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1 "E:\My_Python_Code\3_000001\1_00000000\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\pydeconsole.py" --mode=client --port=43760
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\My_Python_Code\3_000001\1_00000000\1_LW_00002\6_0000\2 python code\01_My_Python_Code', 'E:/1_000003_000001_00000000/1_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_000003_000001_00000000/1_LW_00002/6_0000/2 python code/01_My_Python_Code/main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1_000003_000001_00000000/1_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_5_6_standerd_test.xlsx optimization process.
14
15 Start
16     Read basic data
17         V = 5
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 = 0.019815095719651676
29     r2 = 0.019815095719651676
30 Begin iteration:
31
32 iter = 0
33     cord_individual_obj[individual_i, :] = [0. 2. 2. 4.]
34     cord_individual_obj[individual_i, :] = [1. 1. 1. 2.]
35     cord_individual_obj[individual_i, :] = [2. 3. 2. 5.]
36     cord_individual_obj[individual_i, :] = [3. 2. 18. 20.]
37     cord_individual_obj[individual_i, :] = [4. 1. 1. 2.]
38     cord_individual_obj[individual_i, :] = [5. 2. 2. 4.]
39     cord_individual_obj[individual_i, :] = [6. 3. 2. 5.]
40     cord_individual_obj[individual_i, :] = [7. 5. 14. 19.]
41     cord_individual_obj[individual_i, :] = [8. 2. 1. 3.]
42     cord_individual_obj[individual_i, :] = [9. 3. 2. 5.]
43     cord_individual_obj[individual_i, :] = [10. 1. 1. 2.]
44     cord_individual_obj[individual_i, :] = [11. 3. 1. 4.]
45     cord_individual_obj[individual_i, :] = [12. 2. 1. 3.]
46     cord_individual_obj[individual_i, :] = [13. 4. 5. 9.]
47     cord_individual_obj[individual_i, :] = [14. 2. 8. 10.]
48     cord_individual_obj[individual_i, :] = [15. 4. 3. 7.]
49     cord_individual_obj[individual_i, :] = [16. 4. 13. 17.]
50     cord_individual_obj[individual_i, :] = [17. 3. 2. 5.]
51     cord_individual_obj[individual_i, :] = [18. 3. 2. 5.]
52     cord_individual_obj[individual_i, :] = [19. 4. 1. 5.]
53     cord_individual_obj[individual_i, :] = [20. 3. 2. 5.]
54     cord_individual_obj[individual_i, :] = [21. 4. 1. 5.]
55     cord_individual_obj[individual_i, :] = [22. 2. 2. 4.]
56     cord_individual_obj[individual_i, :] = [23. 2. 2. 4.]
57     cord_individual_obj[individual_i, :] = [24. 2. 2. 4.]
58
59 min(cord_individual_obj[:, 3]) = 2.0
60 historl_G_best_iter[iter, 3] = 2.0
61 Begin iteration:
62
63 iter = 1
64     cord_individual_obj[individual_i, :] = [0. 3. 26. 29.]
65     cord_individual_obj[individual_i, :] = [1. 3. 2. 5.]
66     cord_individual_obj[individual_i, :] = [2. 3. 18. 21.]
67     cord_individual_obj[individual_i, :] = [3. 1. 1. 2.]
68     cord_individual_obj[individual_i, :] = [4. 2. 2. 4.]
69     cord_individual_obj[individual_i, :] = [5. 3. 25. 28.]
70     cord_individual_obj[individual_i, :] = [6. 3. 2. 5.]
71     cord_individual_obj[individual_i, :] = [7. 2. 17. 19.]
72     cord_individual_obj[individual_i, :] = [8. 5. 14. 19.]
73     cord_individual_obj[individual_i, :] = [9. 3. 7. 10.]
74     cord_individual_obj[individual_i, :] = [10. 2. 17. 19.]
75     cord_individual_obj[individual_i, :] = [11. 3. 17. 20.]
76     cord_individual_obj[individual_i, :] = [12. 2. 7. 9.]
77     cord_individual_obj[individual_i, :] = [13. 3. 26. 29.]
78     cord_individual_obj[individual_i, :] = [14. 4. 2. 6.]
79     cord_individual_obj[individual_i, :] = [15. 3. 5. 8.]

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80 cord_individual_obj[indivial_i, :] = [16. 2. 1. 3.]
81 cord_individual_obj[indivial_i, :] = [17. 3. 18. 21.]
82 cord_individual_obj[indivial_i, :] = [18. 3. 17. 20.]
83 cord_individual_obj[indivial_i, :] = [19. 3. 1. 4.]
84 cord_individual_obj[indivial_i, :] = [20. 2. 1. 3.]
85 cord_individual_obj[indivial_i, :] = [21. 2. 25. 27.]
86 cord_individual_obj[indivial_i, :] = [22. 2. 13. 15.]
87 cord_individual_obj[indivial_i, :] = [23. 2. 25. 27.]
88 cord_individual_obj[indivial_i, :] = [24. 3. 42. 45.]
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. 3. 26. 29.]
96 cord_individual_obj[indivial_i, :] = [1. 3. 2. 5.]
97 cord_individual_obj[indivial_i, :] = [2. 3. 2. 5.]
98 cord_individual_obj[indivial_i, :] = [3. 2. 13. 15.]
99 cord_individual_obj[indivial_i, :] = [4. 2. 2. 4.]
100 cord_individual_obj[indivial_i, :] = [5. 2. 1. 3.]
101 cord_individual_obj[indivial_i, :] = [6. 3. 6. 9.]
102 cord_individual_obj[indivial_i, :] = [7. 2. 1. 3.]
103 cord_individual_obj[indivial_i, :] = [8. 3. 26. 29.]
104 cord_individual_obj[indivial_i, :] = [9. 2. 7. 9.]
105 cord_individual_obj[indivial_i, :] = [10. 2. 17. 19.]
106 cord_individual_obj[indivial_i, :] = [11. 3. 18. 21.]
107 cord_individual_obj[indivial_i, :] = [12. 2. 8. 10.]
108 cord_individual_obj[indivial_i, :] = [13. 3. 42. 45.]
109 cord_individual_obj[indivial_i, :] = [14. 3. 2. 5.]
110 cord_individual_obj[indivial_i, :] = [15. 3. 2. 5.]
111 cord_individual_obj[indivial_i, :] = [16. 2. 1. 3.]
112 cord_individual_obj[indivial_i, :] = [17. 3. 26. 29.]
113 cord_individual_obj[indivial_i, :] = [18. 3. 18. 21.]
114 cord_individual_obj[indivial_i, :] = [19. 3. 1. 4.]
115 cord_individual_obj[indivial_i, :] = [20. 3. 26. 29.]
116 cord_individual_obj[indivial_i, :] = [21. 3. 26. 29.]
117 cord_individual_obj[indivial_i, :] = [22. 2. 13. 15.]
118 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
119 cord_individual_obj[indivial_i, :] = [24. 1. 1. 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. 5. 7.]
127 cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]
128 cord_individual_obj[indivial_i, :] = [2. 3. 2. 5.]
129 cord_individual_obj[indivial_i, :] = [3. 3. 1. 4.]
130 cord_individual_obj[indivial_i, :] = [4. 2. 2. 4.]
131 cord_individual_obj[indivial_i, :] = [5. 2. 1. 3.]
132 cord_individual_obj[indivial_i, :] = [6. 2. 1. 3.]
133 cord_individual_obj[indivial_i, :] = [7. 3. 1. 4.]
134 cord_individual_obj[indivial_i, :] = [8. 5. 26. 31.]
135 cord_individual_obj[indivial_i, :] = [9. 2. 1. 3.]
136 cord_individual_obj[indivial_i, :] = [10. 3. 2. 5.]
137 cord_individual_obj[indivial_i, :] = [11. 2. 18. 20.]
138 cord_individual_obj[indivial_i, :] = [12. 4. 3. 7.]
139 cord_individual_obj[indivial_i, :] = [13. 1. 1. 2.]
140 cord_individual_obj[indivial_i, :] = [14. 3. 2. 5.]
141 cord_individual_obj[indivial_i, :] = [15. 2. 2. 4.]
142 cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]
143 cord_individual_obj[indivial_i, :] = [17. 2. 17. 19.]
144 cord_individual_obj[indivial_i, :] = [18. 1. 9. 10.]
145 cord_individual_obj[indivial_i, :] = [19. 3. 2. 5.]
146 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
147 cord_individual_obj[indivial_i, :] = [21. 3. 2. 5.]
148 cord_individual_obj[indivial_i, :] = [22. 3. 2. 5.]
149 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
150 cord_individual_obj[indivial_i, :] = [24. 3. 2. 5.]
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. 2. 4.]
158 cord_individual_obj[indivial_i, :] = [1. 3. 2. 5.]
159 cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]
160 cord_individual_obj[indivial_i, :] = [3. 3. 2. 5.]
161 cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]
162 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
163 cord_individual_obj[indivial_i, :] = [6. 1. 1. 2.]

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164 cord_individual_obj[indivial_i, :] = [7. 1. 1. 2.]
165 cord_individual_obj[indivial_i, :] = [8. 1. 1. 2.]
166 cord_individual_obj[indivial_i, :] = [9. 3. 1. 4.]
167 cord_individual_obj[indivial_i, :] = [10. 1. 1. 2.]
168 cord_individual_obj[indivial_i, :] = [11. 2. 2. 4.]
169 cord_individual_obj[indivial_i, :] = [12. 2. 2. 4.]
170 cord_individual_obj[indivial_i, :] = [13. 1. 1. 2.]
171 cord_individual_obj[indivial_i, :] = [14. 2. 2. 4.]
172 cord_individual_obj[indivial_i, :] = [15. 3. 3. 6.]
173 cord_individual_obj[indivial_i, :] = [16. 2. 2. 4.]
174 cord_individual_obj[indivial_i, :] = [17. 3. 2. 5.]
175 cord_individual_obj[indivial_i, :] = [18. 3. 1. 4.]
176 cord_individual_obj[indivial_i, :] = [19. 2. 2. 4.]
177 cord_individual_obj[indivial_i, :] = [20. 2. 1. 3.]
178 cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]
179 cord_individual_obj[indivial_i, :] = [22. 3. 2. 5.]
180 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
181 cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]
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. 1. 3.]
189 cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]
190 cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]
191 cord_individual_obj[indivial_i, :] = [3. 3. 2. 5.]
192 cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]
193 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
194 cord_individual_obj[indivial_i, :] = [6. 2. 1. 3.]
195 cord_individual_obj[indivial_i, :] = [7. 2. 2. 4.]
196 cord_individual_obj[indivial_i, :] = [8. 4. 1. 5.]
197 cord_individual_obj[indivial_i, :] = [9. 3. 2. 5.]
198 cord_individual_obj[indivial_i, :] = [10. 2. 2. 4.]
199 cord_individual_obj[indivial_i, :] = [11. 3. 18. 21.]
200 cord_individual_obj[indivial_i, :] = [12. 2. 1. 3.]
201 cord_individual_obj[indivial_i, :] = [13. 2. 2. 4.]
202 cord_individual_obj[indivial_i, :] = [14. 2. 1. 3.]
203 cord_individual_obj[indivial_i, :] = [15. 1. 1. 2.]
204 cord_individual_obj[indivial_i, :] = [16. 2. 2. 4.]
205 cord_individual_obj[indivial_i, :] = [17. 2. 1. 3.]
206 cord_individual_obj[indivial_i, :] = [18. 2. 25. 27.]
207 cord_individual_obj[indivial_i, :] = [19. 3. 1. 4.]
208 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
209 cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]
210 cord_individual_obj[indivial_i, :] = [22. 2. 2. 4.]
211 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
212 cord_individual_obj[indivial_i, :] = [24. 3. 2. 5.]
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. 3. 2. 5.]
220 cord_individual_obj[indivial_i, :] = [1. 3. 2. 5.]
221 cord_individual_obj[indivial_i, :] = [2. 3. 18. 21.]
222 cord_individual_obj[indivial_i, :] = [3. 3. 1. 4.]
223 cord_individual_obj[indivial_i, :] = [4. 2. 2. 4.]
224 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
225 cord_individual_obj[indivial_i, :] = [6. 2. 1. 3.]
226 cord_individual_obj[indivial_i, :] = [7. 2. 2. 4.]
227 cord_individual_obj[indivial_i, :] = [8. 4. 6. 10.]
228 cord_individual_obj[indivial_i, :] = [9. 2. 1. 3.]
229 cord_individual_obj[indivial_i, :] = [10. 3. 2. 5.]
230 cord_individual_obj[indivial_i, :] = [11. 2. 38. 40.]
231 cord_individual_obj[indivial_i, :] = [12. 3. 7. 10.]
232 cord_individual_obj[indivial_i, :] = [13. 2. 2. 4.]
233 cord_individual_obj[indivial_i, :] = [14. 3. 2. 5.]
234 cord_individual_obj[indivial_i, :] = [15. 3. 3. 6.]
235 cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]
236 cord_individual_obj[indivial_i, :] = [17. 3. 2. 5.]
237 cord_individual_obj[indivial_i, :] = [18. 1. 1. 2.]
238 cord_individual_obj[indivial_i, :] = [19. 3. 3. 6.]
239 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
240 cord_individual_obj[indivial_i, :] = [21. 3. 2. 5.]
241 cord_individual_obj[indivial_i, :] = [22. 3. 1. 4.]
242 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
243 cord_individual_obj[indivial_i, :] = [24. 3. 2. 5.]
244
245 min(cord_individual_obj[:, 3]) = 2.0
246 historl_G_best_iter[iter, 3] = 2.0
247 Begin iteration:

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248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [0. 2. 1. 3.]
251 cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]
252 cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]
253 cord_individual_obj[indivial_i, :] = [3. 2. 1. 3.]
254 cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]
255 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
256 cord_individual_obj[indivial_i, :] = [6. 2. 2. 4.]
257 cord_individual_obj[indivial_i, :] = [7. 2. 1. 3.]
258 cord_individual_obj[indivial_i, :] = [8. 3. 2. 5.]
259 cord_individual_obj[indivial_i, :] = [9. 3. 2. 5.]
260 cord_individual_obj[indivial_i, :] = [10. 2. 1. 3.]
261 cord_individual_obj[indivial_i, :] = [11. 1. 1. 2.]
262 cord_individual_obj[indivial_i, :] = [12. 2. 1. 3.]
263 cord_individual_obj[indivial_i, :] = [13. 2. 2. 4.]
264 cord_individual_obj[indivial_i, :] = [14. 2. 2. 4.]
265 cord_individual_obj[indivial_i, :] = [15. 3. 2. 5.]
266 cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]
267 cord_individual_obj[indivial_i, :] = [17. 2. 2. 4.]
268 cord_individual_obj[indivial_i, :] = [18. 3. 1. 4.]
269 cord_individual_obj[indivial_i, :] = [19. 2. 2. 4.]
270 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
271 cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]
272 cord_individual_obj[indivial_i, :] = [22. 2. 1. 3.]
273 cord_individual_obj[indivial_i, :] = [23. 2. 2. 4.]
274 cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]
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. 1. 3.]
282 cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]
283 cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]
284 cord_individual_obj[indivial_i, :] = [3. 2. 2. 4.]
285 cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]
286 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
287 cord_individual_obj[indivial_i, :] = [6. 1. 1. 2.]
288 cord_individual_obj[indivial_i, :] = [7. 2. 2. 4.]
289 cord_individual_obj[indivial_i, :] = [8. 1. 1. 2.]
290 cord_individual_obj[indivial_i, :] = [9. 3. 1. 4.]
291 cord_individual_obj[indivial_i, :] = [10. 2. 2. 4.]
292 cord_individual_obj[indivial_i, :] = [11. 2. 1. 3.]
293 cord_individual_obj[indivial_i, :] = [12. 2. 2. 4.]
294 cord_individual_obj[indivial_i, :] = [13. 1. 1. 2.]
295 cord_individual_obj[indivial_i, :] = [14. 2. 1. 3.]
296 cord_individual_obj[indivial_i, :] = [15. 2. 2. 4.]
297 cord_individual_obj[indivial_i, :] = [16. 2. 2. 4.]
298 cord_individual_obj[indivial_i, :] = [17. 2. 2. 4.]
299 cord_individual_obj[indivial_i, :] = [18. 3. 1. 4.]
300 cord_individual_obj[indivial_i, :] = [19. 2. 2. 4.]
301 cord_individual_obj[indivial_i, :] = [20. 2. 1. 3.]
302 cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]
303 cord_individual_obj[indivial_i, :] = [22. 2. 1. 3.]
304 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
305 cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]
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. 1. 3.]
313 cord_individual_obj[indivial_i, :] = [1. 1. 1. 2.]
314 cord_individual_obj[indivial_i, :] = [2. 1. 1. 2.]
315 cord_individual_obj[indivial_i, :] = [3. 2. 1. 3.]
316 cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]
317 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
318 cord_individual_obj[indivial_i, :] = [6. 1. 1. 2.]
319 cord_individual_obj[indivial_i, :] = [7. 2. 2. 4.]
320 cord_individual_obj[indivial_i, :] = [8. 3. 1. 4.]
321 cord_individual_obj[indivial_i, :] = [9. 1. 1. 2.]
322 cord_individual_obj[indivial_i, :] = [10. 2. 1. 3.]
323 cord_individual_obj[indivial_i, :] = [11. 3. 1. 4.]
324 cord_individual_obj[indivial_i, :] = [12. 2. 1. 3.]
325 cord_individual_obj[indivial_i, :] = [13. 1. 1. 2.]
326 cord_individual_obj[indivial_i, :] = [14. 2. 1. 3.]
327 cord_individual_obj[indivial_i, :] = [15. 3. 2. 5.]
328 cord_individual_obj[indivial_i, :] = [16. 2. 2. 4.]
329 cord_individual_obj[indivial_i, :] = [17. 2. 2. 4.]
330 cord_individual_obj[indivial_i, :] = [18. 2. 1. 3.]
331 cord_individual_obj[indivial_i, :] = [19. 2. 2. 4.]

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332 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
333 cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]
334 cord_individual_obj[indivial_i, :] = [22. 2. 2. 4.]
335 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
336 cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]
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. 1. 3.]
344 cord_individual_obj[indivial_i, :] = [1. 1. 1. 2.]
345 cord_individual_obj[indivial_i, :] = [2. 3. 2. 5.]
346 cord_individual_obj[indivial_i, :] = [3. 3. 1. 4.]
347 cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]
348 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
349 cord_individual_obj[indivial_i, :] = [6. 2. 2. 4.]
350 cord_individual_obj[indivial_i, :] = [7. 2. 1. 3.]
351 cord_individual_obj[indivial_i, :] = [8. 4. 1. 5.]
352 cord_individual_obj[indivial_i, :] = [9. 3. 1. 4.]
353 cord_individual_obj[indivial_i, :] = [10. 3. 17. 20.]
354 cord_individual_obj[indivial_i, :] = [11. 3. 2. 5.]
355 cord_individual_obj[indivial_i, :] = [12. 4. 2. 6.]
356 cord_individual_obj[indivial_i, :] = [13. 2. 1. 3.]
357 cord_individual_obj[indivial_i, :] = [14. 3. 2. 5.]
358 cord_individual_obj[indivial_i, :] = [15. 1. 1. 2.]
359 cord_individual_obj[indivial_i, :] = [16. 2. 2. 4.]
360 cord_individual_obj[indivial_i, :] = [17. 2. 2. 4.]
361 cord_individual_obj[indivial_i, :] = [18. 3. 2. 5.]
362 cord_individual_obj[indivial_i, :] = [19. 3. 2. 5.]
363 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
364 cord_individual_obj[indivial_i, :] = [21. 2. 1. 3.]
365 cord_individual_obj[indivial_i, :] = [22. 3. 1. 4.]
366 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
367 cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]
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. 1. 3.]
375 cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]
376 cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]
377 cord_individual_obj[indivial_i, :] = [3. 1. 1. 2.]
378 cord_individual_obj[indivial_i, :] = [4. 2. 1. 3.]
379 cord_individual_obj[indivial_i, :] = [5. 1. 1. 2.]
380 cord_individual_obj[indivial_i, :] = [6. 3. 2. 5.]
381 cord_individual_obj[indivial_i, :] = [7. 1. 1. 2.]
382 cord_individual_obj[indivial_i, :] = [8. 1. 1. 2.]
383 cord_individual_obj[indivial_i, :] = [9. 2. 2. 4.]
384 cord_individual_obj[indivial_i, :] = [10. 1. 1. 2.]
385 cord_individual_obj[indivial_i, :] = [11. 1. 1. 2.]
386 cord_individual_obj[indivial_i, :] = [12. 2. 2. 4.]
387 cord_individual_obj[indivial_i, :] = [13. 3. 1. 4.]
388 cord_individual_obj[indivial_i, :] = [14. 2. 1. 3.]
389 cord_individual_obj[indivial_i, :] = [15. 1. 1. 2.]
390 cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]
391 cord_individual_obj[indivial_i, :] = [17. 2. 2. 4.]
392 cord_individual_obj[indivial_i, :] = [18. 2. 1. 3.]
393 cord_individual_obj[indivial_i, :] = [19. 2. 1. 3.]
394 cord_individual_obj[indivial_i, :] = [20. 3. 2. 5.]
395 cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]
396 cord_individual_obj[indivial_i, :] = [22. 2. 1. 3.]
397 cord_individual_obj[indivial_i, :] = [23. 2. 2. 4.]
398 cord_individual_obj[indivial_i, :] = [24. 3. 2. 5.]
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. 3. 41. 44.]
406 cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]
407 cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]
408 cord_individual_obj[indivial_i, :] = [3. 2. 1. 3.]
409 cord_individual_obj[indivial_i, :] = [4. 2. 1. 3.]
410 cord_individual_obj[indivial_i, :] = [5. 2. 2. 4.]
411 cord_individual_obj[indivial_i, :] = [6. 1. 1. 2.]
412 cord_individual_obj[indivial_i, :] = [7. 1. 1. 2.]
413 cord_individual_obj[indivial_i, :] = [8. 4. 1. 5.]
414 cord_individual_obj[indivial_i, :] = [9. 3. 2. 5.]
415 cord_individual_obj[indivial_i, :] = [10. 1. 1. 2.]

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416 cord_individual_obj[indivial_i,:] = [11. 1. 1. 2.]
417 cord_individual_obj[indivial_i,:] = [12. 2. 2. 4.]
418 cord_individual_obj[indivial_i,:] = [13. 2. 1. 3.]
419 cord_individual_obj[indivial_i,:] = [14. 3. 2. 5.]
420 cord_individual_obj[indivial_i,:] = [15. 2. 2. 4.]
421 cord_individual_obj[indivial_i,:] = [16. 2. 2. 4.]
422 cord_individual_obj[indivial_i,:] = [17. 2. 2. 4.]
423 cord_individual_obj[indivial_i,:] = [18. 3. 1. 4.]
424 cord_individual_obj[indivial_i,:] = [19. 2. 2. 4.]
425 cord_individual_obj[indivial_i,:] = [20. 2. 2. 4.]
426 cord_individual_obj[indivial_i,:] = [21. 3. 2. 5.]
427 cord_individual_obj[indivial_i,:] = [22. 2. 1. 3.]
428 cord_individual_obj[indivial_i,:] = [23. 2. 2. 4.]
429 cord_individual_obj[indivial_i,:] = [24. 2. 2. 4.]
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. 1. 1. 2.]
437 cord_individual_obj[indivial_i,:] = [1. 2. 1. 3.]
438 cord_individual_obj[indivial_i,:] = [2. 3. 1. 4.]
439 cord_individual_obj[indivial_i,:] = [3. 2. 1. 3.]
440 cord_individual_obj[indivial_i,:] = [4. 2. 1. 3.]
441 cord_individual_obj[indivial_i,:] = [5. 2. 1. 3.]
442 cord_individual_obj[indivial_i,:] = [6. 2. 2. 4.]
443 cord_individual_obj[indivial_i,:] = [7. 2. 1. 3.]
444 cord_individual_obj[indivial_i,:] = [8. 3. 42. 45.]
445 cord_individual_obj[indivial_i,:] = [9. 2. 2. 4.]
446 cord_individual_obj[indivial_i,:] = [10. 2. 1. 3.]
447 cord_individual_obj[indivial_i,:] = [11. 2. 1. 3.]
448 cord_individual_obj[indivial_i,:] = [12. 2. 2. 4.]
449 cord_individual_obj[indivial_i,:] = [13. 1. 1. 2.]
450 cord_individual_obj[indivial_i,:] = [14. 2. 18. 20.]
451 cord_individual_obj[indivial_i,:] = [15. 3. 2. 5.]
452 cord_individual_obj[indivial_i,:] = [16. 1. 1. 2.]
453 cord_individual_obj[indivial_i,:] = [17. 3. 2. 5.]
454 cord_individual_obj[indivial_i,:] = [18. 2. 2. 4.]
455 cord_individual_obj[indivial_i,:] = [19. 2. 2. 4.]
456 cord_individual_obj[indivial_i,:] = [20. 2. 2. 4.]
457 cord_individual_obj[indivial_i,:] = [21. 2. 2. 4.]
458 cord_individual_obj[indivial_i,:] = [22. 2. 1. 3.]
459 cord_individual_obj[indivial_i,:] = [23. 2. 2. 4.]
460 cord_individual_obj[indivial_i,:] = [24. 2. 2. 4.]
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. 1. 3.]
468 cord_individual_obj[indivial_i,:] = [1. 3. 2. 5.]
469 cord_individual_obj[indivial_i,:] = [2. 3. 8. 11.]
470 cord_individual_obj[indivial_i,:] = [3. 3. 1. 4.]
471 cord_individual_obj[indivial_i,:] = [4. 2. 1. 3.]
472 cord_individual_obj[indivial_i,:] = [5. 2. 2. 4.]
473 cord_individual_obj[indivial_i,:] = [6. 3. 2. 5.]
474 cord_individual_obj[indivial_i,:] = [7. 2. 1. 3.]
475 cord_individual_obj[indivial_i,:] = [8. 1. 1. 2.]
476 cord_individual_obj[indivial_i,:] = [9. 2. 1. 3.]
477 cord_individual_obj[indivial_i,:] = [10. 2. 7. 9.]
478 cord_individual_obj[indivial_i,:] = [11. 3. 2. 5.]
479 cord_individual_obj[indivial_i,:] = [12. 3. 1. 4.]
480 cord_individual_obj[indivial_i,:] = [13. 3. 2. 5.]
481 cord_individual_obj[indivial_i,:] = [14. 3. 2. 5.]
482 cord_individual_obj[indivial_i,:] = [15. 2. 2. 4.]
483 cord_individual_obj[indivial_i,:] = [16. 2. 2. 4.]
484 cord_individual_obj[indivial_i,:] = [17. 2. 2. 4.]
485 cord_individual_obj[indivial_i,:] = [18. 3. 1. 4.]
486 cord_individual_obj[indivial_i,:] = [19. 1. 1. 2.]
487 cord_individual_obj[indivial_i,:] = [20. 2. 2. 4.]
488 cord_individual_obj[indivial_i,:] = [21. 3. 2. 5.]
489 cord_individual_obj[indivial_i,:] = [22. 2. 1. 3.]
490 cord_individual_obj[indivial_i,:] = [23. 2. 2. 4.]
491 cord_individual_obj[indivial_i,:] = [24. 3. 2. 5.]
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. 1. 3.]
499 cord_individual_obj[indivial_i,:] = [1. 2. 2. 4.]

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

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unknown

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584     cord_individual_obj[indivial_i, :] = [24. 2. 1. 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. 1. 1. 2.]  
592     cord_individual_obj[indivial_i, :] = [1. 2. 2. 4.]  
593     cord_individual_obj[indivial_i, :] = [2. 3. 8. 11.]  
594     cord_individual_obj[indivial_i, :] = [3. 3. 1. 4.]  
595     cord_individual_obj[indivial_i, :] = [4. 2. 1. 3.]  
596     cord_individual_obj[indivial_i, :] = [5. 1. 1. 2.]  
597     cord_individual_obj[indivial_i, :] = [6. 2. 2. 4.]  
598     cord_individual_obj[indivial_i, :] = [7. 2. 1. 3.]  
599     cord_individual_obj[indivial_i, :] = [8. 4. 1. 5.]  
600     cord_individual_obj[indivial_i, :] = [9. 2. 1. 3.]  
601     cord_individual_obj[indivial_i, :] = [10. 2. 7. 9.]  
602     cord_individual_obj[indivial_i, :] = [11. 2. 1. 3.]  
603     cord_individual_obj[indivial_i, :] = [12. 3. 1. 4.]  
604     cord_individual_obj[indivial_i, :] = [13. 1. 1. 2.]  
605     cord_individual_obj[indivial_i, :] = [14. 2. 1. 3.]  
606     cord_individual_obj[indivial_i, :] = [15. 2. 1. 3.]  
607     cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]  
608     cord_individual_obj[indivial_i, :] = [17. 2. 1. 3.]  
609     cord_individual_obj[indivial_i, :] = [18. 3. 1. 4.]  
610     cord_individual_obj[indivial_i, :] = [19. 2. 2. 4.]  
611     cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]  
612     cord_individual_obj[indivial_i, :] = [21. 2. 2. 4.]  
613     cord_individual_obj[indivial_i, :] = [22. 2. 1. 3.]  
614     cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]  
615     cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]  
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. 1. 3.]  
623     cord_individual_obj[indivial_i, :] = [1. 3. 2. 5.]  
624     cord_individual_obj[indivial_i, :] = [2. 1. 1. 2.]  
625     cord_individual_obj[indivial_i, :] = [3. 3. 2. 5.]  
626     cord_individual_obj[indivial_i, :] = [4. 2. 1. 3.]  
627     cord_individual_obj[indivial_i, :] = [5. 1. 1. 2.]  
628     cord_individual_obj[indivial_i, :] = [6. 2. 2. 4.]  
629     cord_individual_obj[indivial_i, :] = [7. 2. 1. 3.]  
630     cord_individual_obj[indivial_i, :] = [8. 2. 13. 15.]  
631     cord_individual_obj[indivial_i, :] = [9. 2. 2. 4.]  
632     cord_individual_obj[indivial_i, :] = [10. 2. 1. 3.]  
633     cord_individual_obj[indivial_i, :] = [11. 3. 1. 4.]  
634     cord_individual_obj[indivial_i, :] = [12. 3. 1. 4.]  
635     cord_individual_obj[indivial_i, :] = [13. 2. 1. 3.]  
636     cord_individual_obj[indivial_i, :] = [14. 2. 1. 3.]  
637     cord_individual_obj[indivial_i, :] = [15. 2. 2. 4.]  
638     cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]  
639     cord_individual_obj[indivial_i, :] = [17. 3. 2. 5.]  
640     cord_individual_obj[indivial_i, :] = [18. 3. 2. 5.]  
641     cord_individual_obj[indivial_i, :] = [19. 1. 1. 2.]  
642     cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]  
643     cord_individual_obj[indivial_i, :] = [21. 3. 2. 5.]  
644     cord_individual_obj[indivial_i, :] = [22. 3. 1. 4.]  
645     cord_individual_obj[indivial_i, :] = [23. 2. 2. 4.]  
646     cord_individual_obj[indivial_i, :] = [24. 3. 2. 5.]  
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. 3. 2. 5.]  
654     cord_individual_obj[indivial_i, :] = [1. 3. 2. 5.]  
655     cord_individual_obj[indivial_i, :] = [2. 2. 1. 3.]  
656     cord_individual_obj[indivial_i, :] = [3. 2. 1. 3.]  
657     cord_individual_obj[indivial_i, :] = [4. 1. 1. 2.]  
658     cord_individual_obj[indivial_i, :] = [5. 2. 1. 3.]  
659     cord_individual_obj[indivial_i, :] = [6. 3. 2. 5.]  
660     cord_individual_obj[indivial_i, :] = [7. 1. 1. 2.]  
661     cord_individual_obj[indivial_i, :] = [8. 1. 1. 2.]  
662     cord_individual_obj[indivial_i, :] = [9. 3. 1. 4.]  
663     cord_individual_obj[indivial_i, :] = [10. 2. 2. 4.]  
664     cord_individual_obj[indivial_i, :] = [11. 3. 1. 4.]  
665     cord_individual_obj[indivial_i, :] = [12. 2. 1. 3.]  
666     cord_individual_obj[indivial_i, :] = [13. 2. 1. 3.]  
667     cord_individual_obj[indivial_i, :] = [14. 3. 2. 5.]
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668 cord_individual_obj[indivial_i, :] = [15. 2. 2. 4.]
669 cord_individual_obj[indivial_i, :] = [16. 1. 1. 2.]
670 cord_individual_obj[indivial_i, :] = [17. 3. 2. 5.]
671 cord_individual_obj[indivial_i, :] = [18. 3. 1. 4.]
672 cord_individual_obj[indivial_i, :] = [19. 2. 1. 3.]
673 cord_individual_obj[indivial_i, :] = [20. 2. 2. 4.]
674 cord_individual_obj[indivial_i, :] = [21. 3. 2. 5.]
675 cord_individual_obj[indivial_i, :] = [22. 2. 1. 3.]
676 cord_individual_obj[indivial_i, :] = [23. 1. 1. 2.]
677 cord_individual_obj[indivial_i, :] = [24. 2. 2. 4.]
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 = 53.0
689 Proportion_of_area = 0.049074074074074076
690 BEST_CHROM =
691     berth: [ 2.5 20. 9. 15. 21. ]
692     time: [0. 0. 0. 0. 1.]
693     num_QC: [5. 5. 3. 3. 5.]
694 Objective function values and some other indicators:
695 Obj0 = 1.00          Obj1 = 1.00          Obj0 + Obj1 = 2.00
696 Total movement of crane: 0.00
697 Total waiting time in berth position: 1.00
698 Total index of q during berthing: 228.00
699 Specific arrangement for each vessel:
700
    V_id: 0           li: 5.0           xi: 2.5           bow of i: 0.0           tail of i: 5.0           gama_i0: 0.0           gama_i1: 1.0
    .0                 gama_i1 + 1: 2.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 160.0      work load_i:
160.0               work load gap_i: 0
701
    V_id: 1           li: 6.0           xi: 20.0           bow of i: 17.0           tail of i: 23.0           gama_i0: 0.0           gama_i1: 0
    .0                 gama_i1 + 1: 1.0      gama_i1 - gama_i0: 0.0      duration_time_i: 1.0      demand_i: 60.0      work
load_i: 60.0         work load gap_i: 0
702
    V_id: 2           li: 8.0           xi: 9.0            bow of i: 5.0           tail of i: 13.0           gama_i0: 0.0           gama_i1: 1.0
    .0                 gama_i1 + 1: 2.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 80.0      work load_i:
80.0               work load gap_i: 0
703
    V_id: 3           li: 4.0           xi: 15.0           bow of i: 13.0           tail of i: 17.0           gama_i0: 0.0           gama_i1: 1
    .0                 gama_i1 + 1: 2.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 120.0      work
load_i: 120.0        work load gap_i: 0
704
    V_id: 4           li: 8.0           xi: 21.0           bow of i: 17.0           tail of i: 25.0           gama_i0: 1.0           gama_i1: 1
    .0                 gama_i1 + 1: 2.0      gama_i1 - gama_i0: 0.0      duration_time_i: 1.0      demand_i: 60.0      work
load_i: 60.0         work load gap_i: 0
705
706 Algorithm finished and the total CPU time: 135 s
707 End
708

```