 cord_individual_obj[indivial_i,:] = [14. 2. 0. 2.]
544 cord_individual_obj[indivial_i,:] = [15. 2. 0. 2.]
545 cord_individual_obj[indivial_i,:] = [16. 2. 0. 2.]
546 cord_individual_obj[indivial_i,:] = [17. 2. 0. 2.]
547 cord_individual_obj[indivial_i,:] = [18. 2. 0. 2.]
548 cord_individual_obj[indivial_i,:] = [19. 2. 0. 2.]
549 cord_individual_obj[indivial_i,:] = [20. 2. 0. 2.]
550 cord_individual_obj[indivial_i,:] = [21. 2. 0. 2.]
551 cord_individual_obj[indivial_i,:] = [22. 3. 0. 3.]
552 cord_individual_obj[indivial_i,:] = [23. 2. 0. 2.]
553 cord_individual_obj[indivial_i,:] = [24. 3. 0. 3.]
554
555 min(cord_individual_obj[:,3]) = 2.0
556 histol_G_best_iter[iter, 3] = 2.0
557 Begin iteration:
558
559 iter = 17
560 cord_individual_obj[indivial_i,:] = [0. 2. 0. 2.]
561 cord_individual_obj[indivial_i,:] = [1. 2. 0. 2.]
562 cord_individual_obj[indivial_i,:] = [2. 3. 0. 3.]
563 cord_individual_obj[indivial_i,:] = [3. 2. 0. 2.]
564 cord_individual_obj[indivial_i,:] = [4. 3. 0. 3.]
565 cord_individual_obj[indivial_i,:] = [5. 2. 0. 2.]
566 cord_individual_obj[indivial_i,:] = [6. 2. 0. 2.]
567 cord_individual_obj[indivial_i,:] = [7. 2. 0. 2.]
568 cord_individual_obj[indivial_i,:] = [8. 3. 0. 3.]
569 cord_individual_obj[indivial_i,:] = [9. 2. 0. 2.]
570 cord_individual_obj[indivial_i,:] = [10. 3. 0. 3.]
571 cord_individual_obj[indivial_i,:] = [11. 3. 0. 3.]
572 cord_individual_obj[indivial_i,:] = [12. 2. 0. 2.]
573 cord_individual_obj[indivial_i,:] = [13. 2. 0. 2.]
574 cord_individual_obj[indivial_i,:] = [14. 2. 0. 2.]
575 cord_individual_obj[indivial_i,:] = [15. 3. 0. 3.]
576 cord_individual_obj[indivial_i,:] = [16. 3. 0. 3.]
577 cord_individual_obj[indivial_i,:] = [17. 3. 0. 3.]
578 cord_individual_obj[indivial_i,:] = [18. 2. 0. 2.]
579 cord_individual_obj[indivial_i,:] = [19. 2. 0. 2.]
580 cord_individual_obj[indivial_i,:] = [20. 2. 0. 2.]
581 cord_individual_obj[indivial_i,:] = [21. 2. 0. 2.]
582 cord_individual_obj[indivial_i,:] = [22. 2. 0. 2.]
583 cord_individual_obj[indivial_i,:] = [23. 2. 0. 2.]

```

unknown

```
584     cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]  
585  
586     min(cord_individual_obj[:, 3]) = 2.0  
587     historl_G_best_iter[iter, 3] = 2.0  
588 Begin iteration:  
589  
590 iter = 18  
591     cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]  
592     cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]  
593     cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]  
594     cord_individual_obj[indivial_i, :] = [3. 3. 0. 3.]  
595     cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]  
596     cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]  
597     cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]  
598     cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]  
599     cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]  
600     cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]  
601     cord_individual_obj[indivial_i, :] = [10. 3. 0. 3.]  
602     cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]  
603     cord_individual_obj[indivial_i, :] = [12. 3. 0. 3.]  
604     cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]  
605     cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]  
606     cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]  
607     cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]  
608     cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]  
609     cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]  
610     cord_individual_obj[indivial_i, :] = [19. 2. 0. 2.]  
611     cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]  
612     cord_individual_obj[indivial_i, :] = [21. 2. 0. 2.]  
613     cord_individual_obj[indivial_i, :] = [22. 3. 0. 3.]  
614     cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]  
615     cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]  
616  
617     min(cord_individual_obj[:, 3]) = 2.0  
618     historl_G_best_iter[iter, 3] = 2.0  
619 Begin iteration:  
620  
621 iter = 19  
622     cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]  
623     cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]  
624     cord_individual_obj[indivial_i, :] = [2. 3. 0. 3.]  
625     cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]  
626     cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]  
627     cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]  
628     cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]  
629     cord_individual_obj[indivial_i, :] = [7. 2. 0. 2.]  
630     cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]  
631     cord_individual_obj[indivial_i, :] = [9. 2. 0. 2.]  
632     cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]  
633     cord_individual_obj[indivial_i, :] = [11. 3. 0. 3.]  
634     cord_individual_obj[indivial_i, :] = [12. 2. 0. 2.]  
635     cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]  
636     cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]  
637     cord_individual_obj[indivial_i, :] = [15. 3. 0. 3.]  
638     cord_individual_obj[indivial_i, :] = [16. 3. 0. 3.]  
639     cord_individual_obj[indivial_i, :] = [17. 3. 0. 3.]  
640     cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]  
641     cord_individual_obj[indivial_i, :] = [19. 3. 0. 3.]  
642     cord_individual_obj[indivial_i, :] = [20. 3. 0. 3.]  
643     cord_individual_obj[indivial_i, :] = [21. 3. 0. 3.]  
644     cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]  
645     cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]  
646     cord_individual_obj[indivial_i, :] = [24. 2. 0. 2.]  
647  
648     min(cord_individual_obj[:, 3]) = 2.0  
649     historl_G_best_iter[iter, 3] = 2.0  
650 Begin iteration:  
651  
652 iter = 20  
653     cord_individual_obj[indivial_i, :] = [0. 2. 0. 2.]  
654     cord_individual_obj[indivial_i, :] = [1. 2. 0. 2.]  
655     cord_individual_obj[indivial_i, :] = [2. 2. 0. 2.]  
656     cord_individual_obj[indivial_i, :] = [3. 2. 0. 2.]  
657     cord_individual_obj[indivial_i, :] = [4. 2. 0. 2.]  
658     cord_individual_obj[indivial_i, :] = [5. 2. 0. 2.]  
659     cord_individual_obj[indivial_i, :] = [6. 2. 0. 2.]  
660     cord_individual_obj[indivial_i, :] = [7. 3. 0. 3.]  
661     cord_individual_obj[indivial_i, :] = [8. 2. 0. 2.]  
662     cord_individual_obj[indivial_i, :] = [9. 3. 0. 3.]  
663     cord_individual_obj[indivial_i, :] = [10. 2. 0. 2.]  
664     cord_individual_obj[indivial_i, :] = [11. 2. 0. 2.]  
665     cord_individual_obj[indivial_i, :] = [12. 2. 0. 2.]  
666     cord_individual_obj[indivial_i, :] = [13. 2. 0. 2.]  
667     cord_individual_obj[indivial_i, :] = [14. 2. 0. 2.]
```

```

668 cord_individual_obj[indivial_i, :] = [15. 2. 0. 2.]
669 cord_individual_obj[indivial_i, :] = [16. 2. 0. 2.]
670 cord_individual_obj[indivial_i, :] = [17. 2. 0. 2.]
671 cord_individual_obj[indivial_i, :] = [18. 2. 0. 2.]
672 cord_individual_obj[indivial_i, :] = [19. 2. 0. 2.]
673 cord_individual_obj[indivial_i, :] = [20. 2. 0. 2.]
674 cord_individual_obj[indivial_i, :] = [21. 2. 0. 2.]
675 cord_individual_obj[indivial_i, :] = [22. 2. 0. 2.]
676 cord_individual_obj[indivial_i, :] = [23. 2. 0. 2.]
677 cord_individual_obj[indivial_i, :] = [24. 3. 0. 3.]
678
679 min(cord_individual_obj[:, 3]) = 2.0
680 historl_G_best_iter[iter, 3] = 2.0
681 Iteration calculate over
682
683
684
685
686 All item are in Bin and:
687 Bin area = 1080
688 Real_area = 24.0
689 Proportion_of_area = 0.02222222222222223
690 BEST_CHROM =
691     berth: [1.5 4.5 7.5]
692     time: [0. 0. 0.]
693     num_QC: [3. 2. 1.]
694 Objective function values and some other indicators:
695 Obj0 = 2.00          Obj1 = 0.00          Obj0 + Obj1 = 2.00
696 Total movement of crane: 0.00
697 Total waiting time in berth position: 0.00
698 Total index of q during berthing: 45.00
699 Specific arrangement for each vessel:
700
701
702
703
704 Algorithm finished and the total CPU time: 92 s
705 End
706

```

V_id:	li:	xi:	bow of i:	tail of i:	gama_i0:	gama_i1:	work load_i:
0	3.0	1.5	0.0	3.0	0.0	2.0	
140.0	work load gap_i: 0		gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 140.0		
1	3.0	4.5	3.0	6.0	0.0	2.0	
120.0	work load gap_i: 0		gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0		
2	3.0	7.5	6.0	9.0	0.0	2.0	
60.0	work load gap_i: 0		gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 60.0		