

unknown

```

1 "E:\1_2020\3_06\1_06\1_06060606\1_LW_0606062\6_0606\2 python code\01_My_Python_Code\Scripts\python.exe" "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\pydevconsole.py" --mode=client --port=5791
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1_2020\3_06\1_06\1_06060606\1_LW_0606062\6_0606\2 python code\01_My_Python_Code', 'E:/1_06060606/1_06060606/1_06060606/1_LW_0606062/6_0606\2 python code/01_My_Python_Code'])
5
6 PyDev console: starting.
7
8 Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC v.1929 64 bit (AMD64)] on win32
9 >>> runfile('E:/1_06060606/1_06060606/1_06060606/1_LW_0606062/6_0606\2 python code\01_My_Python_Code/main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1_06060606/1_06060606/1_06060606/1_LW_0606062')
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11 Waiting 1s.....
12
13 This is the R_20_7_standerd_test.xlsx optimization process.
14
15 Start
16     Read basic data
17         V = 20
18         T = 36
19         Q = 23
20         L = 30
21 PSO parameter setting:
22     Trail = 31
23     maxIter_num = 20
24     W_inertia = 2.0
25     oder_type_num = 25
26     c1 = 1.5
27     c2 = 1.5
28     r1 = 0.5706863062973045
29     r2 = 0.5706863062973045
30 Begin iteration:
31
32 iter = 0
33     cord_individual_obj[indivial_i, :] = [ 0. 10. 487. 497.]
34     cord_individual_obj[indivial_i, :] = [ 1. 10. 324. 334.]
35     cord_individual_obj[indivial_i, :] = [ 2. 10. 409. 419.]
36     cord_individual_obj[indivial_i, :] = [ 3. 11. 271. 282.]
37     cord_individual_obj[indivial_i, :] = [ 4. 10. 402. 412.]
38     cord_individual_obj[indivial_i, :] = [ 5. 14. 409. 423.]
39     cord_individual_obj[indivial_i, :] = [ 6. 10. 273. 283.]
40     cord_individual_obj[indivial_i, :] = [ 7. 11. 393. 404.]
41     cord_individual_obj[indivial_i, :] = [ 8. 11. 341. 352.]
42     cord_individual_obj[indivial_i, :] = [ 9. 11. 276. 287.]
43     cord_individual_obj[indivial_i, :] = [ 10. 9. 455. 464.]
44     cord_individual_obj[indivial_i, :] = [ 11. 13. 373. 386.]
45     cord_individual_obj[indivial_i, :] = [ 12. 11. 339. 350.]
46     cord_individual_obj[indivial_i, :] = [ 13. 11. 366. 377.]
47     cord_individual_obj[indivial_i, :] = [ 14. 11. 396. 407.]
48     cord_individual_obj[indivial_i, :] = [ 15. 12. 302. 314.]
49     cord_individual_obj[indivial_i, :] = [ 16. 10. 467. 477.]
50     cord_individual_obj[indivial_i, :] = [ 17. 10. 384. 394.]
51     cord_individual_obj[indivial_i, :] = [ 18. 10. 415. 425.]
52     cord_individual_obj[indivial_i, :] = [ 19. 10. 431. 441.]
53     cord_individual_obj[indivial_i, :] = [ 20. 11. 325. 336.]
54     cord_individual_obj[indivial_i, :] = [ 21. 13. 321. 334.]
55     cord_individual_obj[indivial_i, :] = [ 22. 9. 324. 333.]
56     cord_individual_obj[indivial_i, :] = [ 23. 12. 260. 272.]
57     cord_individual_obj[indivial_i, :] = [ 24. 11. 509. 520.]
58
59 min(cord_individual_obj[:, 3]) = 272.0
60 historl_G_best_iter[iter, 3] = 272.0
61 Begin iteration:
62
63 iter = 1
64     cord_individual_obj[indivial_i, :] = [ 0. 11. 404. 415.]
65     cord_individual_obj[indivial_i, :] = [ 1. 9. 326. 335.]
66     cord_individual_obj[indivial_i, :] = [ 2. 10. 354. 364.]
67     cord_individual_obj[indivial_i, :] = [ 3. 12. 363. 375.]
68     cord_individual_obj[indivial_i, :] = [ 4. 12. 287. 299.]
69     cord_individual_obj[indivial_i, :] = [ 5. 10. 256. 266.]
70     cord_individual_obj[indivial_i, :] = [ 6. 11. 272. 283.]
71     cord_individual_obj[indivial_i, :] = [ 7. 9. 294. 303.]
72     cord_individual_obj[indivial_i, :] = [ 8. 12. 394. 406.]
73     cord_individual_obj[indivial_i, :] = [ 9. 9. 271. 280.]
74     cord_individual_obj[indivial_i, :] = [ 10. 8. 336. 344.]
75     cord_individual_obj[indivial_i, :] = [ 11. 13. 386. 399.]
76     cord_individual_obj[indivial_i, :] = [ 12. 10. 330. 340.]
77     cord_individual_obj[indivial_i, :] = [ 13. 12. 365. 377.]
78     cord_individual_obj[indivial_i, :] = [ 14. 10. 349. 359.]
79     cord_individual_obj[indivial_i, :] = [ 15. 9. 360. 369.]

```

```

80     cord_individual_obj[indivial_i, :] = [ 16. 11. 304. 315.]
81     cord_individual_obj[indivial_i, :] = [ 17. 9. 293. 302.]
82     cord_individual_obj[indivial_i, :] = [ 18. 10. 326. 336.]
83     cord_individual_obj[indivial_i, :] = [ 19. 11. 286. 297.]
84     cord_individual_obj[indivial_i, :] = [ 20. 15. 359. 374.]
85     cord_individual_obj[indivial_i, :] = [ 21. 9. 289. 298.]
86     cord_individual_obj[indivial_i, :] = [ 22. 9. 334. 343.]
87     cord_individual_obj[indivial_i, :] = [ 23. 9. 320. 329.]
88     cord_individual_obj[indivial_i, :] = [ 24. 12. 260. 272.]
89
90 min(cord_individual_obj[:, 3]) = 266.0
91 historl_G_best_iter[iter, 3] = 266.0
92 Begin iteration:
93
94 iter = 2
95     cord_individual_obj[indivial_i, :] = [ 0. 10. 256. 266.]
96     cord_individual_obj[indivial_i, :] = [ 1. 10. 311. 321.]
97     cord_individual_obj[indivial_i, :] = [ 2. 10. 332. 342.]
98     cord_individual_obj[indivial_i, :] = [ 3. 11. 326. 337.]
99     cord_individual_obj[indivial_i, :] = [ 4. 13. 354. 367.]
100    cord_individual_obj[indivial_i, :] = [ 5. 13. 432. 445.]
101    cord_individual_obj[indivial_i, :] = [ 6. 10. 259. 269.]
102    cord_individual_obj[indivial_i, :] = [ 7. 12. 354. 366.]
103    cord_individual_obj[indivial_i, :] = [ 8. 11. 305. 316.]
104    cord_individual_obj[indivial_i, :] = [ 9. 11. 309. 320.]
105    cord_individual_obj[indivial_i, :] = [ 10. 11. 377. 388.]
106    cord_individual_obj[indivial_i, :] = [ 11. 11. 335. 346.]
107    cord_individual_obj[indivial_i, :] = [ 12. 11. 294. 305.]
108    cord_individual_obj[indivial_i, :] = [ 13. 11. 363. 374.]
109    cord_individual_obj[indivial_i, :] = [ 14. 10. 292. 302.]
110    cord_individual_obj[indivial_i, :] = [ 15. 11. 319. 330.]
111    cord_individual_obj[indivial_i, :] = [ 16. 11. 328. 339.]
112    cord_individual_obj[indivial_i, :] = [ 17. 13. 429. 442.]
113    cord_individual_obj[indivial_i, :] = [ 18. 12. 297. 309.]
114    cord_individual_obj[indivial_i, :] = [ 19. 9. 305. 314.]
115    cord_individual_obj[indivial_i, :] = [ 20. 11. 349. 360.]
116    cord_individual_obj[indivial_i, :] = [ 21. 10. 335. 345.]
117    cord_individual_obj[indivial_i, :] = [ 22. 12. 308. 320.]
118    cord_individual_obj[indivial_i, :] = [ 23. 11. 297. 308.]
119    cord_individual_obj[indivial_i, :] = [ 24. 10. 246. 256.]
120
121 min(cord_individual_obj[:, 3]) = 256.0
122 historl_G_best_iter[iter, 3] = 256.0
123 Begin iteration:
124
125 iter = 3
126     cord_individual_obj[indivial_i, :] = [ 0. 12. 328. 340.]
127     cord_individual_obj[indivial_i, :] = [ 1. 10. 344. 354.]
128     cord_individual_obj[indivial_i, :] = [ 2. 12. 366. 378.]
129     cord_individual_obj[indivial_i, :] = [ 3. 10. 341. 351.]
130     cord_individual_obj[indivial_i, :] = [ 4. 11. 293. 304.]
131     cord_individual_obj[indivial_i, :] = [ 5. 10. 246. 256.]
132     cord_individual_obj[indivial_i, :] = [ 6. 12. 412. 424.]
133     cord_individual_obj[indivial_i, :] = [ 7. 9. 240. 249.]
134     cord_individual_obj[indivial_i, :] = [ 8. 10. 333. 343.]
135     cord_individual_obj[indivial_i, :] = [ 9. 10. 289. 299.]
136     cord_individual_obj[indivial_i, :] = [ 10. 13. 243. 256.]
137     cord_individual_obj[indivial_i, :] = [ 11. 11. 299. 310.]
138     cord_individual_obj[indivial_i, :] = [ 12. 11. 333. 344.]
139     cord_individual_obj[indivial_i, :] = [ 13. 12. 341. 353.]
140     cord_individual_obj[indivial_i, :] = [ 14. 11. 370. 381.]
141     cord_individual_obj[indivial_i, :] = [ 15. 10. 360. 370.]
142     cord_individual_obj[indivial_i, :] = [ 16. 13. 354. 367.]
143     cord_individual_obj[indivial_i, :] = [ 17. 10. 403. 413.]
144     cord_individual_obj[indivial_i, :] = [ 18. 9. 328. 337.]
145     cord_individual_obj[indivial_i, :] = [ 19. 9. 289. 298.]
146     cord_individual_obj[indivial_i, :] = [ 20. 10. 345. 355.]
147     cord_individual_obj[indivial_i, :] = [ 21. 11. 377. 388.]
148     cord_individual_obj[indivial_i, :] = [ 22. 10. 352. 362.]
149     cord_individual_obj[indivial_i, :] = [ 23. 11. 269. 280.]
150     cord_individual_obj[indivial_i, :] = [ 24. 12. 359. 371.]
151
152 min(cord_individual_obj[:, 3]) = 249.0
153 historl_G_best_iter[iter, 3] = 249.0
154 Begin iteration:
155
156 iter = 4
157     cord_individual_obj[indivial_i, :] = [ 0. 13. 338. 351.]
158     cord_individual_obj[indivial_i, :] = [ 1. 10. 269. 279.]
159     cord_individual_obj[indivial_i, :] = [ 2. 12. 276. 288.]
160     cord_individual_obj[indivial_i, :] = [ 3. 9. 297. 306.]
161     cord_individual_obj[indivial_i, :] = [ 4. 10. 303. 313.]
162     cord_individual_obj[indivial_i, :] = [ 5. 12. 324. 336.]
163     cord_individual_obj[indivial_i, :] = [ 6. 9. 240. 249.]

```

```

164 cord_individual_obj[indivial_i,:] = [ 7. 12. 283. 295.]
165 cord_individual_obj[indivial_i,:] = [ 8. 9. 269. 278.]
166 cord_individual_obj[indivial_i,:] = [ 9. 12. 304. 316.]
167 cord_individual_obj[indivial_i,:] = [ 10. 11. 314. 325.]
168 cord_individual_obj[indivial_i,:] = [ 11. 12. 388. 400.]
169 cord_individual_obj[indivial_i,:] = [ 12. 11. 317. 328.]
170 cord_individual_obj[indivial_i,:] = [ 13. 14. 356. 370.]
171 cord_individual_obj[indivial_i,:] = [ 14. 10. 322. 332.]
172 cord_individual_obj[indivial_i,:] = [ 15. 10. 361. 371.]
173 cord_individual_obj[indivial_i,:] = [ 16. 12. 354. 366.]
174 cord_individual_obj[indivial_i,:] = [ 17. 12. 306. 318.]
175 cord_individual_obj[indivial_i,:] = [ 18. 11. 371. 382.]
176 cord_individual_obj[indivial_i,:] = [ 19. 12. 293. 305.]
177 cord_individual_obj[indivial_i,:] = [ 20. 10. 307. 317.]
178 cord_individual_obj[indivial_i,:] = [ 21. 11. 387. 398.]
179 cord_individual_obj[indivial_i,:] = [ 22. 12. 320. 332.]
180 cord_individual_obj[indivial_i,:] = [ 23. 10. 284. 294.]
181 cord_individual_obj[indivial_i,:] = [ 24. 12. 331. 343.]
182
183 min(cord_individual_obj[:,3]) = 249.0
184 historl_G_best_iter[iter, 3] = 249.0
185 Begin iteration:
186
187 iter = 5
188 cord_individual_obj[indivial_i,:] = [ 0. 12. 307. 319.]
189 cord_individual_obj[indivial_i,:] = [ 1. 10. 246. 256.]
190 cord_individual_obj[indivial_i,:] = [ 2. 11. 242. 253.]
191 cord_individual_obj[indivial_i,:] = [ 3. 10. 261. 271.]
192 cord_individual_obj[indivial_i,:] = [ 4. 10. 288. 298.]
193 cord_individual_obj[indivial_i,:] = [ 5. 12. 341. 353.]
194 cord_individual_obj[indivial_i,:] = [ 6. 11. 231. 242.]
195 cord_individual_obj[indivial_i,:] = [ 7. 12. 308. 320.]
196 cord_individual_obj[indivial_i,:] = [ 8. 10. 343. 353.]
197 cord_individual_obj[indivial_i,:] = [ 9. 12. 313. 325.]
198 cord_individual_obj[indivial_i,:] = [ 10. 10. 322. 332.]
199 cord_individual_obj[indivial_i,:] = [ 11. 9. 240. 249.]
200 cord_individual_obj[indivial_i,:] = [ 12. 13. 310. 323.]
201 cord_individual_obj[indivial_i,:] = [ 13. 13. 293. 306.]
202 cord_individual_obj[indivial_i,:] = [ 14. 11. 275. 286.]
203 cord_individual_obj[indivial_i,:] = [ 15. 13. 310. 323.]
204 cord_individual_obj[indivial_i,:] = [ 16. 15. 310. 325.]
205 cord_individual_obj[indivial_i,:] = [ 17. 12. 263. 275.]
206 cord_individual_obj[indivial_i,:] = [ 18. 11. 358. 369.]
207 cord_individual_obj[indivial_i,:] = [ 19. 9. 281. 290.]
208 cord_individual_obj[indivial_i,:] = [ 20. 9. 298. 307.]
209 cord_individual_obj[indivial_i,:] = [ 21. 10. 300. 310.]
210 cord_individual_obj[indivial_i,:] = [ 22. 12. 304. 316.]
211 cord_individual_obj[indivial_i,:] = [ 23. 10. 302. 312.]
212 cord_individual_obj[indivial_i,:] = [ 24. 12. 367. 379.]
213
214 min(cord_individual_obj[:,3]) = 242.0
215 historl_G_best_iter[iter, 3] = 242.0
216 Begin iteration:
217
218 iter = 6
219 cord_individual_obj[indivial_i,:] = [ 0. 11. 278. 289.]
220 cord_individual_obj[indivial_i,:] = [ 1. 10. 252. 262.]
221 cord_individual_obj[indivial_i,:] = [ 2. 10. 251. 261.]
222 cord_individual_obj[indivial_i,:] = [ 3. 12. 282. 294.]
223 cord_individual_obj[indivial_i,:] = [ 4. 10. 249. 259.]
224 cord_individual_obj[indivial_i,:] = [ 5. 11. 272. 283.]
225 cord_individual_obj[indivial_i,:] = [ 6. 11. 289. 300.]
226 cord_individual_obj[indivial_i,:] = [ 7. 11. 307. 318.]
227 cord_individual_obj[indivial_i,:] = [ 8. 11. 358. 369.]
228 cord_individual_obj[indivial_i,:] = [ 9. 11. 261. 272.]
229 cord_individual_obj[indivial_i,:] = [ 10. 10. 309. 319.]
230 cord_individual_obj[indivial_i,:] = [ 11. 11. 272. 283.]
231 cord_individual_obj[indivial_i,:] = [ 12. 13. 333. 346.]
232 cord_individual_obj[indivial_i,:] = [ 13. 12. 282. 294.]
233 cord_individual_obj[indivial_i,:] = [ 14. 11. 289. 300.]
234 cord_individual_obj[indivial_i,:] = [ 15. 13. 309. 322.]
235 cord_individual_obj[indivial_i,:] = [ 16. 12. 301. 313.]
236 cord_individual_obj[indivial_i,:] = [ 17. 11. 355. 366.]
237 cord_individual_obj[indivial_i,:] = [ 18. 11. 300. 311.]
238 cord_individual_obj[indivial_i,:] = [ 19. 12. 332. 344.]
239 cord_individual_obj[indivial_i,:] = [ 20. 10. 280. 290.]
240 cord_individual_obj[indivial_i,:] = [ 21. 11. 288. 299.]
241 cord_individual_obj[indivial_i,:] = [ 22. 11. 310. 321.]
242 cord_individual_obj[indivial_i,:] = [ 23. 13. 299. 312.]
243 cord_individual_obj[indivial_i,:] = [ 24. 11. 231. 242.]
244
245 min(cord_individual_obj[:,3]) = 242.0
246 historl_G_best_iter[iter, 3] = 242.0
247 Begin iteration:

```

```

248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [ 0. 10. 371. 381.]
251 cord_individual_obj[indivial_i, :] = [ 1. 14. 369. 383.]
252 cord_individual_obj[indivial_i, :] = [ 2. 12. 307. 319.]
253 cord_individual_obj[indivial_i, :] = [ 3. 8. 291. 299.]
254 cord_individual_obj[indivial_i, :] = [ 4. 12. 317. 329.]
255 cord_individual_obj[indivial_i, :] = [ 5. 11. 323. 334.]
256 cord_individual_obj[indivial_i, :] = [ 6. 10. 292. 302.]
257 cord_individual_obj[indivial_i, :] = [ 7. 12. 216. 228.]
258 cord_individual_obj[indivial_i, :] = [ 8. 11. 231. 242.]
259 cord_individual_obj[indivial_i, :] = [ 9. 13. 333. 346.]
260 cord_individual_obj[indivial_i, :] = [ 10. 9. 223. 232.]
261 cord_individual_obj[indivial_i, :] = [ 11. 12. 387. 399.]
262 cord_individual_obj[indivial_i, :] = [ 12. 13. 374. 387.]
263 cord_individual_obj[indivial_i, :] = [ 13. 12. 316. 328.]
264 cord_individual_obj[indivial_i, :] = [ 14. 9. 256. 265.]
265 cord_individual_obj[indivial_i, :] = [ 15. 12. 345. 357.]
266 cord_individual_obj[indivial_i, :] = [ 16. 14. 350. 364.]
267 cord_individual_obj[indivial_i, :] = [ 17. 12. 251. 263.]
268 cord_individual_obj[indivial_i, :] = [ 18. 11. 255. 266.]
269 cord_individual_obj[indivial_i, :] = [ 19. 12. 278. 290.]
270 cord_individual_obj[indivial_i, :] = [ 20. 12. 301. 313.]
271 cord_individual_obj[indivial_i, :] = [ 21. 8. 284. 292.]
272 cord_individual_obj[indivial_i, :] = [ 22. 12. 337. 349.]
273 cord_individual_obj[indivial_i, :] = [ 23. 13. 424. 437.]
274 cord_individual_obj[indivial_i, :] = [ 24. 11. 289. 300.]
275
276 min(cord_individual_obj[:, 3]) = 228.0
277 historl_G_best_iter[iter, 3] = 228.0
278 Begin iteration:
279
280 iter = 8
281 cord_individual_obj[indivial_i, :] = [ 0. 9. 257. 266.]
282 cord_individual_obj[indivial_i, :] = [ 1. 11. 244. 255.]
283 cord_individual_obj[indivial_i, :] = [ 2. 11. 280. 291.]
284 cord_individual_obj[indivial_i, :] = [ 3. 12. 320. 332.]
285 cord_individual_obj[indivial_i, :] = [ 4. 13. 282. 295.]
286 cord_individual_obj[indivial_i, :] = [ 5. 13. 293. 306.]
287 cord_individual_obj[indivial_i, :] = [ 6. 14. 257. 271.]
288 cord_individual_obj[indivial_i, :] = [ 7. 11. 287. 298.]
289 cord_individual_obj[indivial_i, :] = [ 8. 11. 242. 253.]
290 cord_individual_obj[indivial_i, :] = [ 9. 11. 227. 238.]
291 cord_individual_obj[indivial_i, :] = [ 10. 12. 257. 269.]
292 cord_individual_obj[indivial_i, :] = [ 11. 10. 253. 263.]
293 cord_individual_obj[indivial_i, :] = [ 12. 13. 241. 254.]
294 cord_individual_obj[indivial_i, :] = [ 13. 11. 248. 259.]
295 cord_individual_obj[indivial_i, :] = [ 14. 10. 252. 262.]
296 cord_individual_obj[indivial_i, :] = [ 15. 12. 339. 351.]
297 cord_individual_obj[indivial_i, :] = [ 16. 10. 247. 257.]
298 cord_individual_obj[indivial_i, :] = [ 17. 12. 282. 294.]
299 cord_individual_obj[indivial_i, :] = [ 18. 12. 292. 304.]
300 cord_individual_obj[indivial_i, :] = [ 19. 9. 227. 236.]
301 cord_individual_obj[indivial_i, :] = [ 20. 9. 255. 264.]
302 cord_individual_obj[indivial_i, :] = [ 21. 10. 245. 255.]
303 cord_individual_obj[indivial_i, :] = [ 22. 10. 205. 215.]
304 cord_individual_obj[indivial_i, :] = [ 23. 12. 216. 228.]
305 cord_individual_obj[indivial_i, :] = [ 24. 11. 290. 301.]
306
307 min(cord_individual_obj[:, 3]) = 215.0
308 historl_G_best_iter[iter, 3] = 215.0
309 Begin iteration:
310
311 iter = 9
312 cord_individual_obj[indivial_i, :] = [ 0. 10. 214. 224.]
313 cord_individual_obj[indivial_i, :] = [ 1. 11. 241. 252.]
314 cord_individual_obj[indivial_i, :] = [ 2. 11. 225. 236.]
315 cord_individual_obj[indivial_i, :] = [ 3. 10. 299. 309.]
316 cord_individual_obj[indivial_i, :] = [ 4. 11. 221. 232.]
317 cord_individual_obj[indivial_i, :] = [ 5. 12. 218. 230.]
318 cord_individual_obj[indivial_i, :] = [ 6. 11. 292. 303.]
319 cord_individual_obj[indivial_i, :] = [ 7. 12. 218. 230.]
320 cord_individual_obj[indivial_i, :] = [ 8. 12. 322. 334.]
321 cord_individual_obj[indivial_i, :] = [ 9. 12. 302. 314.]
322 cord_individual_obj[indivial_i, :] = [ 10. 10. 283. 293.]
323 cord_individual_obj[indivial_i, :] = [ 11. 11. 241. 252.]
324 cord_individual_obj[indivial_i, :] = [ 12. 13. 201. 214.]
325 cord_individual_obj[indivial_i, :] = [ 13. 14. 289. 303.]
326 cord_individual_obj[indivial_i, :] = [ 14. 10. 272. 282.]
327 cord_individual_obj[indivial_i, :] = [ 15. 10. 205. 215.]
328 cord_individual_obj[indivial_i, :] = [ 16. 9. 233. 242.]
329 cord_individual_obj[indivial_i, :] = [ 17. 12. 219. 231.]
330 cord_individual_obj[indivial_i, :] = [ 18. 9. 276. 285.]
331 cord_individual_obj[indivial_i, :] = [ 19. 12. 328. 340.]

```

```

332 cord_individual_obj[indivial_i, :] = [ 20. 10. 226. 236.]
333 cord_individual_obj[indivial_i, :] = [ 21. 10. 291. 301.]
334 cord_individual_obj[indivial_i, :] = [ 22. 11. 279. 290.]
335 cord_individual_obj[indivial_i, :] = [ 23. 10. 224. 234.]
336 cord_individual_obj[indivial_i, :] = [ 24. 12. 247. 259.]
337
338 min(cord_individual_obj[:, 3]) = 214.0
339 histol_G_best_iter[iter, 3] = 214.0
340 Begin iteration:
341
342 iter = 10
343 cord_individual_obj[indivial_i, :] = [ 0. 10. 223. 233.]
344 cord_individual_obj[indivial_i, :] = [ 1. 10. 253. 263.]
345 cord_individual_obj[indivial_i, :] = [ 2. 10. 288. 298.]
346 cord_individual_obj[indivial_i, :] = [ 3. 13. 281. 294.]
347 cord_individual_obj[indivial_i, :] = [ 4. 12. 234. 246.]
348 cord_individual_obj[indivial_i, :] = [ 5. 10. 304. 314.]
349 cord_individual_obj[indivial_i, :] = [ 6. 10. 222. 232.]
350 cord_individual_obj[indivial_i, :] = [ 7. 10. 162. 172.]
351 cord_individual_obj[indivial_i, :] = [ 8. 12. 194. 206.]
352 cord_individual_obj[indivial_i, :] = [ 9. 12. 305. 317.]
353 cord_individual_obj[indivial_i, :] = [ 10. 11. 249. 260.]
354 cord_individual_obj[indivial_i, :] = [ 11. 10. 185. 195.]
355 cord_individual_obj[indivial_i, :] = [ 12. 13. 260. 273.]
356 cord_individual_obj[indivial_i, :] = [ 13. 15. 269. 284.]
357 cord_individual_obj[indivial_i, :] = [ 14. 11. 216. 227.]
358 cord_individual_obj[indivial_i, :] = [ 15. 13. 285. 298.]
359 cord_individual_obj[indivial_i, :] = [ 16. 14. 321. 335.]
360 cord_individual_obj[indivial_i, :] = [ 17. 14. 236. 250.]
361 cord_individual_obj[indivial_i, :] = [ 18. 11. 216. 227.]
362 cord_individual_obj[indivial_i, :] = [ 19. 13. 201. 214.]
363 cord_individual_obj[indivial_i, :] = [ 20. 14. 269. 283.]
364 cord_individual_obj[indivial_i, :] = [ 21. 10. 172. 182.]
365 cord_individual_obj[indivial_i, :] = [ 22. 10. 230. 240.]
366 cord_individual_obj[indivial_i, :] = [ 23. 10. 276. 286.]
367 cord_individual_obj[indivial_i, :] = [ 24. 10. 197. 207.]
368
369 min(cord_individual_obj[:, 3]) = 172.0
370 histol_G_best_iter[iter, 3] = 172.0
371 Begin iteration:
372
373 iter = 11
374 cord_individual_obj[indivial_i, :] = [ 0. 10. 257. 267.]
375 cord_individual_obj[indivial_i, :] = [ 1. 10. 220. 230.]
376 cord_individual_obj[indivial_i, :] = [ 2. 12. 245. 257.]
377 cord_individual_obj[indivial_i, :] = [ 3. 11. 242. 253.]
378 cord_individual_obj[indivial_i, :] = [ 4. 14. 264. 278.]
379 cord_individual_obj[indivial_i, :] = [ 5. 11. 266. 277.]
380 cord_individual_obj[indivial_i, :] = [ 6. 11. 181. 192.]
381 cord_individual_obj[indivial_i, :] = [ 7. 11. 260. 271.]
382 cord_individual_obj[indivial_i, :] = [ 8. 15. 288. 303.]
383 cord_individual_obj[indivial_i, :] = [ 9. 11. 203. 214.]
384 cord_individual_obj[indivial_i, :] = [ 10. 10. 181. 191.]
385 cord_individual_obj[indivial_i, :] = [ 11. 9. 170. 179.]
386 cord_individual_obj[indivial_i, :] = [ 12. 12. 208. 220.]
387 cord_individual_obj[indivial_i, :] = [ 13. 12. 239. 251.]
388 cord_individual_obj[indivial_i, :] = [ 14. 12. 194. 206.]
389 cord_individual_obj[indivial_i, :] = [ 15. 12. 227. 239.]
390 cord_individual_obj[indivial_i, :] = [ 16. 10. 162. 172.]
391 cord_individual_obj[indivial_i, :] = [ 17. 13. 294. 307.]
392 cord_individual_obj[indivial_i, :] = [ 18. 13. 211. 224.]
393 cord_individual_obj[indivial_i, :] = [ 19. 11. 232. 243.]
394 cord_individual_obj[indivial_i, :] = [ 20. 12. 202. 214.]
395 cord_individual_obj[indivial_i, :] = [ 21. 12. 288. 300.]
396 cord_individual_obj[indivial_i, :] = [ 22. 11. 187. 198.]
397 cord_individual_obj[indivial_i, :] = [ 23. 8. 215. 223.]
398 cord_individual_obj[indivial_i, :] = [ 24. 11. 256. 267.]
399
400 min(cord_individual_obj[:, 3]) = 172.0
401 histol_G_best_iter[iter, 3] = 172.0
402 Begin iteration:
403
404 iter = 12
405 cord_individual_obj[indivial_i, :] = [ 0. 10. 264. 274.]
406 cord_individual_obj[indivial_i, :] = [ 1. 10. 205. 215.]
407 cord_individual_obj[indivial_i, :] = [ 2. 11. 194. 205.]
408 cord_individual_obj[indivial_i, :] = [ 3. 10. 144. 154.]
409 cord_individual_obj[indivial_i, :] = [ 4. 11. 245. 256.]
410 cord_individual_obj[indivial_i, :] = [ 5. 12. 254. 266.]
411 cord_individual_obj[indivial_i, :] = [ 6. 12. 183. 195.]
412 cord_individual_obj[indivial_i, :] = [ 7. 10. 251. 261.]
413 cord_individual_obj[indivial_i, :] = [ 8. 13. 241. 254.]
414 cord_individual_obj[indivial_i, :] = [ 9. 9. 203. 212.]
415 cord_individual_obj[indivial_i, :] = [ 10. 13. 133. 146.]

```

```

416 cord_individual_obj[indivial_i,:] = [ 11. 11. 240. 251.]
417 cord_individual_obj[indivial_i,:] = [ 12. 12. 224. 236.]
418 cord_individual_obj[indivial_i,:] = [ 13. 10. 229. 239.]
419 cord_individual_obj[indivial_i,:] = [ 14. 9. 255. 264.]
420 cord_individual_obj[indivial_i,:] = [ 15. 10. 213. 223.]
421 cord_individual_obj[indivial_i,:] = [ 16. 10. 275. 285.]
422 cord_individual_obj[indivial_i,:] = [ 17. 10. 162. 172.]
423 cord_individual_obj[indivial_i,:] = [ 18. 11. 288. 299.]
424 cord_individual_obj[indivial_i,:] = [ 19. 9. 196. 205.]
425 cord_individual_obj[indivial_i,:] = [ 20. 10. 235. 245.]
426 cord_individual_obj[indivial_i,:] = [ 21. 10. 179. 189.]
427 cord_individual_obj[indivial_i,:] = [ 22. 11. 245. 256.]
428 cord_individual_obj[indivial_i,:] = [ 23. 12. 246. 258.]
429 cord_individual_obj[indivial_i,:] = [ 24. 12. 231. 243.]
430
431 min(cord_individual_obj[:,3]) = 146.0
432 histol_G_best_iter[iter,3] = 146.0
433 Begin iteration:
434
435 iter = 13
436 cord_individual_obj[indivial_i,:] = [ 0. 9. 200. 209.]
437 cord_individual_obj[indivial_i,:] = [ 1. 13. 262. 275.]
438 cord_individual_obj[indivial_i,:] = [ 2. 9. 211. 220.]
439 cord_individual_obj[indivial_i,:] = [ 3. 8. 207. 215.]
440 cord_individual_obj[indivial_i,:] = [ 4. 10. 216. 226.]
441 cord_individual_obj[indivial_i,:] = [ 5. 10. 253. 263.]
442 cord_individual_obj[indivial_i,:] = [ 6. 9. 199. 208.]
443 cord_individual_obj[indivial_i,:] = [ 7. 10. 244. 254.]
444 cord_individual_obj[indivial_i,:] = [ 8. 9. 175. 184.]
445 cord_individual_obj[indivial_i,:] = [ 9. 9. 208. 217.]
446 cord_individual_obj[indivial_i,:] = [ 10. 12. 202. 214.]
447 cord_individual_obj[indivial_i,:] = [ 11. 9. 230. 239.]
448 cord_individual_obj[indivial_i,:] = [ 12. 10. 159. 169.]
449 cord_individual_obj[indivial_i,:] = [ 13. 9. 159. 168.]
450 cord_individual_obj[indivial_i,:] = [ 14. 10. 181. 191.]
451 cord_individual_obj[indivial_i,:] = [ 15. 9. 257. 266.]
452 cord_individual_obj[indivial_i,:] = [ 16. 9. 208. 217.]
453 cord_individual_obj[indivial_i,:] = [ 17. 8. 208. 216.]
454 cord_individual_obj[indivial_i,:] = [ 18. 13. 133. 146.]
455 cord_individual_obj[indivial_i,:] = [ 19. 9. 208. 217.]
456 cord_individual_obj[indivial_i,:] = [ 20. 13. 181. 194.]
457 cord_individual_obj[indivial_i,:] = [ 21. 10. 165. 175.]
458 cord_individual_obj[indivial_i,:] = [ 22. 11. 189. 200.]
459 cord_individual_obj[indivial_i,:] = [ 23. 12. 258. 270.]
460 cord_individual_obj[indivial_i,:] = [ 24. 8. 155. 163.]
461
462 min(cord_individual_obj[:,3]) = 146.0
463 histol_G_best_iter[iter,3] = 146.0
464 Begin iteration:
465
466 iter = 14
467 cord_individual_obj[indivial_i,:] = [ 0. 13. 227. 240.]
468 cord_individual_obj[indivial_i,:] = [ 1. 13. 133. 146.]
469 cord_individual_obj[indivial_i,:] = [ 2. 11. 199. 210.]
470 cord_individual_obj[indivial_i,:] = [ 3. 11. 243. 254.]
471 cord_individual_obj[indivial_i,:] = [ 4. 10. 159. 169.]
472 cord_individual_obj[indivial_i,:] = [ 5. 11. 225. 236.]
473 cord_individual_obj[indivial_i,:] = [ 6. 10. 283. 293.]
474 cord_individual_obj[indivial_i,:] = [ 7. 11. 211. 222.]
475 cord_individual_obj[indivial_i,:] = [ 8. 9. 234. 243.]
476 cord_individual_obj[indivial_i,:] = [ 9. 11. 183. 194.]
477 cord_individual_obj[indivial_i,:] = [ 10. 10. 215. 225.]
478 cord_individual_obj[indivial_i,:] = [ 11. 10. 205. 215.]
479 cord_individual_obj[indivial_i,:] = [ 12. 10. 130. 140.]
480 cord_individual_obj[indivial_i,:] = [ 13. 12. 183. 195.]
481 cord_individual_obj[indivial_i,:] = [ 14. 12. 243. 255.]
482 cord_individual_obj[indivial_i,:] = [ 15. 11. 196. 207.]
483 cord_individual_obj[indivial_i,:] = [ 16. 9. 224. 233.]
484 cord_individual_obj[indivial_i,:] = [ 17. 10. 180. 190.]
485 cord_individual_obj[indivial_i,:] = [ 18. 12. 221. 233.]
486 cord_individual_obj[indivial_i,:] = [ 19. 11. 213. 224.]
487 cord_individual_obj[indivial_i,:] = [ 20. 12. 214. 226.]
488 cord_individual_obj[indivial_i,:] = [ 21. 11. 168. 179.]
489 cord_individual_obj[indivial_i,:] = [ 22. 9. 224. 233.]
490 cord_individual_obj[indivial_i,:] = [ 23. 10. 192. 202.]
491 cord_individual_obj[indivial_i,:] = [ 24. 11. 184. 195.]
492
493 min(cord_individual_obj[:,3]) = 140.0
494 histol_G_best_iter[iter,3] = 140.0
495 Begin iteration:
496
497 iter = 15
498 cord_individual_obj[indivial_i,:] = [ 0. 13. 254. 267.]
499 cord_individual_obj[indivial_i,:] = [ 1. 10. 157. 167.]

```

```

500 cord_individual_obj[indivial_i, :] = [ 2. 11. 233. 244.]
501 cord_individual_obj[indivial_i, :] = [ 3. 11. 213. 224.]
502 cord_individual_obj[indivial_i, :] = [ 4. 11. 186. 197.]
503 cord_individual_obj[indivial_i, :] = [ 5. 14. 168. 182.]
504 cord_individual_obj[indivial_i, :] = [ 6. 10. 130. 140.]
505 cord_individual_obj[indivial_i, :] = [ 7. 10. 219. 229.]
506 cord_individual_obj[indivial_i, :] = [ 8. 10. 190. 200.]
507 cord_individual_obj[indivial_i, :] = [ 9. 11. 183. 194.]
508 cord_individual_obj[indivial_i, :] = [ 10. 9. 211. 220.]
509 cord_individual_obj[indivial_i, :] = [ 11. 12. 212. 224.]
510 cord_individual_obj[indivial_i, :] = [ 12. 11. 143. 154.]
511 cord_individual_obj[indivial_i, :] = [ 13. 9. 210. 219.]
512 cord_individual_obj[indivial_i, :] = [ 14. 10. 179. 189.]
513 cord_individual_obj[indivial_i, :] = [ 15. 12. 233. 245.]
514 cord_individual_obj[indivial_i, :] = [ 16. 10. 206. 216.]
515 cord_individual_obj[indivial_i, :] = [ 17. 12. 177. 189.]
516 cord_individual_obj[indivial_i, :] = [ 18. 11. 205. 216.]
517 cord_individual_obj[indivial_i, :] = [ 19. 12. 172. 184.]
518 cord_individual_obj[indivial_i, :] = [ 20. 13. 253. 266.]
519 cord_individual_obj[indivial_i, :] = [ 21. 11. 162. 173.]
520 cord_individual_obj[indivial_i, :] = [ 22. 11. 170. 181.]
521 cord_individual_obj[indivial_i, :] = [ 23. 11. 164. 175.]
522 cord_individual_obj[indivial_i, :] = [ 24. 11. 165. 176.]
523
524 min(cord_individual_obj[:, 3]) = 140.0
525 histol_G_best_iter[iter, 3] = 140.0
526 Begin iteration:
527
528 iter = 16
529 cord_individual_obj[indivial_i, :] = [ 0. 10. 130. 140.]
530 cord_individual_obj[indivial_i, :] = [ 1. 12. 206. 218.]
531 cord_individual_obj[indivial_i, :] = [ 2. 10. 192. 202.]
532 cord_individual_obj[indivial_i, :] = [ 3. 12. 271. 283.]
533 cord_individual_obj[indivial_i, :] = [ 4. 12. 195. 207.]
534 cord_individual_obj[indivial_i, :] = [ 5. 14. 172. 186.]
535 cord_individual_obj[indivial_i, :] = [ 6. 9. 162. 171.]
536 cord_individual_obj[indivial_i, :] = [ 7. 10. 178. 188.]
537 cord_individual_obj[indivial_i, :] = [ 8. 10. 143. 153.]
538 cord_individual_obj[indivial_i, :] = [ 9. 10. 245. 255.]
539 cord_individual_obj[indivial_i, :] = [ 10. 11. 187. 198.]
540 cord_individual_obj[indivial_i, :] = [ 11. 12. 251. 263.]
541 cord_individual_obj[indivial_i, :] = [ 12. 12. 155. 167.]
542 cord_individual_obj[indivial_i, :] = [ 13. 12. 199. 211.]
543 cord_individual_obj[indivial_i, :] = [ 14. 10. 216. 226.]
544 cord_individual_obj[indivial_i, :] = [ 15. 11. 253. 264.]
545 cord_individual_obj[indivial_i, :] = [ 16. 10. 224. 234.]
546 cord_individual_obj[indivial_i, :] = [ 17. 13. 177. 190.]
547 cord_individual_obj[indivial_i, :] = [ 18. 10. 153. 163.]
548 cord_individual_obj[indivial_i, :] = [ 19. 10. 189. 199.]
549 cord_individual_obj[indivial_i, :] = [ 20. 10. 200. 210.]
550 cord_individual_obj[indivial_i, :] = [ 21. 11. 230. 241.]
551 cord_individual_obj[indivial_i, :] = [ 22. 10. 216. 226.]
552 cord_individual_obj[indivial_i, :] = [ 23. 12. 179. 191.]
553 cord_individual_obj[indivial_i, :] = [ 24. 10. 137. 147.]
554
555 min(cord_individual_obj[:, 3]) = 140.0
556 histol_G_best_iter[iter, 3] = 140.0
557 Begin iteration:
558
559 iter = 17
560 cord_individual_obj[indivial_i, :] = [ 0. 12. 150. 162.]
561 cord_individual_obj[indivial_i, :] = [ 1. 12. 182. 194.]
562 cord_individual_obj[indivial_i, :] = [ 2. 10. 153. 163.]
563 cord_individual_obj[indivial_i, :] = [ 3. 10. 130. 140.]
564 cord_individual_obj[indivial_i, :] = [ 4. 10. 202. 212.]
565 cord_individual_obj[indivial_i, :] = [ 5. 13. 164. 177.]
566 cord_individual_obj[indivial_i, :] = [ 6. 10. 215. 225.]
567 cord_individual_obj[indivial_i, :] = [ 7. 11. 170. 181.]
568 cord_individual_obj[indivial_i, :] = [ 8. 12. 146. 158.]
569 cord_individual_obj[indivial_i, :] = [ 9. 11. 193. 204.]
570 cord_individual_obj[indivial_i, :] = [ 10. 12. 200. 212.]
571 cord_individual_obj[indivial_i, :] = [ 11. 11. 189. 200.]
572 cord_individual_obj[indivial_i, :] = [ 12. 11. 209. 220.]
573 cord_individual_obj[indivial_i, :] = [ 13. 10. 232. 242.]
574 cord_individual_obj[indivial_i, :] = [ 14. 13. 215. 228.]
575 cord_individual_obj[indivial_i, :] = [ 15. 12. 221. 233.]
576 cord_individual_obj[indivial_i, :] = [ 16. 9. 222. 231.]
577 cord_individual_obj[indivial_i, :] = [ 17. 10. 174. 184.]
578 cord_individual_obj[indivial_i, :] = [ 18. 9. 176. 185.]
579 cord_individual_obj[indivial_i, :] = [ 19. 11. 154. 165.]
580 cord_individual_obj[indivial_i, :] = [ 20. 13. 228. 241.]
581 cord_individual_obj[indivial_i, :] = [ 21. 9. 243. 252.]
582 cord_individual_obj[indivial_i, :] = [ 22. 11. 203. 214.]
583 cord_individual_obj[indivial_i, :] = [ 23. 12. 231. 243.]

```

```

584     cord_individual_obj[indivial_i, :] = [ 24. 11. 193. 204.]
585
586     min(cord_individual_obj[:, 3]) = 140.0
587     historl_G_best_iter[iter, 3] = 140.0
588 Begin iteration:
589
590 iter = 18
591     cord_individual_obj[indivial_i, :] = [ 0. 13. 192. 205.]
592     cord_individual_obj[indivial_i, :] = [ 1. 11. 161. 172.]
593     cord_individual_obj[indivial_i, :] = [ 2. 10. 225. 235.]
594     cord_individual_obj[indivial_i, :] = [ 3. 11. 223. 234.]
595     cord_individual_obj[indivial_i, :] = [ 4. 11. 234. 245.]
596     cord_individual_obj[indivial_i, :] = [ 5. 15. 163. 178.]
597     cord_individual_obj[indivial_i, :] = [ 6. 12. 254. 266.]
598     cord_individual_obj[indivial_i, :] = [ 7. 10. 143. 153.]
599     cord_individual_obj[indivial_i, :] = [ 8. 11. 142. 153.]
600     cord_individual_obj[indivial_i, :] = [ 9. 10. 224. 234.]
601     cord_individual_obj[indivial_i, :] = [ 10. 12. 176. 188.]
602     cord_individual_obj[indivial_i, :] = [ 11. 10. 236. 246.]
603     cord_individual_obj[indivial_i, :] = [ 12. 10. 203. 213.]
604     cord_individual_obj[indivial_i, :] = [ 13. 12. 186. 198.]
605     cord_individual_obj[indivial_i, :] = [ 14. 10. 212. 222.]
606     cord_individual_obj[indivial_i, :] = [ 15. 11. 237. 248.]
607     cord_individual_obj[indivial_i, :] = [ 16. 10. 238. 248.]
608     cord_individual_obj[indivial_i, :] = [ 17. 12. 195. 207.]
609     cord_individual_obj[indivial_i, :] = [ 18. 12. 188. 200.]
610     cord_individual_obj[indivial_i, :] = [ 19. 12. 193. 205.]
611     cord_individual_obj[indivial_i, :] = [ 20. 12. 167. 179.]
612     cord_individual_obj[indivial_i, :] = [ 21. 10. 130. 140.]
613     cord_individual_obj[indivial_i, :] = [ 22. 11. 202. 213.]
614     cord_individual_obj[indivial_i, :] = [ 23. 11. 188. 199.]
615     cord_individual_obj[indivial_i, :] = [ 24. 12. 161. 173.]
616
617     min(cord_individual_obj[:, 3]) = 140.0
618     historl_G_best_iter[iter, 3] = 140.0
619 Begin iteration:
620
621 iter = 19
622     cord_individual_obj[indivial_i, :] = [ 0. 11. 155. 166.]
623     cord_individual_obj[indivial_i, :] = [ 1. 11. 208. 219.]
624     cord_individual_obj[indivial_i, :] = [ 2. 11. 177. 188.]
625     cord_individual_obj[indivial_i, :] = [ 3. 11. 273. 284.]
626     cord_individual_obj[indivial_i, :] = [ 4. 9. 202. 211.]
627     cord_individual_obj[indivial_i, :] = [ 5. 13. 178. 191.]
628     cord_individual_obj[indivial_i, :] = [ 6. 10. 130. 140.]
629     cord_individual_obj[indivial_i, :] = [ 7. 11. 259. 270.]
630     cord_individual_obj[indivial_i, :] = [ 8. 11. 139. 150.]
631     cord_individual_obj[indivial_i, :] = [ 9. 10. 196. 206.]
632     cord_individual_obj[indivial_i, :] = [ 10. 11. 198. 209.]
633     cord_individual_obj[indivial_i, :] = [ 11. 13. 224. 237.]
634     cord_individual_obj[indivial_i, :] = [ 12. 11. 228. 239.]
635     cord_individual_obj[indivial_i, :] = [ 13. 10. 182. 192.]
636     cord_individual_obj[indivial_i, :] = [ 14. 10. 239. 249.]
637     cord_individual_obj[indivial_i, :] = [ 15. 12. 204. 216.]
638     cord_individual_obj[indivial_i, :] = [ 16. 9. 193. 202.]
639     cord_individual_obj[indivial_i, :] = [ 17. 12. 171. 183.]
640     cord_individual_obj[indivial_i, :] = [ 18. 13. 196. 209.]
641     cord_individual_obj[indivial_i, :] = [ 19. 13. 183. 196.]
642     cord_individual_obj[indivial_i, :] = [ 20. 11. 181. 192.]
643     cord_individual_obj[indivial_i, :] = [ 21. 13. 222. 235.]
644     cord_individual_obj[indivial_i, :] = [ 22. 12. 229. 241.]
645     cord_individual_obj[indivial_i, :] = [ 23. 12. 204. 216.]
646     cord_individual_obj[indivial_i, :] = [ 24. 11. 181. 192.]
647
648     min(cord_individual_obj[:, 3]) = 140.0
649     historl_G_best_iter[iter, 3] = 140.0
650 Begin iteration:
651
652 iter = 20
653     cord_individual_obj[indivial_i, :] = [ 0. 12. 155. 167.]
654     cord_individual_obj[indivial_i, :] = [ 1. 11. 185. 196.]
655     cord_individual_obj[indivial_i, :] = [ 2. 12. 245. 257.]
656     cord_individual_obj[indivial_i, :] = [ 3. 10. 130. 140.]
657     cord_individual_obj[indivial_i, :] = [ 4. 9. 202. 211.]
658     cord_individual_obj[indivial_i, :] = [ 5. 13. 173. 186.]
659     cord_individual_obj[indivial_i, :] = [ 6. 9. 188. 197.]
660     cord_individual_obj[indivial_i, :] = [ 7. 10. 137. 147.]
661     cord_individual_obj[indivial_i, :] = [ 8. 10. 157. 167.]
662     cord_individual_obj[indivial_i, :] = [ 9. 10. 187. 197.]
663     cord_individual_obj[indivial_i, :] = [ 10. 11. 190. 201.]
664     cord_individual_obj[indivial_i, :] = [ 11. 11. 148. 159.]
665     cord_individual_obj[indivial_i, :] = [ 12. 11. 204. 215.]
666     cord_individual_obj[indivial_i, :] = [ 13. 11. 224. 235.]
667     cord_individual_obj[indivial_i, :] = [ 14. 11. 199. 210.]

```

```

668 cord_individual_obj[indivial_i,:] = [ 15. 15. 246. 261.]
669 cord_individual_obj[indivial_i,:] = [ 16. 10. 175. 185.]
670 cord_individual_obj[indivial_i,:] = [ 17. 11. 155. 166.]
671 cord_individual_obj[indivial_i,:] = [ 18. 9. 181. 190.]
672 cord_individual_obj[indivial_i,:] = [ 19. 13. 222. 235.]
673 cord_individual_obj[indivial_i,:] = [ 20. 11. 171. 182.]
674 cord_individual_obj[indivial_i,:] = [ 21. 12. 175. 187.]
675 cord_individual_obj[indivial_i,:] = [ 22. 11. 220. 231.]
676 cord_individual_obj[indivial_i,:] = [ 23. 13. 206. 219.]
677 cord_individual_obj[indivial_i,:] = [ 24. 9. 206. 215.]
678
679 min(cord_individual_obj[:, 3]) = 140.0
680 historl_G_best_iter[iter, 3] = 140.0
681 Iteration calculate over
682
683
684
685
686 All item are in Bin and:
687 Bin area = 1080
688 Real_area = 242.0
689 Proportion_of_area = 0.22407407407407406
690 BEST_CHROM =
691 berth: [14.5 8.5 7. 3.5 2.5 27.5 11.5 11.5 4. 27.5 4. 28.5 16.5 22.
692 22. 22.5 22.5 13.5 3. 9. ]
693 time: [6. 7. 6. 8. 6. 5. 3. 2. 2. 3. 4. 0. 0. 2. 4. 0. 1. 0. 0. 0.]
694 num_QC: [3. 3. 4. 3. 2. 1. 4. 6. 4. 2. 3. 2. 1. 4. 4. 3. 4. 3. 5. 4.]
695 Objective function values and some other indicators:
696 Obj0 = 10.00          Obj1 = 130.00         Obj0 + Obj1 = 140.00
697 Total movement of crane: 32.00
698 Total waiting time in berth position: 59.00
699 Total index of q during berthing: 1133.00
700 Specific arrangement for each vessel:
701 V_id: 0      li: 9.0           xi: 14.5           bow of i: 10.0           tail of i: 19.0           gama_i0: 6.0           gama_i1: 8
702 .0          gama_i1 + 1: 9.0       gama_i1 - gama_i0: 2.0           duration_time_i: 3.0           demand_i: 140.0           work
703 load_i: 140.0           work load gap_i: 0
704 V_id: 1      li: 3.0           xi: 8.5           bow of i: 7.0           tail of i: 10.0           gama_i0: 7.0           gama_i1: 9.0
705 .0          gama_i1 + 1: 10.0       gama_i1 - gama_i0: 2.0           duration_time_i: 3.0           demand_i: 160.0           work
706 load_i: 160.0           work load gap_i: 0
707 V_id: 2      li: 4.0           xi: 7.0           bow of i: 5.0           tail of i: 9.0           gama_i0: 6.0           gama_i1: 6.0
708 .0          gama_i1 + 1: 7.0       gama_i1 - gama_i0: 0.0           duration_time_i: 1.0           demand_i: 80.0           work load_i:
709 80.0           work load gap_i: 0
710 V_id: 3      li: 7.0           xi: 3.5           bow of i: 0.0           tail of i: 7.0           gama_i0: 8.0           gama_i1: 10.0
711 .0          gama_i1 + 1: 11.0       gama_i1 - gama_i0: 2.0           duration_time_i: 3.0           demand_i: 140.0           work
712 load_i: 140.0           work load gap_i: 0
713 V_id: 4      li: 5.0           xi: 2.5           bow of i: 0.0           tail of i: 5.0           gama_i0: 6.0           gama_i1: 7.0
714 .0          gama_i1 + 1: 8.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 80.0           work load_i:
715 80.0           work load gap_i: 0
716 V_id: 5      li: 3.0           xi: 27.5           bow of i: 26.0           tail of i: 29.0           gama_i0: 5.0           gama_i1: 8
717 .0          gama_i1 + 1: 9.0       gama_i1 - gama_i0: 3.0           duration_time_i: 4.0           demand_i: 80.0           work
718 load_i: 80.0           work load gap_i: 0
719 V_id: 6      li: 7.0           xi: 11.5           bow of i: 8.0           tail of i: 15.0           gama_i0: 3.0           gama_i1: 4
720 .0          gama_i1 + 1: 5.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 160.0           work
721 load_i: 160.0           work load gap_i: 0
722 V_id: 7      li: 7.0           xi: 11.5           bow of i: 8.0           tail of i: 15.0           gama_i0: 2.0           gama_i1: 2
723 .0          gama_i1 + 1: 3.0       gama_i1 - gama_i0: 0.0           duration_time_i: 1.0           demand_i: 120.0           work
724 load_i: 120.0           work load gap_i: 0
725 V_id: 8      li: 8.0           xi: 4.0           bow of i: 0.0           tail of i: 8.0           gama_i0: 2.0           gama_i1: 3.0
726 .0          gama_i1 + 1: 4.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 100.0           work load_i:
727 100.0           work load gap_i: 0
728 V_id: 9      li: 3.0           xi: 27.5           bow of i: 26.0           tail of i: 29.0           gama_i0: 3.0           gama_i1: 4
729 .0          gama_i1 + 1: 5.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 60.0           work
730 load_i: 60.0           work load gap_i: 0
731 V_id: 10     li: 8.0           xi: 4.0           bow of i: 0.0           tail of i: 8.0           gama_i0: 4.0           gama_i1: 5
732 .0          gama_i1 + 1: 6.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 80.0           work load_i:
733 80.0           work load gap_i: 0
734 V_id: 11     li: 3.0           xi: 28.5           bow of i: 27.0           tail of i: 30.0           gama_i0: 0.0           gama_i1:
735 : 2.0         gama_i1 + 1: 3.0       gama_i1 - gama_i0: 2.0           duration_time_i: 3.0           demand_i: 120.0           work
736 load_i: 120.0           work load gap_i: 0
737 V_id: 12     li: 3.0           xi: 16.5           bow of i: 15.0           tail of i: 18.0           gama_i0: 0.0           gama_i1:
738 : 3.0         gama_i1 + 1: 4.0       gama_i1 - gama_i0: 3.0           duration_time_i: 4.0           demand_i: 80.0           work
739 load_i: 80.0           work load gap_i: 0
740 V_id: 13     li: 8.0           xi: 22.0           bow of i: 18.0           tail of i: 26.0           gama_i0: 2.0           gama_i1:
741 : 3.0         gama_i1 + 1: 4.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 160.0           work
742 load_i: 160.0           work load gap_i: 0
743 V_id: 14     li: 8.0           xi: 22.0           bow of i: 18.0           tail of i: 26.0           gama_i0: 4.0           gama_i1:
744 : 5.0         gama_i1 + 1: 6.0       gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 120.0           work
745 load_i: 120.0           work load gap_i: 0
746 V_id: 15     li: 9.0           xi: 22.5           bow of i: 18.0           tail of i: 27.0           gama_i0: 0.0           gama_i1:
747 : 0.0         gama_i1 + 1: 1.0       gama_i1 - gama_i0: 0.0           duration_time_i: 1.0           demand_i: 60.0           work
748 load_i: 60.0           work load gap_i: 0
749 V_id: 16     li: 9.0           xi: 22.5           bow of i: 18.0           tail of i: 27.0           gama_i0: 1.0           gama_i1:
750 : 1.0         gama_i1 + 1: 2.0       gama_i1 - gama_i0: 0.0           duration_time_i: 1.0           demand_i: 60.0           work
751 load_i: 60.0           work load gap_i: 0

```

unknown

718	V_id: 17 : 0.0 load_i: 60.0	li: 3.0 gama_i1 + 1: 1.0 work load gap_i: 0	xi: 13.5 gama_i1 - gama_i0: 0.0	bow of i: 12.0	tail of i: 15.0 duration_time_i: 1.0	gama_i0: 0.0 demand_i: 60.0	gama_i1 work
719	V_id: 18 140.0	li: 6.0 gama_i1 + 1: 2.0 work load gap_i: 0	xi: 3.0 gama_i1 - gama_i0: 1.0	bow of i: 0.0	tail of i: 6.0 duration_time_i: 2.0	gama_i0: 0.0 demand_i: 140.0	gama_i1: 1.0 work load_i:
720	V_id: 19 .0	li: 6.0 gama_i1 + 1: 2.0 load_i: 120.0	xi: 9.0 gama_i1 - gama_i0: 1.0	bow of i: 6.0	tail of i: 12.0 duration_time_i: 2.0	gama_i0: 0.0 demand_i: 120.0	gama_i1: 1 work

721 722 Algorithm finished and the total CPU time: 527 s

723 End

724