

unknown

```

1 "E:\1_20\3_00000\1_00000\1_0000000\1_0000000_0000\1_LW_00002\6_0000\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=35023
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1_20\3_00000\1_00000\1_0000000\1_0000000_0000\1_LW_00002\6_0000\2 python code\01_My_Python_Code', 'E:/1_20\3_00000\1_00000\1_0000000\1_0000000_0000\1_LW_00002\6_0000\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_20\3_00000\1_00000\1_0000000\1_0000000_0000\1_LW_00002\6_0000\2 python code\01_My_Python_Code/main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1_20\3_00000\1_00000\1_0000000\1_0000000_0000\1_LW_00002\6_0000\2 python code\01_My_Python_Code')
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11 Waiting 1s.....
12
13 This is the R_20_3_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 = 0.10064416235587093
29         r2 = 0.10064416235587093
30 Begin iteration:
31
32 iter = 0
33     cord_individual_obj[individual_i, :] = [ 0. 10. 546. 556.]
34     cord_individual_obj[individual_i, :] = [ 1. 11. 380. 391.]
35     cord_individual_obj[individual_i, :] = [ 2. 10. 361. 371.]
36     cord_individual_obj[individual_i, :] = [ 3. 12. 419. 431.]
37     cord_individual_obj[individual_i, :] = [ 4. 10. 348. 358.]
38     cord_individual_obj[individual_i, :] = [ 5. 11. 330. 341.]
39     cord_individual_obj[individual_i, :] = [ 6. 11. 425. 436.]
40     cord_individual_obj[individual_i, :] = [ 7. 10. 382. 392.]
41     cord_individual_obj[individual_i, :] = [ 8. 10. 435. 445.]
42     cord_individual_obj[individual_i, :] = [ 9. 12. 370. 382.]
43     cord_individual_obj[individual_i, :] = [ 10. 11. 422. 433.]
44     cord_individual_obj[individual_i, :] = [ 11. 12. 371. 383.]
45     cord_individual_obj[individual_i, :] = [ 12. 12. 312. 324.]
46     cord_individual_obj[individual_i, :] = [ 13. 11. 361. 372.]
47     cord_individual_obj[individual_i, :] = [ 14. 12. 272. 284.]
48     cord_individual_obj[individual_i, :] = [ 15. 14. 359. 373.]
49     cord_individual_obj[individual_i, :] = [ 16. 11. 344. 355.]
50     cord_individual_obj[individual_i, :] = [ 17. 12. 366. 378.]
51     cord_individual_obj[individual_i, :] = [ 18. 9. 376. 385.]
52     cord_individual_obj[individual_i, :] = [ 19. 13. 539. 552.]
53     cord_individual_obj[individual_i, :] = [ 20. 9. 470. 479.]
54     cord_individual_obj[individual_i, :] = [ 21. 10. 433. 443.]
55     cord_individual_obj[individual_i, :] = [ 22. 11. 379. 390.]
56     cord_individual_obj[individual_i, :] = [ 23. 10. 329. 339.]
57     cord_individual_obj[individual_i, :] = [ 24. 11. 331. 342.]
58
59 min(cord_individual_obj[:, 3]) = 284.0
60 historl_G_best_iter[iter, 3] = 284.0
61 Begin iteration:
62
63 iter = 1
64     cord_individual_obj[individual_i, :] = [ 0. 12. 272. 284.]
65     cord_individual_obj[individual_i, :] = [ 1. 11. 462. 473.]
66     cord_individual_obj[individual_i, :] = [ 2. 10. 441. 451.]
67     cord_individual_obj[individual_i, :] = [ 3. 12. 357. 369.]
68     cord_individual_obj[individual_i, :] = [ 4. 9. 388. 397.]
69     cord_individual_obj[individual_i, :] = [ 5. 13. 346. 359.]
70     cord_individual_obj[individual_i, :] = [ 6. 10. 351. 361.]
71     cord_individual_obj[individual_i, :] = [ 7. 13. 413. 426.]
72     cord_individual_obj[individual_i, :] = [ 8. 9. 376. 385.]
73     cord_individual_obj[individual_i, :] = [ 9. 11. 410. 421.]
74     cord_individual_obj[individual_i, :] = [ 10. 12. 413. 425.]
75     cord_individual_obj[individual_i, :] = [ 11. 10. 344. 354.]
76     cord_individual_obj[individual_i, :] = [ 12. 13. 322. 335.]
77     cord_individual_obj[individual_i, :] = [ 13. 12. 455. 467.]
78     cord_individual_obj[individual_i, :] = [ 14. 12. 420. 432.]
79     cord_individual_obj[individual_i, :] = [ 15. 11. 301. 312.]

```

```

80 cord_individual_obj[indivial_i,:] = [ 16. 10. 270. 280.]
81 cord_individual_obj[indivial_i,:] = [ 17. 11. 377. 388.]
82 cord_individual_obj[indivial_i,:] = [ 18. 13. 488. 501.]
83 cord_individual_obj[indivial_i,:] = [ 19. 10. 423. 433.]
84 cord_individual_obj[indivial_i,:] = [ 20. 11. 406. 417.]
85 cord_individual_obj[indivial_i,:] = [ 21. 12. 396. 408.]
86 cord_individual_obj[indivial_i,:] = [ 22. 11. 501. 512.]
87 cord_individual_obj[indivial_i,:] = [ 23. 11. 381. 392.]
88 cord_individual_obj[indivial_i,:] = [ 24. 10. 325. 335.]
89
90 min(cord_individual_obj[:,3]) = 280.0
91 historl_G_best_iter[iter, 3] = 280.0
92 Begin iteration:
93
94 iter = 2
95 cord_individual_obj[indivial_i,:] = [ 0. 10. 274. 284.]
96 cord_individual_obj[indivial_i,:] = [ 1. 11. 359. 370.]
97 cord_individual_obj[indivial_i,:] = [ 2. 14. 388. 402.]
98 cord_individual_obj[indivial_i,:] = [ 3. 11. 315. 326.]
99 cord_individual_obj[indivial_i,:] = [ 4. 11. 304. 315.]
100 cord_individual_obj[indivial_i,:] = [ 5. 13. 367. 380.]
101 cord_individual_obj[indivial_i,:] = [ 6. 11. 316. 327.]
102 cord_individual_obj[indivial_i,:] = [ 7. 11. 400. 411.]
103 cord_individual_obj[indivial_i,:] = [ 8. 10. 345. 355.]
104 cord_individual_obj[indivial_i,:] = [ 9. 13. 275. 288.]
105 cord_individual_obj[indivial_i,:] = [ 10. 12. 297. 309.]
106 cord_individual_obj[indivial_i,:] = [ 11. 12. 307. 319.]
107 cord_individual_obj[indivial_i,:] = [ 12. 9. 318. 327.]
108 cord_individual_obj[indivial_i,:] = [ 13. 12. 273. 285.]
109 cord_individual_obj[indivial_i,:] = [ 14. 12. 356. 368.]
110 cord_individual_obj[indivial_i,:] = [ 15. 14. 367. 381.]
111 cord_individual_obj[indivial_i,:] = [ 16. 12. 319. 331.]
112 cord_individual_obj[indivial_i,:] = [ 17. 11. 347. 358.]
113 cord_individual_obj[indivial_i,:] = [ 18. 10. 346. 356.]
114 cord_individual_obj[indivial_i,:] = [ 19. 12. 414. 426.]
115 cord_individual_obj[indivial_i,:] = [ 20. 11. 363. 374.]
116 cord_individual_obj[indivial_i,:] = [ 21. 11. 371. 382.]
117 cord_individual_obj[indivial_i,:] = [ 22. 10. 270. 280.]
118 cord_individual_obj[indivial_i,:] = [ 23. 14. 335. 349.]
119 cord_individual_obj[indivial_i,:] = [ 24. 12. 348. 360.]
120
121 min(cord_individual_obj[:,3]) = 280.0
122 historl_G_best_iter[iter, 3] = 280.0
123 Begin iteration:
124
125 iter = 3
126 cord_individual_obj[indivial_i,:] = [ 0. 9. 277. 286.]
127 cord_individual_obj[indivial_i,:] = [ 1. 11. 361. 372.]
128 cord_individual_obj[indivial_i,:] = [ 2. 11. 404. 415.]
129 cord_individual_obj[indivial_i,:] = [ 3. 8. 279. 287.]
130 cord_individual_obj[indivial_i,:] = [ 4. 11. 306. 317.]
131 cord_individual_obj[indivial_i,:] = [ 5. 12. 366. 378.]
132 cord_individual_obj[indivial_i,:] = [ 6. 13. 275. 288.]
133 cord_individual_obj[indivial_i,:] = [ 7. 12. 314. 326.]
134 cord_individual_obj[indivial_i,:] = [ 8. 11. 270. 281.]
135 cord_individual_obj[indivial_i,:] = [ 9. 10. 243. 253.]
136 cord_individual_obj[indivial_i,:] = [ 10. 10. 327. 337.]
137 cord_individual_obj[indivial_i,:] = [ 11. 11. 277. 288.]
138 cord_individual_obj[indivial_i,:] = [ 12. 10. 310. 320.]
139 cord_individual_obj[indivial_i,:] = [ 13. 11. 320. 331.]
140 cord_individual_obj[indivial_i,:] = [ 14. 11. 316. 327.]
141 cord_individual_obj[indivial_i,:] = [ 15. 10. 336. 346.]
142 cord_individual_obj[indivial_i,:] = [ 16. 10. 317. 327.]
143 cord_individual_obj[indivial_i,:] = [ 17. 11. 298. 309.]
144 cord_individual_obj[indivial_i,:] = [ 18. 13. 325. 338.]
145 cord_individual_obj[indivial_i,:] = [ 19. 10. 270. 280.]
146 cord_individual_obj[indivial_i,:] = [ 20. 12. 316. 328.]
147 cord_individual_obj[indivial_i,:] = [ 21. 11. 238. 249.]
148 cord_individual_obj[indivial_i,:] = [ 22. 13. 376. 389.]
149 cord_individual_obj[indivial_i,:] = [ 23. 12. 262. 274.]
150 cord_individual_obj[indivial_i,:] = [ 24. 10. 335. 345.]
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. 11. 321. 332.]
158 cord_individual_obj[indivial_i,:] = [ 1. 12. 349. 361.]
159 cord_individual_obj[indivial_i,:] = [ 2. 11. 238. 249.]
160 cord_individual_obj[indivial_i,:] = [ 3. 9. 370. 379.]
161 cord_individual_obj[indivial_i,:] = [ 4. 11. 330. 341.]
162 cord_individual_obj[indivial_i,:] = [ 5. 12. 320. 332.]
163 cord_individual_obj[indivial_i,:] = [ 6. 12. 358. 370.]

```

```

164 cord_individual_obj[indivial_i, :] = [ 7. 12. 349. 361.]
165 cord_individual_obj[indivial_i, :] = [ 8. 11. 452. 463.]
166 cord_individual_obj[indivial_i, :] = [ 9. 10. 273. 283.]
167 cord_individual_obj[indivial_i, :] = [ 10. 11. 298. 309.]
168 cord_individual_obj[indivial_i, :] = [ 11. 10. 289. 299.]
169 cord_individual_obj[indivial_i, :] = [ 12. 9. 277. 286.]
170 cord_individual_obj[indivial_i, :] = [ 13. 14. 364. 378.]
171 cord_individual_obj[indivial_i, :] = [ 14. 11. 269. 280.]
172 cord_individual_obj[indivial_i, :] = [ 15. 13. 327. 340.]
173 cord_individual_obj[indivial_i, :] = [ 16. 11. 359. 370.]
174 cord_individual_obj[indivial_i, :] = [ 17. 13. 380. 393.]
175 cord_individual_obj[indivial_i, :] = [ 18. 13. 301. 314.]
176 cord_individual_obj[indivial_i, :] = [ 19. 11. 305. 316.]
177 cord_individual_obj[indivial_i, :] = [ 20. 12. 351. 363.]
178 cord_individual_obj[indivial_i, :] = [ 21. 11. 332. 343.]
179 cord_individual_obj[indivial_i, :] = [ 22. 10. 407. 417.]
180 cord_individual_obj[indivial_i, :] = [ 23. 10. 279. 289.]
181 cord_individual_obj[indivial_i, :] = [ 24. 11. 334. 345.]
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. 336. 348.]
189 cord_individual_obj[indivial_i, :] = [ 1. 14. 324. 338.]
190 cord_individual_obj[indivial_i, :] = [ 2. 13. 375. 388.]
191 cord_individual_obj[indivial_i, :] = [ 3. 11. 426. 437.]
192 cord_individual_obj[indivial_i, :] = [ 4. 13. 305. 318.]
193 cord_individual_obj[indivial_i, :] = [ 5. 9. 400. 409.]
194 cord_individual_obj[indivial_i, :] = [ 6. 13. 308. 321.]
195 cord_individual_obj[indivial_i, :] = [ 7. 13. 281. 294.]
196 cord_individual_obj[indivial_i, :] = [ 8. 11. 238. 249.]
197 cord_individual_obj[indivial_i, :] = [ 9. 12. 274. 286.]
198 cord_individual_obj[indivial_i, :] = [ 10. 10. 332. 342.]
199 cord_individual_obj[indivial_i, :] = [ 11. 15. 348. 363.]
200 cord_individual_obj[indivial_i, :] = [ 12. 10. 317. 327.]
201 cord_individual_obj[indivial_i, :] = [ 13. 11. 339. 350.]
202 cord_individual_obj[indivial_i, :] = [ 14. 11. 354. 365.]
203 cord_individual_obj[indivial_i, :] = [ 15. 12. 301. 313.]
204 cord_individual_obj[indivial_i, :] = [ 16. 10. 330. 340.]
205 cord_individual_obj[indivial_i, :] = [ 17. 14. 297. 311.]
206 cord_individual_obj[indivial_i, :] = [ 18. 12. 311. 323.]
207 cord_individual_obj[indivial_i, :] = [ 19. 12. 283. 295.]
208 cord_individual_obj[indivial_i, :] = [ 20. 12. 340. 352.]
209 cord_individual_obj[indivial_i, :] = [ 21. 11. 303. 314.]
210 cord_individual_obj[indivial_i, :] = [ 22. 12. 322. 334.]
211 cord_individual_obj[indivial_i, :] = [ 23. 11. 286. 297.]
212 cord_individual_obj[indivial_i, :] = [ 24. 11. 310. 321.]
213
214 min(cord_individual_obj[:, 3]) = 249.0
215 historl_G_best_iter[iter, 3] = 249.0
216 Begin iteration:
217
218 iter = 6
219 cord_individual_obj[indivial_i, :] = [ 0. 12. 315. 327.]
220 cord_individual_obj[indivial_i, :] = [ 1. 10. 302. 312.]
221 cord_individual_obj[indivial_i, :] = [ 2. 12. 375. 387.]
222 cord_individual_obj[indivial_i, :] = [ 3. 11. 238. 249.]
223 cord_individual_obj[indivial_i, :] = [ 4. 13. 387. 400.]
224 cord_individual_obj[indivial_i, :] = [ 5. 12. 406. 418.]
225 cord_individual_obj[indivial_i, :] = [ 6. 12. 282. 294.]
226 cord_individual_obj[indivial_i, :] = [ 7. 11. 377. 388.]
227 cord_individual_obj[indivial_i, :] = [ 8. 10. 348. 358.]
228 cord_individual_obj[indivial_i, :] = [ 9. 9. 275. 284.]
229 cord_individual_obj[indivial_i, :] = [ 10. 11. 338. 349.]
230 cord_individual_obj[indivial_i, :] = [ 11. 11. 313. 324.]
231 cord_individual_obj[indivial_i, :] = [ 12. 10. 298. 308.]
232 cord_individual_obj[indivial_i, :] = [ 13. 10. 308. 318.]
233 cord_individual_obj[indivial_i, :] = [ 14. 13. 342. 355.]
234 cord_individual_obj[indivial_i, :] = [ 15. 11. 269. 280.]
235 cord_individual_obj[indivial_i, :] = [ 16. 11. 290. 301.]
236 cord_individual_obj[indivial_i, :] = [ 17. 12. 380. 392.]
237 cord_individual_obj[indivial_i, :] = [ 18. 13. 374. 387.]
238 cord_individual_obj[indivial_i, :] = [ 19. 13. 352. 365.]
239 cord_individual_obj[indivial_i, :] = [ 20. 13. 384. 397.]
240 cord_individual_obj[indivial_i, :] = [ 21. 10. 248. 258.]
241 cord_individual_obj[indivial_i, :] = [ 22. 11. 397. 408.]
242 cord_individual_obj[indivial_i, :] = [ 23. 11. 324. 335.]
243 cord_individual_obj[indivial_i, :] = [ 24. 11. 349. 360.]
244
245 min(cord_individual_obj[:, 3]) = 249.0
246 historl_G_best_iter[iter, 3] = 249.0
247 Begin iteration:

```

```

248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [ 0. 12. 409. 421.]
251 cord_individual_obj[indivial_i, :] = [ 1. 11. 346. 357.]
252 cord_individual_obj[indivial_i, :] = [ 2. 11. 380. 391.]
253 cord_individual_obj[indivial_i, :] = [ 3. 10. 306. 316.]
254 cord_individual_obj[indivial_i, :] = [ 4. 11. 357. 368.]
255 cord_individual_obj[indivial_i, :] = [ 5. 11. 238. 249.]
256 cord_individual_obj[indivial_i, :] = [ 6. 12. 389. 401.]
257 cord_individual_obj[indivial_i, :] = [ 7. 15. 386. 401.]
258 cord_individual_obj[indivial_i, :] = [ 8. 12. 380. 392.]
259 cord_individual_obj[indivial_i, :] = [ 9. 10. 379. 389.]
260 cord_individual_obj[indivial_i, :] = [ 10. 12. 344. 356.]
261 cord_individual_obj[indivial_i, :] = [ 11. 12. 430. 442.]
262 cord_individual_obj[indivial_i, :] = [ 12. 12. 365. 377.]
263 cord_individual_obj[indivial_i, :] = [ 13. 15. 480. 495.]
264 cord_individual_obj[indivial_i, :] = [ 14. 14. 396. 410.]
265 cord_individual_obj[indivial_i, :] = [ 15. 12. 340. 352.]
266 cord_individual_obj[indivial_i, :] = [ 16. 14. 426. 440.]
267 cord_individual_obj[indivial_i, :] = [ 17. 13. 383. 396.]
268 cord_individual_obj[indivial_i, :] = [ 18. 13. 348. 361.]
269 cord_individual_obj[indivial_i, :] = [ 19. 13. 389. 402.]
270 cord_individual_obj[indivial_i, :] = [ 20. 13. 341. 354.]
271 cord_individual_obj[indivial_i, :] = [ 21. 13. 318. 331.]
272 cord_individual_obj[indivial_i, :] = [ 22. 13. 428. 441.]
273 cord_individual_obj[indivial_i, :] = [ 23. 10. 402. 412.]
274 cord_individual_obj[indivial_i, :] = [ 24. 13. 337. 350.]
275
276 min(cord_individual_obj[:, 3]) = 249.0
277 historl_G_best_iter[iter, 3] = 249.0
278 Begin iteration:
279
280 iter = 8
281 cord_individual_obj[indivial_i, :] = [ 0. 10. 326. 336.]
282 cord_individual_obj[indivial_i, :] = [ 1. 13. 333. 346.]
283 cord_individual_obj[indivial_i, :] = [ 2. 10. 397. 407.]
284 cord_individual_obj[indivial_i, :] = [ 3. 11. 244. 255.]
285 cord_individual_obj[indivial_i, :] = [ 4. 14. 326. 340.]
286 cord_individual_obj[indivial_i, :] = [ 5. 14. 357. 371.]
287 cord_individual_obj[indivial_i, :] = [ 6. 12. 318. 330.]
288 cord_individual_obj[indivial_i, :] = [ 7. 13. 384. 397.]
289 cord_individual_obj[indivial_i, :] = [ 8. 14. 308. 322.]
290 cord_individual_obj[indivial_i, :] = [ 9. 11. 394. 405.]
291 cord_individual_obj[indivial_i, :] = [ 10. 11. 291. 302.]
292 cord_individual_obj[indivial_i, :] = [ 11. 11. 331. 342.]
293 cord_individual_obj[indivial_i, :] = [ 12. 10. 387. 397.]
294 cord_individual_obj[indivial_i, :] = [ 13. 11. 238. 249.]
295 cord_individual_obj[indivial_i, :] = [ 14. 12. 380. 392.]
296 cord_individual_obj[indivial_i, :] = [ 15. 10. 253. 263.]
297 cord_individual_obj[indivial_i, :] = [ 16. 11. 341. 352.]
298 cord_individual_obj[indivial_i, :] = [ 17. 12. 302. 314.]
299 cord_individual_obj[indivial_i, :] = [ 18. 11. 361. 372.]
300 cord_individual_obj[indivial_i, :] = [ 19. 14. 433. 447.]
301 cord_individual_obj[indivial_i, :] = [ 20. 14. 371. 385.]
302 cord_individual_obj[indivial_i, :] = [ 21. 11. 278. 289.]
303 cord_individual_obj[indivial_i, :] = [ 22. 9. 342. 351.]
304 cord_individual_obj[indivial_i, :] = [ 23. 11. 319. 330.]
305 cord_individual_obj[indivial_i, :] = [ 24. 11. 363. 374.]
306
307 min(cord_individual_obj[:, 3]) = 249.0
308 historl_G_best_iter[iter, 3] = 249.0
309 Begin iteration:
310
311 iter = 9
312 cord_individual_obj[indivial_i, :] = [ 0. 12. 291. 303.]
313 cord_individual_obj[indivial_i, :] = [ 1. 11. 409. 420.]
314 cord_individual_obj[indivial_i, :] = [ 2. 12. 306. 318.]
315 cord_individual_obj[indivial_i, :] = [ 3. 11. 388. 399.]
316 cord_individual_obj[indivial_i, :] = [ 4. 9. 330. 339.]
317 cord_individual_obj[indivial_i, :] = [ 5. 12. 360. 372.]
318 cord_individual_obj[indivial_i, :] = [ 6. 13. 365. 378.]
319 cord_individual_obj[indivial_i, :] = [ 7. 10. 389. 399.]
320 cord_individual_obj[indivial_i, :] = [ 8. 13. 383. 396.]
321 cord_individual_obj[indivial_i, :] = [ 9. 10. 378. 388.]
322 cord_individual_obj[indivial_i, :] = [ 10. 13. 401. 414.]
323 cord_individual_obj[indivial_i, :] = [ 11. 11. 307. 318.]
324 cord_individual_obj[indivial_i, :] = [ 12. 12. 437. 449.]
325 cord_individual_obj[indivial_i, :] = [ 13. 11. 343. 354.]
326 cord_individual_obj[indivial_i, :] = [ 14. 11. 284. 295.]
327 cord_individual_obj[indivial_i, :] = [ 15. 14. 311. 325.]
328 cord_individual_obj[indivial_i, :] = [ 16. 14. 421. 435.]
329 cord_individual_obj[indivial_i, :] = [ 17. 10. 271. 281.]
330 cord_individual_obj[indivial_i, :] = [ 18. 12. 352. 364.]
331 cord_individual_obj[indivial_i, :] = [ 19. 11. 238. 249.]

```

```

332 cord_individual_obj[indivial_i, :] = [ 20. 13. 457. 470.]
333 cord_individual_obj[indivial_i, :] = [ 21. 11. 292. 303.]
334 cord_individual_obj[indivial_i, :] = [ 22. 11. 377. 388.]
335 cord_individual_obj[indivial_i, :] = [ 23. 12. 249. 261.]
336 cord_individual_obj[indivial_i, :] = [ 24. 12. 300. 312.]
337
338 min(cord_individual_obj[:, 3]) = 249.0
339 histol_G_best_iter[iter, 3] = 249.0
340 Begin iteration:
341
342 iter = 10
343 cord_individual_obj[indivial_i, :] = [ 0. 14. 394. 408.]
344 cord_individual_obj[indivial_i, :] = [ 1. 12. 323. 335.]
345 cord_individual_obj[indivial_i, :] = [ 2. 11. 364. 375.]
346 cord_individual_obj[indivial_i, :] = [ 3. 10. 284. 294.]
347 cord_individual_obj[indivial_i, :] = [ 4. 12. 340. 352.]
348 cord_individual_obj[indivial_i, :] = [ 5. 11. 410. 421.]
349 cord_individual_obj[indivial_i, :] = [ 6. 13. 386. 399.]
350 cord_individual_obj[indivial_i, :] = [ 7. 13. 327. 340.]
351 cord_individual_obj[indivial_i, :] = [ 8. 12. 316. 328.]
352 cord_individual_obj[indivial_i, :] = [ 9. 12. 342. 354.]
353 cord_individual_obj[indivial_i, :] = [ 10. 10. 362. 372.]
354 cord_individual_obj[indivial_i, :] = [ 11. 14. 389. 403.]
355 cord_individual_obj[indivial_i, :] = [ 12. 10. 307. 317.]
356 cord_individual_obj[indivial_i, :] = [ 13. 10. 327. 337.]
357 cord_individual_obj[indivial_i, :] = [ 14. 11. 330. 341.]
358 cord_individual_obj[indivial_i, :] = [ 15. 14. 301. 315.]
359 cord_individual_obj[indivial_i, :] = [ 16. 11. 303. 314.]
360 cord_individual_obj[indivial_i, :] = [ 17. 9. 305. 314.]
361 cord_individual_obj[indivial_i, :] = [ 18. 10. 326. 336.]
362 cord_individual_obj[indivial_i, :] = [ 19. 14. 303. 317.]
363 cord_individual_obj[indivial_i, :] = [ 20. 11. 238. 249.]
364 cord_individual_obj[indivial_i, :] = [ 21. 11. 376. 387.]
365 cord_individual_obj[indivial_i, :] = [ 22. 13. 391. 404.]
366 cord_individual_obj[indivial_i, :] = [ 23. 10. 337. 347.]
367 cord_individual_obj[indivial_i, :] = [ 24. 14. 381. 395.]
368
369 min(cord_individual_obj[:, 3]) = 249.0
370 histol_G_best_iter[iter, 3] = 249.0
371 Begin iteration:
372
373 iter = 11
374 cord_individual_obj[indivial_i, :] = [ 0. 14. 374. 388.]
375 cord_individual_obj[indivial_i, :] = [ 1. 12. 283. 295.]
376 cord_individual_obj[indivial_i, :] = [ 2. 10. 272. 282.]
377 cord_individual_obj[indivial_i, :] = [ 3. 10. 385. 395.]
378 cord_individual_obj[indivial_i, :] = [ 4. 13. 290. 303.]
379 cord_individual_obj[indivial_i, :] = [ 5. 11. 238. 249.]
380 cord_individual_obj[indivial_i, :] = [ 6. 11. 351. 362.]
381 cord_individual_obj[indivial_i, :] = [ 7. 13. 417. 430.]
382 cord_individual_obj[indivial_i, :] = [ 8. 12. 424. 436.]
383 cord_individual_obj[indivial_i, :] = [ 9. 11. 312. 323.]
384 cord_individual_obj[indivial_i, :] = [ 10. 11. 361. 372.]
385 cord_individual_obj[indivial_i, :] = [ 11. 11. 354. 365.]
386 cord_individual_obj[indivial_i, :] = [ 12. 11. 387. 398.]
387 cord_individual_obj[indivial_i, :] = [ 13. 11. 452. 463.]
388 cord_individual_obj[indivial_i, :] = [ 14. 15. 506. 521.]
389 cord_individual_obj[indivial_i, :] = [ 15. 11. 344. 355.]
390 cord_individual_obj[indivial_i, :] = [ 16. 14. 295. 309.]
391 cord_individual_obj[indivial_i, :] = [ 17. 11. 377. 388.]
392 cord_individual_obj[indivial_i, :] = [ 18. 11. 420. 431.]
393 cord_individual_obj[indivial_i, :] = [ 19. 12. 437. 449.]
394 cord_individual_obj[indivial_i, :] = [ 20. 12. 309. 321.]
395 cord_individual_obj[indivial_i, :] = [ 21. 12. 412. 424.]
396 cord_individual_obj[indivial_i, :] = [ 22. 11. 392. 403.]
397 cord_individual_obj[indivial_i, :] = [ 23. 11. 351. 362.]
398 cord_individual_obj[indivial_i, :] = [ 24. 12. 342. 354.]
399
400 min(cord_individual_obj[:, 3]) = 249.0
401 histol_G_best_iter[iter, 3] = 249.0
402 Begin iteration:
403
404 iter = 12
405 cord_individual_obj[indivial_i, :] = [ 0. 14. 376. 390.]
406 cord_individual_obj[indivial_i, :] = [ 1. 12. 349. 361.]
407 cord_individual_obj[indivial_i, :] = [ 2. 11. 332. 343.]
408 cord_individual_obj[indivial_i, :] = [ 3. 14. 356. 370.]
409 cord_individual_obj[indivial_i, :] = [ 4. 13. 437. 450.]
410 cord_individual_obj[indivial_i, :] = [ 5. 11. 322. 333.]
411 cord_individual_obj[indivial_i, :] = [ 6. 10. 400. 410.]
412 cord_individual_obj[indivial_i, :] = [ 7. 11. 374. 385.]
413 cord_individual_obj[indivial_i, :] = [ 8. 11. 406. 417.]
414 cord_individual_obj[indivial_i, :] = [ 9. 10. 364. 374.]
415 cord_individual_obj[indivial_i, :] = [ 10. 11. 366. 377.]

```

```

416 cord_individual_obj[indivial_i,:] = [ 11. 11. 404. 415.]
417 cord_individual_obj[indivial_i,:] = [ 12. 10. 306. 316.]
418 cord_individual_obj[indivial_i,:] = [ 13. 10. 343. 353.]
419 cord_individual_obj[indivial_i,:] = [ 14. 11. 238. 249.]
420 cord_individual_obj[indivial_i,:] = [ 15. 11. 366. 377.]
421 cord_individual_obj[indivial_i,:] = [ 16. 13. 385. 398.]
422 cord_individual_obj[indivial_i,:] = [ 17. 11. 354. 365.]
423 cord_individual_obj[indivial_i,:] = [ 18. 12. 356. 368.]
424 cord_individual_obj[indivial_i,:] = [ 19. 14. 364. 378.]
425 cord_individual_obj[indivial_i,:] = [ 20. 11. 328. 339.]
426 cord_individual_obj[indivial_i,:] = [ 21. 11. 399. 410.]
427 cord_individual_obj[indivial_i,:] = [ 22. 12. 374. 386.]
428 cord_individual_obj[indivial_i,:] = [ 23. 13. 344. 357.]
429 cord_individual_obj[indivial_i,:] = [ 24. 14. 367. 381.]
430
431 min(cord_individual_obj[:,3]) = 249.0
432 histol_G_best_iter[iter,3] = 249.0
433 Begin iteration:
434
435 iter = 13
436 cord_individual_obj[indivial_i,:] = [ 0. 12. 349. 361.]
437 cord_individual_obj[indivial_i,:] = [ 1. 11. 332. 343.]
438 cord_individual_obj[indivial_i,:] = [ 2. 10. 268. 278.]
439 cord_individual_obj[indivial_i,:] = [ 3. 10. 297. 307.]
440 cord_individual_obj[indivial_i,:] = [ 4. 11. 238. 249.]
441 cord_individual_obj[indivial_i,:] = [ 5. 10. 345. 355.]
442 cord_individual_obj[indivial_i,:] = [ 6. 11. 372. 383.]
443 cord_individual_obj[indivial_i,:] = [ 7. 11. 307. 318.]
444 cord_individual_obj[indivial_i,:] = [ 8. 11. 353. 364.]
445 cord_individual_obj[indivial_i,:] = [ 9. 11. 315. 326.]
446 cord_individual_obj[indivial_i,:] = [ 10. 12. 277. 289.]
447 cord_individual_obj[indivial_i,:] = [ 11. 10. 308. 318.]
448 cord_individual_obj[indivial_i,:] = [ 12. 11. 331. 342.]
449 cord_individual_obj[indivial_i,:] = [ 13. 12. 557. 569.]
450 cord_individual_obj[indivial_i,:] = [ 14. 12. 350. 362.]
451 cord_individual_obj[indivial_i,:] = [ 15. 13. 387. 400.]
452 cord_individual_obj[indivial_i,:] = [ 16. 11. 475. 486.]
453 cord_individual_obj[indivial_i,:] = [ 17. 14. 414. 428.]
454 cord_individual_obj[indivial_i,:] = [ 18. 10. 336. 346.]
455 cord_individual_obj[indivial_i,:] = [ 19. 13. 312. 325.]
456 cord_individual_obj[indivial_i,:] = [ 20. 11. 290. 301.]
457 cord_individual_obj[indivial_i,:] = [ 21. 9. 475. 484.]
458 cord_individual_obj[indivial_i,:] = [ 22. 11. 370. 381.]
459 cord_individual_obj[indivial_i,:] = [ 23. 11. 320. 331.]
460 cord_individual_obj[indivial_i,:] = [ 24. 11. 432. 443.]
461
462 min(cord_individual_obj[:,3]) = 249.0
463 histol_G_best_iter[iter,3] = 249.0
464 Begin iteration:
465
466 iter = 14
467 cord_individual_obj[indivial_i,:] = [ 0. 15. 323. 338.]
468 cord_individual_obj[indivial_i,:] = [ 1. 12. 324. 336.]
469 cord_individual_obj[indivial_i,:] = [ 2. 11. 307. 318.]
470 cord_individual_obj[indivial_i,:] = [ 3. 10. 284. 294.]
471 cord_individual_obj[indivial_i,:] = [ 4. 12. 302. 314.]
472 cord_individual_obj[indivial_i,:] = [ 5. 11. 351. 362.]
473 cord_individual_obj[indivial_i,:] = [ 6. 13. 332. 345.]
474 cord_individual_obj[indivial_i,:] = [ 7. 13. 312. 325.]
475 cord_individual_obj[indivial_i,:] = [ 8. 12. 391. 403.]
476 cord_individual_obj[indivial_i,:] = [ 9. 12. 321. 333.]
477 cord_individual_obj[indivial_i,:] = [ 10. 12. 306. 318.]
478 cord_individual_obj[indivial_i,:] = [ 11. 10. 375. 385.]
479 cord_individual_obj[indivial_i,:] = [ 12. 11. 331. 342.]
480 cord_individual_obj[indivial_i,:] = [ 13. 11. 238. 249.]
481 cord_individual_obj[indivial_i,:] = [ 14. 11. 342. 353.]
482 cord_individual_obj[indivial_i,:] = [ 15. 12. 378. 390.]
483 cord_individual_obj[indivial_i,:] = [ 16. 11. 328. 339.]
484 cord_individual_obj[indivial_i,:] = [ 17. 11. 331. 342.]
485 cord_individual_obj[indivial_i,:] = [ 18. 13. 371. 384.]
486 cord_individual_obj[indivial_i,:] = [ 19. 13. 334. 347.]
487 cord_individual_obj[indivial_i,:] = [ 20. 14. 358. 372.]
488 cord_individual_obj[indivial_i,:] = [ 21. 11. 324. 335.]
489 cord_individual_obj[indivial_i,:] = [ 22. 11. 331. 342.]
490 cord_individual_obj[indivial_i,:] = [ 23. 12. 327. 339.]
491 cord_individual_obj[indivial_i,:] = [ 24. 15. 391. 406.]
492
493 min(cord_individual_obj[:,3]) = 249.0
494 histol_G_best_iter[iter,3] = 249.0
495 Begin iteration:
496
497 iter = 15
498 cord_individual_obj[indivial_i,:] = [ 0. 11. 392. 403.]
499 cord_individual_obj[indivial_i,:] = [ 1. 12. 368. 380.]

```

```

500 cord_individual_obj[indivial_i, :] = [ 2. 10. 319. 329.]
501 cord_individual_obj[indivial_i, :] = [ 3. 9. 220. 229.]
502 cord_individual_obj[indivial_i, :] = [ 4. 11. 288. 299.]
503 cord_individual_obj[indivial_i, :] = [ 5. 14. 467. 481.]
504 cord_individual_obj[indivial_i, :] = [ 6. 12. 291. 303.]
505 cord_individual_obj[indivial_i, :] = [ 7. 10. 377. 387.]
506 cord_individual_obj[indivial_i, :] = [ 8. 12. 319. 331.]
507 cord_individual_obj[indivial_i, :] = [ 9. 11. 276. 287.]
508 cord_individual_obj[indivial_i, :] = [ 10. 12. 281. 293.]
509 cord_individual_obj[indivial_i, :] = [ 11. 14. 352. 366.]
510 cord_individual_obj[indivial_i, :] = [ 12. 12. 416. 428.]
511 cord_individual_obj[indivial_i, :] = [ 13. 10. 316. 326.]
512 cord_individual_obj[indivial_i, :] = [ 14. 13. 385. 398.]
513 cord_individual_obj[indivial_i, :] = [ 15. 10. 232. 242.]
514 cord_individual_obj[indivial_i, :] = [ 16. 10. 255. 265.]
515 cord_individual_obj[indivial_i, :] = [ 17. 12. 315. 327.]
516 cord_individual_obj[indivial_i, :] = [ 18. 15. 417. 432.]
517 cord_individual_obj[indivial_i, :] = [ 19. 15. 334. 349.]
518 cord_individual_obj[indivial_i, :] = [ 20. 14. 372. 386.]
519 cord_individual_obj[indivial_i, :] = [ 21. 11. 370. 381.]
520 cord_individual_obj[indivial_i, :] = [ 22. 10. 336. 346.]
521 cord_individual_obj[indivial_i, :] = [ 23. 11. 344. 355.]
522 cord_individual_obj[indivial_i, :] = [ 24. 11. 238. 249.]
523
524 min(cord_individual_obj[:, 3]) = 229.0
525 histol_G_best_iter[iter, 3] = 229.0
526 Begin iteration:
527
528 iter = 16
529 cord_individual_obj[indivial_i, :] = [ 0. 11. 201. 212.]
530 cord_individual_obj[indivial_i, :] = [ 1. 13. 268. 281.]
531 cord_individual_obj[indivial_i, :] = [ 2. 12. 263. 275.]
532 cord_individual_obj[indivial_i, :] = [ 3. 11. 215. 226.]
533 cord_individual_obj[indivial_i, :] = [ 4. 10. 232. 242.]
534 cord_individual_obj[indivial_i, :] = [ 5. 9. 220. 229.]
535 cord_individual_obj[indivial_i, :] = [ 6. 11. 278. 289.]
536 cord_individual_obj[indivial_i, :] = [ 7. 11. 310. 321.]
537 cord_individual_obj[indivial_i, :] = [ 8. 12. 228. 240.]
538 cord_individual_obj[indivial_i, :] = [ 9. 10. 281. 291.]
539 cord_individual_obj[indivial_i, :] = [ 10. 13. 271. 284.]
540 cord_individual_obj[indivial_i, :] = [ 11. 9. 267. 276.]
541 cord_individual_obj[indivial_i, :] = [ 12. 10. 335. 345.]
542 cord_individual_obj[indivial_i, :] = [ 13. 9. 270. 279.]
543 cord_individual_obj[indivial_i, :] = [ 14. 12. 236. 248.]
544 cord_individual_obj[indivial_i, :] = [ 15. 11. 218. 229.]
545 cord_individual_obj[indivial_i, :] = [ 16. 12. 281. 293.]
546 cord_individual_obj[indivial_i, :] = [ 17. 11. 220. 231.]
547 cord_individual_obj[indivial_i, :] = [ 18. 11. 217. 228.]
548 cord_individual_obj[indivial_i, :] = [ 19. 11. 297. 308.]
549 cord_individual_obj[indivial_i, :] = [ 20. 11. 241. 252.]
550 cord_individual_obj[indivial_i, :] = [ 21. 11. 219. 230.]
551 cord_individual_obj[indivial_i, :] = [ 22. 13. 263. 276.]
552 cord_individual_obj[indivial_i, :] = [ 23. 12. 265. 277.]
553 cord_individual_obj[indivial_i, :] = [ 24. 12. 265. 277.]
554
555 min(cord_individual_obj[:, 3]) = 212.0
556 histol_G_best_iter[iter, 3] = 212.0
557 Begin iteration:
558
559 iter = 17
560 cord_individual_obj[indivial_i, :] = [ 0. 10. 198. 208.]
561 cord_individual_obj[indivial_i, :] = [ 1. 12. 309. 321.]
562 cord_individual_obj[indivial_i, :] = [ 2. 11. 236. 247.]
563 cord_individual_obj[indivial_i, :] = [ 3. 10. 238. 248.]
564 cord_individual_obj[indivial_i, :] = [ 4. 10. 240. 250.]
565 cord_individual_obj[indivial_i, :] = [ 5. 12. 259. 271.]
566 cord_individual_obj[indivial_i, :] = [ 6. 12. 275. 287.]
567 cord_individual_obj[indivial_i, :] = [ 7. 12. 234. 246.]
568 cord_individual_obj[indivial_i, :] = [ 8. 12. 289. 301.]
569 cord_individual_obj[indivial_i, :] = [ 9. 10. 303. 313.]
570 cord_individual_obj[indivial_i, :] = [ 10. 12. 213. 225.]
571 cord_individual_obj[indivial_i, :] = [ 11. 10. 357. 367.]
572 cord_individual_obj[indivial_i, :] = [ 12. 11. 201. 212.]
573 cord_individual_obj[indivial_i, :] = [ 13. 12. 202. 214.]
574 cord_individual_obj[indivial_i, :] = [ 14. 10. 266. 276.]
575 cord_individual_obj[indivial_i, :] = [ 15. 14. 253. 267.]
576 cord_individual_obj[indivial_i, :] = [ 16. 11. 291. 302.]
577 cord_individual_obj[indivial_i, :] = [ 17. 14. 313. 327.]
578 cord_individual_obj[indivial_i, :] = [ 18. 10. 221. 231.]
579 cord_individual_obj[indivial_i, :] = [ 19. 12. 268. 280.]
580 cord_individual_obj[indivial_i, :] = [ 20. 10. 260. 270.]
581 cord_individual_obj[indivial_i, :] = [ 21. 10. 328. 338.]
582 cord_individual_obj[indivial_i, :] = [ 22. 10. 321. 331.]
583 cord_individual_obj[indivial_i, :] = [ 23. 11. 191. 202.]

```

```

584     cord_individual_obj[indivial_i, :] = [ 24. 11. 269. 280.]
585
586     min(cord_individual_obj[:, 3]) = 202.0
587     historl_G_best_iter[iter, 3] = 202.0
588 Begin iteration:
589
590 iter = 18
591     cord_individual_obj[indivial_i, :] = [ 0. 10. 309. 319.]
592     cord_individual_obj[indivial_i, :] = [ 1. 11. 362. 373.]
593     cord_individual_obj[indivial_i, :] = [ 2. 10. 231. 241.]
594     cord_individual_obj[indivial_i, :] = [ 3. 11. 319. 330.]
595     cord_individual_obj[indivial_i, :] = [ 4. 10. 251. 261.]
596     cord_individual_obj[indivial_i, :] = [ 5. 11. 255. 266.]
597     cord_individual_obj[indivial_i, :] = [ 6. 12. 240. 252.]
598     cord_individual_obj[indivial_i, :] = [ 7. 12. 231. 243.]
599     cord_individual_obj[indivial_i, :] = [ 8. 11. 271. 282.]
600     cord_individual_obj[indivial_i, :] = [ 9. 11. 335. 346.]
601     cord_individual_obj[indivial_i, :] = [ 10. 12. 319. 331.]
602     cord_individual_obj[indivial_i, :] = [ 11. 11. 191. 202.]
603     cord_individual_obj[indivial_i, :] = [ 12. 13. 262. 275.]
604     cord_individual_obj[indivial_i, :] = [ 13. 11. 308. 319.]
605     cord_individual_obj[indivial_i, :] = [ 14. 11. 287. 298.]
606     cord_individual_obj[indivial_i, :] = [ 15. 12. 194. 206.]
607     cord_individual_obj[indivial_i, :] = [ 16. 11. 295. 306.]
608     cord_individual_obj[indivial_i, :] = [ 17. 13. 397. 410.]
609     cord_individual_obj[indivial_i, :] = [ 18. 8. 191. 199.]
610     cord_individual_obj[indivial_i, :] = [ 19. 11. 229. 240.]
611     cord_individual_obj[indivial_i, :] = [ 20. 11. 273. 284.]
612     cord_individual_obj[indivial_i, :] = [ 21. 12. 297. 309.]
613     cord_individual_obj[indivial_i, :] = [ 22. 12. 278. 290.]
614     cord_individual_obj[indivial_i, :] = [ 23. 11. 267. 278.]
615     cord_individual_obj[indivial_i, :] = [ 24. 9. 211. 220.]
616
617     min(cord_individual_obj[:, 3]) = 199.0
618     historl_G_best_iter[iter, 3] = 199.0
619 Begin iteration:
620
621 iter = 19
622     cord_individual_obj[indivial_i, :] = [ 0. 10. 281. 291.]
623     cord_individual_obj[indivial_i, :] = [ 1. 11. 265. 276.]
624     cord_individual_obj[indivial_i, :] = [ 2. 12. 257. 269.]
625     cord_individual_obj[indivial_i, :] = [ 3. 9. 253. 262.]
626     cord_individual_obj[indivial_i, :] = [ 4. 12. 268. 280.]
627     cord_individual_obj[indivial_i, :] = [ 5. 11. 263. 274.]
628     cord_individual_obj[indivial_i, :] = [ 6. 10. 227. 237.]
629     cord_individual_obj[indivial_i, :] = [ 7. 10. 214. 224.]
630     cord_individual_obj[indivial_i, :] = [ 8. 10. 263. 273.]
631     cord_individual_obj[indivial_i, :] = [ 9. 9. 279. 288.]
632     cord_individual_obj[indivial_i, :] = [ 10. 11. 284. 295.]
633     cord_individual_obj[indivial_i, :] = [ 11. 11. 226. 237.]
634     cord_individual_obj[indivial_i, :] = [ 12. 11. 275. 286.]
635     cord_individual_obj[indivial_i, :] = [ 13. 10. 278. 288.]
636     cord_individual_obj[indivial_i, :] = [ 14. 10. 300. 310.]
637     cord_individual_obj[indivial_i, :] = [ 15. 11. 242. 253.]
638     cord_individual_obj[indivial_i, :] = [ 16. 11. 264. 275.]
639     cord_individual_obj[indivial_i, :] = [ 17. 8. 191. 199.]
640     cord_individual_obj[indivial_i, :] = [ 18. 11. 240. 251.]
641     cord_individual_obj[indivial_i, :] = [ 19. 11. 251. 262.]
642     cord_individual_obj[indivial_i, :] = [ 20. 9. 215. 224.]
643     cord_individual_obj[indivial_i, :] = [ 21. 12. 335. 347.]
644     cord_individual_obj[indivial_i, :] = [ 22. 10. 324. 334.]
645     cord_individual_obj[indivial_i, :] = [ 23. 10. 299. 309.]
646     cord_individual_obj[indivial_i, :] = [ 24. 9. 246. 255.]
647
648     min(cord_individual_obj[:, 3]) = 199.0
649     historl_G_best_iter[iter, 3] = 199.0
650 Begin iteration:
651
652 iter = 20
653     cord_individual_obj[indivial_i, :] = [ 0. 9. 340. 349.]
654     cord_individual_obj[indivial_i, :] = [ 1. 12. 304. 316.]
655     cord_individual_obj[indivial_i, :] = [ 2. 10. 281. 291.]
656     cord_individual_obj[indivial_i, :] = [ 3. 10. 312. 322.]
657     cord_individual_obj[indivial_i, :] = [ 4. 11. 277. 288.]
658     cord_individual_obj[indivial_i, :] = [ 5. 10. 271. 281.]
659     cord_individual_obj[indivial_i, :] = [ 6. 11. 281. 292.]
660     cord_individual_obj[indivial_i, :] = [ 7. 10. 319. 329.]
661     cord_individual_obj[indivial_i, :] = [ 8. 10. 284. 294.]
662     cord_individual_obj[indivial_i, :] = [ 9. 9. 317. 326.]
663     cord_individual_obj[indivial_i, :] = [ 10. 11. 244. 255.]
664     cord_individual_obj[indivial_i, :] = [ 11. 9. 320. 329.]
665     cord_individual_obj[indivial_i, :] = [ 12. 11. 294. 305.]
666     cord_individual_obj[indivial_i, :] = [ 13. 10. 283. 293.]
667     cord_individual_obj[indivial_i, :] = [ 14. 11. 259. 270.]

```

```

668 cord_individual_obj[indivial_i,:] = [ 15. 9. 248. 257.]
669 cord_individual_obj[indivial_i,:] = [ 16. 10. 282. 292.]
670 cord_individual_obj[indivial_i,:] = [ 17. 11. 262. 273.]
671 cord_individual_obj[indivial_i,:] = [ 18. 11. 278. 289.]
672 cord_individual_obj[indivial_i,:] = [ 19. 8. 288. 296.]
673 cord_individual_obj[indivial_i,:] = [ 20. 11. 244. 255.]
674 cord_individual_obj[indivial_i,:] = [ 21. 8. 191. 199.]
675 cord_individual_obj[indivial_i,:] = [ 22. 10. 274. 284.]
676 cord_individual_obj[indivial_i,:] = [ 23. 9. 241. 250.]
677 cord_individual_obj[indivial_i,:] = [ 24. 9. 281. 290.]
678
679 min(cord_individual_obj[:,3]) = 199.0
680 historl_G_best_iter[iter,3] = 199.0
681 Iteration calculate over
682
683
684
685
686 All item are in Bin and:
687 Bin area = 1080
688 Real_area = 241.0
689 Proportion_of_area = 0.22314814814814815
690 BEST_CHROM =
691 berth: [ 9.5 3.5 26. 19.5 26. 20. 4. 19.5 26. 8.5 14. 19. 5. 26.
692 1.5 11. 19.5 13. 15. 3. ]
693 time: [6. 6. 4. 1. 2. 7. 5. 3. 0. 2. 7. 5. 0. 1. 0. 0. 0. 3. 2. 2.]
694 num_QC: [2. 5. 2. 6. 2. 2. 3. 6. 4. 3. 3. 3. 4. 4. 3. 4. 4. 3. 3. 4.]
695 Objective function values and some other indicators:
696 Obj0 = 8.00          Obj1 = 191.00        Obj0 + Obj1 = 199.00
697 Total movement of crane: 52.00
698 Total waiting time in berth position: 56.00
699 Total index of q during berthing: 1192.00
700 Specific arrangement for each vessel:
701 V_id: 0      li: 5.0           xi: 9.5       bow of i: 7.0           tail of i: 12.0           gama_i0: 6.0           gama_i1: 7.0
60.0           work load gap_i: 0   gama_i1 + 1: 8.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
702 V_id: 1      li: 7.0           xi: 3.5       bow of i: 0.0           tail of i: 7.0           gama_i0: 6.0           gama_i1: 7.0
160.0          work load gap_i: 0  gama_i1 + 1: 8.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
703 V_id: 2      li: 4.0           xi: 26.0      bow of i: 24.0          tail of i: 28.0           gama_i0: 4.0           gama_i1: 7
.0            work load gap_i: 0   gama_i1 + 1: 8.0   gama_i1 - gama_i0: 3.0   duration_time_i: 4.0
load_i: 160.0
704 V_id: 3      li: 9.0           xi: 19.5      bow of i: 15.0          tail of i: 24.0           gama_i0: 1.0           gama_i1: 1
.0            work load gap_i: 0   gama_i1 + 1: 2.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
load_i: 100.0
705 V_id: 4      li: 4.0           xi: 26.0      bow of i: 24.0          tail of i: 28.0           gama_i0: 2.0           gama_i1: 3
.0            work load gap_i: 0   gama_i1 + 1: 4.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
load_i: 60.0
706 V_id: 5      li: 8.0           xi: 20.0      bow of i: 16.0          tail of i: 24.0           gama_i0: 7.0           gama_i1: 8
.0            work load gap_i: 0   gama_i1 + 1: 9.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
load_i: 80.0
707 V_id: 6      li: 8.0           xi: 4.0       bow of i: 0.0           tail of i: 8.0           gama_i0: 5.0           gama_i1: 5.0
60.0          work load gap_i: 0   gama_i1 + 1: 6.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
708 V_id: 7      li: 9.0           xi: 19.5      bow of i: 15.0          tail of i: 24.0           gama_i0: 3.0           gama_i1: 4
.0            work load gap_i: 0   gama_i1 + 1: 5.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
load_i: 160.0
709 V_id: 8      li: 4.0           xi: 26.0      bow of i: 24.0          tail of i: 28.0           gama_i0: 0.0           gama_i1: 0
.0            work load gap_i: 0   gama_i1 + 1: 1.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
load_i: 80.0
710 V_id: 9      li: 5.0           xi: 8.5       bow of i: 6.0           tail of i: 11.0           gama_i0: 2.0           gama_i1: 4.0
160.0          work load gap_i: 0  gama_i1 + 1: 5.0   gama_i1 - gama_i0: 2.0   duration_time_i: 3.0
711 V_id: 10     li: 4.0           xi: 14.0      bow of i: 12.0          tail of i: 16.0           gama_i0: 7.0           gama_i1: 1
.8            work load gap_i: 0   gama_i1 + 1: 9.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
load_i: 100.0
712 V_id: 11     li: 8.0           xi: 19.0      bow of i: 15.0          tail of i: 23.0           gama_i0: 5.0           gama_i1: 1
.6            work load gap_i: 0   gama_i1 + 1: 7.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
load_i: 80.0
713 V_id: 12     li: 4.0           xi: 5.0       bow of i: 3.0           tail of i: 7.0           gama_i0: 0.0           gama_i1: 1.0
140.0          work load gap_i: 0  gama_i1 + 1: 2.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
714 V_id: 13     li: 4.0           xi: 26.0      bow of i: 24.0          tail of i: 28.0           gama_i0: 1.0           gama_i1: 1
.1            work load gap_i: 0   gama_i1 + 1: 2.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
load_i: 80.0
715 V_id: 14     li: 3.0           xi: 1.5       bow of i: 0.0           tail of i: 3.0           gama_i0: 0.0           gama_i1: 1.0
100.0          work load gap_i: 0  gama_i1 + 1: 2.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
716 V_id: 15     li: 8.0           xi: 11.0      bow of i: 7.0           tail of i: 15.0           gama_i0: 0.0           gama_i1: 1
.1            work load gap_i: 0   gama_i1 + 1: 2.0   gama_i1 - gama_i0: 1.0   duration_time_i: 2.0
load_i: 120.0
717 V_id: 16     li: 9.0           xi: 19.5      bow of i: 15.0          tail of i: 24.0           gama_i0: 0.0           gama_i1: 1
.0            work load gap_i: 0   gama_i1 + 1: 1.0   gama_i1 - gama_i0: 0.0   duration_time_i: 1.0
load_i: 80.0

```

unknown

718	V_id: 17 : 5.0 load_i: 160.0	li: 4.0 gama_i1 + 1: 6.0 work load gap_i: 0	xi: 13.0 gama_i1 - gama_i0: 2.0	bow of i: 11.0	tail of i: 15.0 duration_time_i: 3.0	gama_i0: 3.0 demand_i: 160.0	gama_i1 work
719	V_id: 18 : 2.0 load_i: 60.0	li: 8.0 gama_i1 + 1: 3.0 work load gap_i: 0	xi: 15.0 gama_i1 - gama_i0: 0.0	bow of i: 11.0	tail of i: 19.0 duration_time_i: 1.0	gama_i0: 2.0 demand_i: 60.0	gama_i1 work
720	V_id: 19 140.0	li: 6.0 gama_i1 + 1: 4.0 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: 2.0 demand_i: 140.0	gama_i1: 3.0 work load_i:

721

722 Algorithm finished and the total CPU time: 546 s

723 End

724