

unknown

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1 "E:\1\2\3\4\5\6\7\8\9\10\11\12\13\14\15\16\17\18\19\1_LW_2\6\2\1 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=30694
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1\2\3\4\5\6\7\8\9\10\11\12\13\14\15\16\17\18\19\1_LW_2\6\2\1 python code\01_My_Python_Code', 'E:/1\2\3\4\5\6\7\8\9\10\11\12\13\14\15\16\17\18\19\1_LW_2\6\2\1 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\2\3\4\5\6\7\8\9\10\11\12\13\14\15\16\17\18\19\1_LW_2\6\2\1 python code\01_My_Python_Code/main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1\2\3\4\5\6\7\8\9\10\11\12\13\14\15\16\17\18\19\1_LW_2\6\2\1 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_6_1_standerd_test.xlsx optimization process.
14
15 Start
16   Read basic data
17     V = 6
18     T = 36
19     Q = 23
20     L = 30
21 PSO parameter setting:
22   Trail = 27
23   maxIter_num = 30
24   W_inertia = 1.0
25   oder_type_num = 20
26   c1 = 1.0
27   c2 = 1.0
28   r1 = 0.1256808629550884
29   r2 = 0.1256808629550884
30 Begin iteration:
31
32 iter = 0
33   cord_individual_obj[individual_i, :] = [ 0.  4.  86.  90.]
34   cord_individual_obj[individual_i, :] = [ 1.  5.  48.  53.]
35   cord_individual_obj[individual_i, :] = [ 2.  4.  56.  60.]
36   cord_individual_obj[individual_i, :] = [ 3.  6.  46.  52.]
37   cord_individual_obj[individual_i, :] = [ 4.  6.  62.  68.]
38   cord_individual_obj[individual_i, :] = [ 5.  3.  102.  105.]
39   cord_individual_obj[individual_i, :] = [ 6.  4.  58.  62.]
40   cord_individual_obj[individual_i, :] = [ 7.  6.  16.  22.]
41   cord_individual_obj[individual_i, :] = [ 8.  3.  62.  65.]
42   cord_individual_obj[individual_i, :] = [ 9.  4.  72.  76.]
43   cord_individual_obj[individual_i, :] = [10.  4.  78.  82.]
44   cord_individual_obj[individual_i, :] = [11.  4.  34.  38.]
45   cord_individual_obj[individual_i, :] = [12.  4.  114.  118.]
46   cord_individual_obj[individual_i, :] = [13.  6.  24.  30.]
47   cord_individual_obj[individual_i, :] = [14.  4.  68.  72.]
48   cord_individual_obj[individual_i, :] = [15.  5.  62.  67.]
49   cord_individual_obj[individual_i, :] = [16.  4.  42.  46.]
50   cord_individual_obj[individual_i, :] = [17.  5.  22.  27.]
51   cord_individual_obj[individual_i, :] = [18.  5.  52.  57.]
52   cord_individual_obj[individual_i, :] = [19.  5.  138.  143.]
53
54 min(cord_individual_obj[:, 3]) = 22.0
55 histor1_G_best_iter[iter, 3] = 22.0
56 Begin iteration:
57
58 iter = 1
59   cord_individual_obj[individual_i, :] = [ 0.  4.  50.  54.]
60   cord_individual_obj[individual_i, :] = [ 1.  5.  44.  49.]
61   cord_individual_obj[individual_i, :] = [ 2.  4.  74.  78.]
62   cord_individual_obj[individual_i, :] = [ 3.  6.  8.  14.]
63   cord_individual_obj[individual_i, :] = [ 4.  4.  20.  24.]
64   cord_individual_obj[individual_i, :] = [ 5.  4.  92.  96.]
65   cord_individual_obj[individual_i, :] = [ 6.  4.  18.  22.]
66   cord_individual_obj[individual_i, :] = [ 7.  6.  20.  26.]
67   cord_individual_obj[individual_i, :] = [ 8.  3.  44.  47.]
68   cord_individual_obj[individual_i, :] = [ 9.  4.  78.  82.]
69   cord_individual_obj[individual_i, :] = [10.  6.  58.  64.]
70   cord_individual_obj[individual_i, :] = [11.  3.  34.  37.]
71   cord_individual_obj[individual_i, :] = [12.  4.  12.  16.]
72   cord_individual_obj[individual_i, :] = [13.  6.  8.  14.]
73   cord_individual_obj[individual_i, :] = [14.  4.  42.  46.]
74   cord_individual_obj[individual_i, :] = [15.  6.  34.  40.]
75   cord_individual_obj[individual_i, :] = [16.  4.  66.  70.]
76   cord_individual_obj[individual_i, :] = [17.  5.  76.  81.]
77   cord_individual_obj[individual_i, :] = [18.  4.  38.  42.]
78   cord_individual_obj[individual_i, :] = [19.  6.  16.  22.]
79

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unknown

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80 min(cord_individual_obj[:, 3]) = 14.0
81 historl_G_best_iter[iter, 3] = 14.0
82 Begin iteration:
83
84 iter = 2
85 cord_individual_obj[indivial_i, :] = [ 0.  5. 28. 33.]
86 cord_individual_obj[indivial_i, :] = [ 1.  5. 44. 49.]
87 cord_individual_obj[indivial_i, :] = [ 2.  4. 36. 40.]
88 cord_individual_obj[indivial_i, :] = [ 3.  6. 42. 48.]
89 cord_individual_obj[indivial_i, :] = [ 4.  4. 62. 66.]
90 cord_individual_obj[indivial_i, :] = [ 5.  6. 8. 14.]
91 cord_individual_obj[indivial_i, :] = [ 6.  4. 48. 52.]
92 cord_individual_obj[indivial_i, :] = [ 7.  6. 16. 22.]
93 cord_individual_obj[indivial_i, :] = [ 8.  4. 18. 22.]
94 cord_individual_obj[indivial_i, :] = [ 9.  4. 80. 84.]
95 cord_individual_obj[indivial_i, :] = [10. 5. 32. 37.]
96 cord_individual_obj[indivial_i, :] = [11. 4. 34. 38.]
97 cord_individual_obj[indivial_i, :] = [12. 4. 34. 38.]
98 cord_individual_obj[indivial_i, :] = [13. 6. 24. 30.]
99 cord_individual_obj[indivial_i, :] = [14. 5. 28. 33.]
100 cord_individual_obj[indivial_i, :] = [15. 4. 24. 28.]
101 cord_individual_obj[indivial_i, :] = [16. 4. 38. 42.]
102 cord_individual_obj[indivial_i, :] = [17. 6. 40. 46.]
103 cord_individual_obj[indivial_i, :] = [18. 6. 94. 100.]
104 cord_individual_obj[indivial_i, :] = [19. 5. 28. 33.]
105
106 min(cord_individual_obj[:, 3]) = 14.0
107 historl_G_best_iter[iter, 3] = 14.0
108 Begin iteration:
109
110 iter = 3
111 cord_individual_obj[indivial_i, :] = [ 0.  3. 80. 83.]
112 cord_individual_obj[indivial_i, :] = [ 1.  6. 34. 40.]
113 cord_individual_obj[indivial_i, :] = [ 2.  5. 46. 51.]
114 cord_individual_obj[indivial_i, :] = [ 3.  6. 38. 44.]
115 cord_individual_obj[indivial_i, :] = [ 4.  6. 32. 38.]
116 cord_individual_obj[indivial_i, :] = [ 5.  5. 42. 47.]
117 cord_individual_obj[indivial_i, :] = [ 6.  3. 98. 101.]
118 cord_individual_obj[indivial_i, :] = [ 7.  6. 46. 52.]
119 cord_individual_obj[indivial_i, :] = [ 8.  5. 38. 43.]
120 cord_individual_obj[indivial_i, :] = [ 9.  5. 28. 33.]
121 cord_individual_obj[indivial_i, :] = [10. 5. 28. 33.]
122 cord_individual_obj[indivial_i, :] = [11. 6. 46. 52.]
123 cord_individual_obj[indivial_i, :] = [12. 6. 68. 74.]
124 cord_individual_obj[indivial_i, :] = [13. 6. 32. 38.]
125 cord_individual_obj[indivial_i, :] = [14. 4. 28. 32.]
126 cord_individual_obj[indivial_i, :] = [15. 5. 38. 43.]
127 cord_individual_obj[indivial_i, :] = [16. 6. 46. 52.]
128 cord_individual_obj[indivial_i, :] = [17. 6. 32. 38.]
129 cord_individual_obj[indivial_i, :] = [18. 6. 8. 14.]
130 cord_individual_obj[indivial_i, :] = [19. 5. 52. 57.]
131
132 min(cord_individual_obj[:, 3]) = 14.0
133 historl_G_best_iter[iter, 3] = 14.0
134 Begin iteration:
135
136 iter = 4
137 cord_individual_obj[indivial_i, :] = [ 0.  6. 36. 42.]
138 cord_individual_obj[indivial_i, :] = [ 1.  6. 36. 42.]
139 cord_individual_obj[indivial_i, :] = [ 2.  5. 44. 49.]
140 cord_individual_obj[indivial_i, :] = [ 3.  6. 38. 44.]
141 cord_individual_obj[indivial_i, :] = [ 4.  6. 8. 14.]
142 cord_individual_obj[indivial_i, :] = [ 5.  5. 44. 49.]
143 cord_individual_obj[indivial_i, :] = [ 6.  6. 8. 14.]
144 cord_individual_obj[indivial_i, :] = [ 7.  6. 40. 46.]
145 cord_individual_obj[indivial_i, :] = [ 8.  5. 26. 31.]
146 cord_individual_obj[indivial_i, :] = [ 9.  5. 36. 41.]
147 cord_individual_obj[indivial_i, :] = [10. 6. 26. 32.]
148 cord_individual_obj[indivial_i, :] = [11. 3. 84. 87.]
149 cord_individual_obj[indivial_i, :] = [12. 5. 36. 41.]
150 cord_individual_obj[indivial_i, :] = [13. 6. 32. 38.]
151 cord_individual_obj[indivial_i, :] = [14. 5. 28. 33.]
152 cord_individual_obj[indivial_i, :] = [15. 5. 48. 53.]
153 cord_individual_obj[indivial_i, :] = [16. 6. 8. 14.]
154 cord_individual_obj[indivial_i, :] = [17. 6. 32. 38.]
155 cord_individual_obj[indivial_i, :] = [18. 4. 60. 64.]
156 cord_individual_obj[indivial_i, :] = [19. 5. 20. 25.]
157
158 min(cord_individual_obj[:, 3]) = 14.0
159 historl_G_best_iter[iter, 3] = 14.0
160 Begin iteration:
161
162 iter = 5
163 cord_individual_obj[indivial_i, :] = [ 0.  3. 44. 47.]
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164 cord_individual_obj[indivial_i,:] = [ 1. 6. 26. 32.]
165 cord_individual_obj[indivial_i,:] = [ 2. 6. 38. 44.]
166 cord_individual_obj[indivial_i,:] = [ 3. 6. 38. 44.]
167 cord_individual_obj[indivial_i,:] = [ 4. 6. 32. 38.]
168 cord_individual_obj[indivial_i,:] = [ 5. 5. 60. 65.]
169 cord_individual_obj[indivial_i,:] = [ 6. 6. 38. 44.]
170 cord_individual_obj[indivial_i,:] = [ 7. 6. 32. 38.]
171 cord_individual_obj[indivial_i,:] = [ 8. 6. 24. 30.]
172 cord_individual_obj[indivial_i,:] = [ 9. 5. 28. 33.]
173 cord_individual_obj[indivial_i,:] = [10. 4. 44. 48.]
174 cord_individual_obj[indivial_i,:] = [11. 6. 8. 14.]
175 cord_individual_obj[indivial_i,:] = [12. 6. 38. 44.]
176 cord_individual_obj[indivial_i,:] = [13. 6. 44. 50.]
177 cord_individual_obj[indivial_i,:] = [14. 4. 28. 32.]
178 cord_individual_obj[indivial_i,:] = [15. 5. 24. 29.]
179 cord_individual_obj[indivial_i,:] = [16. 6. 32. 38.]
180 cord_individual_obj[indivial_i,:] = [17. 6. 24. 30.]
181 cord_individual_obj[indivial_i,:] = [18. 3. 84. 87.]
182 cord_individual_obj[indivial_i,:] = [19. 6. 28. 34.]
183
184 min(cord_individual_obj[:,3]) = 14.0
185 historl_G_best_iter[iter,3] = 14.0
186 Begin iteration:
187
188 iter = 6
189 cord_individual_obj[indivial_i,:] = [ 0. 4. 110. 114.]
190 cord_individual_obj[indivial_i,:] = [ 1. 6. 26. 32.]
191 cord_individual_obj[indivial_i,:] = [ 2. 5. 32. 37.]
192 cord_individual_obj[indivial_i,:] = [ 3. 6. 38. 44.]
193 cord_individual_obj[indivial_i,:] = [ 4. 5. 12. 17.]
194 cord_individual_obj[indivial_i,:] = [ 5. 6. 38. 44.]
195 cord_individual_obj[indivial_i,:] = [ 6. 5. 28. 33.]
196 cord_individual_obj[indivial_i,:] = [ 7. 6. 66. 72.]
197 cord_individual_obj[indivial_i,:] = [ 8. 5. 24. 29.]
198 cord_individual_obj[indivial_i,:] = [ 9. 5. 28. 33.]
199 cord_individual_obj[indivial_i,:] = [10. 3. 40. 43.]
200 cord_individual_obj[indivial_i,:] = [11. 5. 44. 49.]
201 cord_individual_obj[indivial_i,:] = [12. 5. 58. 63.]
202 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
203 cord_individual_obj[indivial_i,:] = [14. 5. 52. 57.]
204 cord_individual_obj[indivial_i,:] = [15. 6. 78. 84.]
205 cord_individual_obj[indivial_i,:] = [16. 6. 12. 18.]
206 cord_individual_obj[indivial_i,:] = [17. 6. 92. 98.]
207 cord_individual_obj[indivial_i,:] = [18. 6. 8. 14.]
208 cord_individual_obj[indivial_i,:] = [19. 6. 54. 60.]
209
210 min(cord_individual_obj[:,3]) = 14.0
211 historl_G_best_iter[iter,3] = 14.0
212 Begin iteration:
213
214 iter = 7
215 cord_individual_obj[indivial_i,:] = [ 0. 6. 8. 14.]
216 cord_individual_obj[indivial_i,:] = [ 1. 6. 38. 44.]
217 cord_individual_obj[indivial_i,:] = [ 2. 5. 78. 83.]
218 cord_individual_obj[indivial_i,:] = [ 3. 6. 38. 44.]
219 cord_individual_obj[indivial_i,:] = [ 4. 6. 38. 44.]
220 cord_individual_obj[indivial_i,:] = [ 5. 5. 46. 51.]
221 cord_individual_obj[indivial_i,:] = [ 6. 5. 68. 73.]
222 cord_individual_obj[indivial_i,:] = [ 7. 6. 60. 66.]
223 cord_individual_obj[indivial_i,:] = [ 8. 5. 46. 51.]
224 cord_individual_obj[indivial_i,:] = [ 9. 6. 28. 34.]
225 cord_individual_obj[indivial_i,:] = [10. 4. 28. 32.]
226 cord_individual_obj[indivial_i,:] = [11. 5. 28. 33.]
227 cord_individual_obj[indivial_i,:] = [12. 6. 60. 66.]
228 cord_individual_obj[indivial_i,:] = [13. 6. 60. 66.]
229 cord_individual_obj[indivial_i,:] = [14. 6. 28. 34.]
230 cord_individual_obj[indivial_i,:] = [15. 4. 74. 78.]
231 cord_individual_obj[indivial_i,:] = [16. 6. 38. 44.]
232 cord_individual_obj[indivial_i,:] = [17. 6. 28. 34.]
233 cord_individual_obj[indivial_i,:] = [18. 6. 48. 54.]
234 cord_individual_obj[indivial_i,:] = [19. 6. 28. 34.]
235
236 min(cord_individual_obj[:,3]) = 14.0
237 historl_G_best_iter[iter,3] = 14.0
238 Begin iteration:
239
240 iter = 8
241 cord_individual_obj[indivial_i,:] = [ 0. 5. 164. 169.]
242 cord_individual_obj[indivial_i,:] = [ 1. 6. 22. 28.]
243 cord_individual_obj[indivial_i,:] = [ 2. 6. 8. 14.]
244 cord_individual_obj[indivial_i,:] = [ 3. 6. 12. 18.]
245 cord_individual_obj[indivial_i,:] = [ 4. 5. 12. 17.]
246 cord_individual_obj[indivial_i,:] = [ 5. 6. 8. 14.]
247 cord_individual_obj[indivial_i,:] = [ 6. 5. 36. 41.]

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248 cord_individual_obj[indivial_i,:] = [ 7. 6. 12. 18.]
249 cord_individual_obj[indivial_i,:] = [ 8. 6. 92. 98.]
250 cord_individual_obj[indivial_i,:] = [ 9. 6. 8. 14.]
251 cord_individual_obj[indivial_i,:] = [10. 6. 26. 32.]
252 cord_individual_obj[indivial_i,:] = [11. 5. 20. 25.]
253 cord_individual_obj[indivial_i,:] = [12. 5. 70. 75.]
254 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
255 cord_individual_obj[indivial_i,:] = [14. 6. 8. 14.]
256 cord_individual_obj[indivial_i,:] = [15. 4. 24. 28.]
257 cord_individual_obj[indivial_i,:] = [16. 6. 8. 14.]
258 cord_individual_obj[indivial_i,:] = [17. 6. 24. 30.]
259 cord_individual_obj[indivial_i,:] = [18. 5. 78. 83.]
260 cord_individual_obj[indivial_i,:] = [19. 6. 44. 50.]
261
262 min(cord_individual_obj[:,3]) = 14.0
263 historl_G_best_iter[iter,3] = 14.0
264 Begin iteration:
265
266 iter = 9
267 cord_individual_obj[indivial_i,:] = [ 0. 6. 8. 14.]
268 cord_individual_obj[indivial_i,:] = [ 1. 6. 38. 44.]
269 cord_individual_obj[indivial_i,:] = [ 2. 5. 74. 79.]
270 cord_individual_obj[indivial_i,:] = [ 3. 6. 38. 44.]
271 cord_individual_obj[indivial_i,:] = [ 4. 6. 38. 44.]
272 cord_individual_obj[indivial_i,:] = [ 5. 6. 60. 66.]
273 cord_individual_obj[indivial_i,:] = [ 6. 5. 78. 83.]
274 cord_individual_obj[indivial_i,:] = [ 7. 6. 38. 44.]
275 cord_individual_obj[indivial_i,:] = [ 8. 5. 74. 79.]
276 cord_individual_obj[indivial_i,:] = [ 9. 6. 28. 34.]
277 cord_individual_obj[indivial_i,:] = [10. 3. 78. 81.]
278 cord_individual_obj[indivial_i,:] = [11. 6. 48. 54.]
279 cord_individual_obj[indivial_i,:] = [12. 6. 38. 44.]
280 cord_individual_obj[indivial_i,:] = [13. 6. 60. 66.]
281 cord_individual_obj[indivial_i,:] = [14. 6. 28. 34.]
282 cord_individual_obj[indivial_i,:] = [15. 5. 74. 79.]
283 cord_individual_obj[indivial_i,:] = [16. 6. 38. 44.]
284 cord_individual_obj[indivial_i,:] = [17. 6. 28. 34.]
285 cord_individual_obj[indivial_i,:] = [18. 6. 48. 54.]
286 cord_individual_obj[indivial_i,:] = [19. 6. 48. 54.]
287
288 min(cord_individual_obj[:,3]) = 14.0
289 historl_G_best_iter[iter,3] = 14.0
290 Begin iteration:
291
292 iter = 10
293 cord_individual_obj[indivial_i,:] = [ 0. 5. 38. 43.]
294 cord_individual_obj[indivial_i,:] = [ 1. 6. 22. 28.]
295 cord_individual_obj[indivial_i,:] = [ 2. 5. 24. 29.]
296 cord_individual_obj[indivial_i,:] = [ 3. 6. 12. 18.]
297 cord_individual_obj[indivial_i,:] = [ 4. 6. 12. 18.]
298 cord_individual_obj[indivial_i,:] = [ 5. 5. 22. 27.]
299 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
300 cord_individual_obj[indivial_i,:] = [ 7. 6. 20. 26.]
301 cord_individual_obj[indivial_i,:] = [ 8. 5. 98. 103.]
302 cord_individual_obj[indivial_i,:] = [ 9. 6. 12. 18.]
303 cord_individual_obj[indivial_i,:] = [10. 4. 50. 54.]
304 cord_individual_obj[indivial_i,:] = [11. 6. 12. 18.]
305 cord_individual_obj[indivial_i,:] = [12. 6. 52. 58.]
306 cord_individual_obj[indivial_i,:] = [13. 6. 8. 14.]
307 cord_individual_obj[indivial_i,:] = [14. 6. 14. 20.]
308 cord_individual_obj[indivial_i,:] = [15. 4. 116. 120.]
309 cord_individual_obj[indivial_i,:] = [16. 6. 8. 14.]
310 cord_individual_obj[indivial_i,:] = [17. 6. 32. 38.]
311 cord_individual_obj[indivial_i,:] = [18. 3. 84. 87.]
312 cord_individual_obj[indivial_i,:] = [19. 5. 24. 29.]
313
314 min(cord_individual_obj[:,3]) = 14.0
315 historl_G_best_iter[iter,3] = 14.0
316 Begin iteration:
317
318 iter = 11
319 cord_individual_obj[indivial_i,:] = [ 0. 4. 60. 64.]
320 cord_individual_obj[indivial_i,:] = [ 1. 6. 38. 44.]
321 cord_individual_obj[indivial_i,:] = [ 2. 5. 36. 41.]
322 cord_individual_obj[indivial_i,:] = [ 3. 6. 38. 44.]
323 cord_individual_obj[indivial_i,:] = [ 4. 5. 68. 73.]
324 cord_individual_obj[indivial_i,:] = [ 5. 5. 58. 63.]
325 cord_individual_obj[indivial_i,:] = [ 6. 5. 94. 99.]
326 cord_individual_obj[indivial_i,:] = [ 7. 6. 38. 44.]
327 cord_individual_obj[indivial_i,:] = [ 8. 6. 38. 44.]
328 cord_individual_obj[indivial_i,:] = [ 9. 6. 28. 34.]
329 cord_individual_obj[indivial_i,:] = [10. 5. 48. 53.]
330 cord_individual_obj[indivial_i,:] = [11. 6. 28. 34.]
331 cord_individual_obj[indivial_i,:] = [12. 5. 88. 93.]

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332 cord_individual_obj[indivial_i,:] = [13. 6. 60. 66.]
333 cord_individual_obj[indivial_i,:] = [14. 6. 28. 34.]
334 cord_individual_obj[indivial_i,:] = [15. 6. 8. 14.]
335 cord_individual_obj[indivial_i,:] = [16. 6. 38. 44.]
336 cord_individual_obj[indivial_i,:] = [17. 6. 48. 54.]
337 cord_individual_obj[indivial_i,:] = [18. 6. 76. 82.]
338 cord_individual_obj[indivial_i,:] = [19. 6. 30. 36.]
339

340 min(cord_individual_obj[:,3]) = 14.0
341 historl_G_best_iter[iter,3] = 14.0
342 Begin iteration:
343
344 iter = 12
345 cord_individual_obj[indivial_i,:] = [ 0. 5. 102. 107.]
346 cord_individual_obj[indivial_i,:] = [ 1. 6. 26. 32.]
347 cord_individual_obj[indivial_i,:] = [ 2. 6. 38. 44.]
348 cord_individual_obj[indivial_i,:] = [ 3. 6. 24. 30.]
349 cord_individual_obj[indivial_i,:] = [ 4. 5. 24. 29.]
350 cord_individual_obj[indivial_i,:] = [ 5. 6. 38. 44.]
351 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
352 cord_individual_obj[indivial_i,:] = [ 7. 6. 60. 66.]
353 cord_individual_obj[indivial_i,:] = [ 8. 5. 98. 103.]
354 cord_individual_obj[indivial_i,:] = [ 9. 6. 24. 30.]
355 cord_individual_obj[indivial_i,:] = [10. 4. 58. 62.]
356 cord_individual_obj[indivial_i,:] = [11. 5. 28. 33.]
357 cord_individual_obj[indivial_i,:] = [12. 5. 68. 73.]
358 cord_individual_obj[indivial_i,:] = [13. 6. 44. 50.]
359 cord_individual_obj[indivial_i,:] = [14. 6. 52. 58.]
360 cord_individual_obj[indivial_i,:] = [15. 4. 110. 114.]
361 cord_individual_obj[indivial_i,:] = [16. 6. 24. 30.]
362 cord_individual_obj[indivial_i,:] = [17. 6. 32. 38.]
363 cord_individual_obj[indivial_i,:] = [18. 5. 64. 69.]
364 cord_individual_obj[indivial_i,:] = [19. 5. 28. 33.]
365
366 min(cord_individual_obj[:,3]) = 14.0
367 historl_G_best_iter[iter,3] = 14.0
368 Begin iteration:
369
370 iter = 13
371 cord_individual_obj[indivial_i,:] = [ 0. 3. 108. 111.]
372 cord_individual_obj[indivial_i,:] = [ 1. 6. 38. 44.]
373 cord_individual_obj[indivial_i,:] = [ 2. 5. 46. 51.]
374 cord_individual_obj[indivial_i,:] = [ 3. 6. 38. 44.]
375 cord_individual_obj[indivial_i,:] = [ 4. 6. 38. 44.]
376 cord_individual_obj[indivial_i,:] = [ 5. 5. 94. 99.]
377 cord_individual_obj[indivial_i,:] = [ 6. 5. 116. 121.]
378 cord_individual_obj[indivial_i,:] = [ 7. 6. 38. 44.]
379 cord_individual_obj[indivial_i,:] = [ 8. 5. 38. 43.]
380 cord_individual_obj[indivial_i,:] = [ 9. 6. 28. 34.]
381 cord_individual_obj[indivial_i,:] = [10. 5. 28. 33.]
382 cord_individual_obj[indivial_i,:] = [11. 6. 48. 54.]
383 cord_individual_obj[indivial_i,:] = [12. 5. 94. 99.]
384 cord_individual_obj[indivial_i,:] = [13. 6. 38. 44.]
385 cord_individual_obj[indivial_i,:] = [14. 6. 28. 34.]
386 cord_individual_obj[indivial_i,:] = [15. 6. 8. 14.]
387 cord_individual_obj[indivial_i,:] = [16. 6. 24. 30.]
388 cord_individual_obj[indivial_i,:] = [17. 6. 28. 34.]
389 cord_individual_obj[indivial_i,:] = [18. 4. 68. 72.]
390 cord_individual_obj[indivial_i,:] = [19. 5. 48. 53.]
391
392 min(cord_individual_obj[:,3]) = 14.0
393 historl_G_best_iter[iter,3] = 14.0
394 Begin iteration:
395
396 iter = 14
397 cord_individual_obj[indivial_i,:] = [ 0. 4. 66. 70.]
398 cord_individual_obj[indivial_i,:] = [ 1. 6. 38. 44.]
399 cord_individual_obj[indivial_i,:] = [ 2. 5. 58. 63.]
400 cord_individual_obj[indivial_i,:] = [ 3. 6. 24. 30.]
401 cord_individual_obj[indivial_i,:] = [ 4. 5. 58. 63.]
402 cord_individual_obj[indivial_i,:] = [ 5. 5. 38. 43.]
403 cord_individual_obj[indivial_i,:] = [ 6. 6. 8. 14.]
404 cord_individual_obj[indivial_i,:] = [ 7. 6. 60. 66.]
405 cord_individual_obj[indivial_i,:] = [ 8. 5. 74. 79.]
406 cord_individual_obj[indivial_i,:] = [ 9. 6. 28. 34.]
407 cord_individual_obj[indivial_i,:] = [10. 3. 48. 51.]
408 cord_individual_obj[indivial_i,:] = [11. 6. 52. 58.]
409 cord_individual_obj[indivial_i,:] = [12. 6. 38. 44.]
410 cord_individual_obj[indivial_i,:] = [13. 6. 38. 44.]
411 cord_individual_obj[indivial_i,:] = [14. 6. 28. 34.]
412 cord_individual_obj[indivial_i,:] = [15. 6. 38. 44.]
413 cord_individual_obj[indivial_i,:] = [16. 6. 38. 44.]
414 cord_individual_obj[indivial_i,:] = [17. 6. 28. 34.]
415 cord_individual_obj[indivial_i,:] = [18. 6. 60. 66.]

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unknown

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416     cord_individual_obj[indivial_i, :] = [19. 6. 48. 54.]  
417  
418     min(cord_individual_obj[:, 3]) = 14.0  
419     historl_G_best_iter[iter, 3] = 14.0  
420 Begin iteration:  
421  
422 iter = 15  
423     cord_individual_obj[indivial_i, :] = [ 0. 5. 98. 103.]  
424     cord_individual_obj[indivial_i, :] = [ 1. 6. 24. 30.]  
425     cord_individual_obj[indivial_i, :] = [ 2. 6. 38. 44.]  
426     cord_individual_obj[indivial_i, :] = [ 3. 6. 24. 30.]  
427     cord_individual_obj[indivial_i, :] = [ 4. 6. 24. 30.]  
428     cord_individual_obj[indivial_i, :] = [ 5. 5. 56. 61.]  
429     cord_individual_obj[indivial_i, :] = [ 6. 5. 46. 51.]  
430     cord_individual_obj[indivial_i, :] = [ 7. 6. 38. 44.]  
431     cord_individual_obj[indivial_i, :] = [ 8. 6. 8. 14.]  
432     cord_individual_obj[indivial_i, :] = [ 9. 6. 28. 34.]  
433     cord_individual_obj[indivial_i, :] = [10. 6. 100. 106.]  
434     cord_individual_obj[indivial_i, :] = [11. 5. 48. 53.]  
435     cord_individual_obj[indivial_i, :] = [12. 6. 60. 66.]  
436     cord_individual_obj[indivial_i, :] = [13. 6. 44. 50.]  
437     cord_individual_obj[indivial_i, :] = [14. 6. 28. 34.]  
438     cord_individual_obj[indivial_i, :] = [15. 5. 58. 63.]  
439     cord_individual_obj[indivial_i, :] = [16. 6. 38. 44.]  
440     cord_individual_obj[indivial_i, :] = [17. 6. 48. 54.]  
441     cord_individual_obj[indivial_i, :] = [18. 4. 72. 76.]  
442     cord_individual_obj[indivial_i, :] = [19. 5. 84. 89.]  
443  
444 min(cord_individual_obj[:, 3]) = 14.0  
445 historl_G_best_iter[iter, 3] = 14.0  
446 Begin iteration:  
447  
448 iter = 16  
449     cord_individual_obj[indivial_i, :] = [ 0. 4. 34. 38.]  
450     cord_individual_obj[indivial_i, :] = [ 1. 6. 28. 34.]  
451     cord_individual_obj[indivial_i, :] = [ 2. 6. 8. 14.]  
452     cord_individual_obj[indivial_i, :] = [ 3. 6. 8. 14.]  
453     cord_individual_obj[indivial_i, :] = [ 4. 5. 40. 45.]  
454     cord_individual_obj[indivial_i, :] = [ 5. 5. 44. 49.]  
455     cord_individual_obj[indivial_i, :] = [ 6. 5. 28. 33.]  
456     cord_individual_obj[indivial_i, :] = [ 7. 6. 8. 14.]  
457     cord_individual_obj[indivial_i, :] = [ 8. 5. 46. 51.]  
458     cord_individual_obj[indivial_i, :] = [ 9. 6. 8. 14.]  
459     cord_individual_obj[indivial_i, :] = [10. 6. 8. 14.]  
460     cord_individual_obj[indivial_i, :] = [11. 5. 70. 75.]  
461     cord_individual_obj[indivial_i, :] = [12. 5. 36. 41.]  
462     cord_individual_obj[indivial_i, :] = [13. 6. 8. 14.]  
463     cord_individual_obj[indivial_i, :] = [14. 6. 96. 102.]  
464     cord_individual_obj[indivial_i, :] = [15. 4. 58. 62.]  
465     cord_individual_obj[indivial_i, :] = [16. 6. 8. 14.]  
466     cord_individual_obj[indivial_i, :] = [17. 6. 28. 34.]  
467     cord_individual_obj[indivial_i, :] = [18. 6. 56. 62.]  
468     cord_individual_obj[indivial_i, :] = [19. 5. 8. 13.]  
469  
470 min(cord_individual_obj[:, 3]) = 13.0  
471 historl_G_best_iter[iter, 3] = 13.0  
472 Begin iteration:  
473  
474 iter = 17  
475     cord_individual_obj[indivial_i, :] = [ 0. 5. 58. 63.]  
476     cord_individual_obj[indivial_i, :] = [ 1. 5. 48. 53.]  
477     cord_individual_obj[indivial_i, :] = [ 2. 5. 58. 63.]  
478     cord_individual_obj[indivial_i, :] = [ 3. 5. 68. 73.]  
479     cord_individual_obj[indivial_i, :] = [ 4. 5. 44. 49.]  
480     cord_individual_obj[indivial_i, :] = [ 5. 5. 68. 73.]  
481     cord_individual_obj[indivial_i, :] = [ 6. 5. 60. 65.]  
482     cord_individual_obj[indivial_i, :] = [ 7. 5. 68. 73.]  
483     cord_individual_obj[indivial_i, :] = [ 8. 5. 44. 49.]  
484     cord_individual_obj[indivial_i, :] = [ 9. 5. 58. 63.]  
485     cord_individual_obj[indivial_i, :] = [10. 4. 48. 52.]  
486     cord_individual_obj[indivial_i, :] = [11. 5. 48. 53.]  
487     cord_individual_obj[indivial_i, :] = [12. 5. 60. 65.]  
488     cord_individual_obj[indivial_i, :] = [13. 5. 82. 87.]  
489     cord_individual_obj[indivial_i, :] = [14. 5. 8. 13.]  
490     cord_individual_obj[indivial_i, :] = [15. 5. 68. 73.]  
491     cord_individual_obj[indivial_i, :] = [16. 5. 68. 73.]  
492     cord_individual_obj[indivial_i, :] = [17. 5. 38. 43.]  
493     cord_individual_obj[indivial_i, :] = [18. 4. 50. 54.]  
494     cord_individual_obj[indivial_i, :] = [19. 5. 46. 51.]  
495  
496 min(cord_individual_obj[:, 3]) = 13.0  
497 historl_G_best_iter[iter, 3] = 13.0  
498 Begin iteration:  
499
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500 iter = 18
501 cord_individual_obj[indivial_i, :] = [ 0.  4. 58. 62.]
502 cord_individual_obj[indivial_i, :] = [ 1.  5. 68. 73.]
503 cord_individual_obj[indivial_i, :] = [ 2.  5. 58. 63.]
504 cord_individual_obj[indivial_i, :] = [ 3.  5. 88. 93.]
505 cord_individual_obj[indivial_i, :] = [ 4.  5. 52. 57.]
506 cord_individual_obj[indivial_i, :] = [ 5.  5. 98. 103.]
507 cord_individual_obj[indivial_i, :] = [ 6.  5. 82. 87.]
508 cord_individual_obj[indivial_i, :] = [ 7.  5. 52. 57.]
509 cord_individual_obj[indivial_i, :] = [ 8.  5. 52. 57.]
510 cord_individual_obj[indivial_i, :] = [ 9.  5. 58. 63.]
511 cord_individual_obj[indivial_i, :] = [10. 5. 52. 57.]
512 cord_individual_obj[indivial_i, :] = [11. 5. 28. 33.]
513 cord_individual_obj[indivial_i, :] = [12. 5. 96. 101.]
514 cord_individual_obj[indivial_i, :] = [13. 5. 8. 13.]
515 cord_individual_obj[indivial_i, :] = [14. 4. 58. 62.]
516 cord_individual_obj[indivial_i, :] = [15. 4. 68. 72.]
517 cord_individual_obj[indivial_i, :] = [16. 5. 82. 87.]
518 cord_individual_obj[indivial_i, :] = [17. 5. 38. 43.]
519 cord_individual_obj[indivial_i, :] = [18. 4. 50. 54.]
520 cord_individual_obj[indivial_i, :] = [19. 5. 76. 81.]
521
522 min(cord_individual_obj[:, 3]) = 13.0
523 historl_G_best_iter[iter, 3] = 13.0
524 Begin iteration:
525
526 iter = 19
527 cord_individual_obj[indivial_i, :] = [ 0.  5. 58. 63.]
528 cord_individual_obj[indivial_i, :] = [ 1.  5. 86. 91.]
529 cord_individual_obj[indivial_i, :] = [ 2.  5. 68. 73.]
530 cord_individual_obj[indivial_i, :] = [ 3.  5. 88. 93.]
531 cord_individual_obj[indivial_i, :] = [ 4.  5. 72. 77.]
532 cord_individual_obj[indivial_i, :] = [ 5.  5. 8. 13.]
533 cord_individual_obj[indivial_i, :] = [ 6.  5. 64. 69.]
534 cord_individual_obj[indivial_i, :] = [ 7.  5. 82. 87.]
535 cord_individual_obj[indivial_i, :] = [ 8.  5. 60. 65.]
536 cord_individual_obj[indivial_i, :] = [ 9.  5. 58. 63.]
537 cord_individual_obj[indivial_i, :] = [10. 5. 56. 61.]
538 cord_individual_obj[indivial_i, :] = [11. 5. 56. 61.]
539 cord_individual_obj[indivial_i, :] = [12. 5. 60. 65.]
540 cord_individual_obj[indivial_i, :] = [13. 5. 82. 87.]
541 cord_individual_obj[indivial_i, :] = [14. 5. 38. 43.]
542 cord_individual_obj[indivial_i, :] = [15. 5. 78. 83.]
543 cord_individual_obj[indivial_i, :] = [16. 5. 82. 87.]
544 cord_individual_obj[indivial_i, :] = [17. 5. 46. 51.]
545 cord_individual_obj[indivial_i, :] = [18. 5. 68. 73.]
546 cord_individual_obj[indivial_i, :] = [19. 5. 76. 81.]
547
548 min(cord_individual_obj[:, 3]) = 13.0
549 historl_G_best_iter[iter, 3] = 13.0
550 Begin iteration:
551
552 iter = 20
553 cord_individual_obj[indivial_i, :] = [ 0.  6. 44. 50.]
554 cord_individual_obj[indivial_i, :] = [ 1.  5. 54. 59.]
555 cord_individual_obj[indivial_i, :] = [ 2.  5. 22. 27.]
556 cord_individual_obj[indivial_i, :] = [ 3.  5. 8. 13.]
557 cord_individual_obj[indivial_i, :] = [ 4.  5. 26. 31.]
558 cord_individual_obj[indivial_i, :] = [ 5.  5. 68. 73.]
559 cord_individual_obj[indivial_i, :] = [ 6.  6. 70. 76.]
560 cord_individual_obj[indivial_i, :] = [ 7.  5. 12. 17.]
561 cord_individual_obj[indivial_i, :] = [ 8.  5. 22. 27.]
562 cord_individual_obj[indivial_i, :] = [ 9.  5. 70. 75.]
563 cord_individual_obj[indivial_i, :] = [10. 4. 90. 94.]
564 cord_individual_obj[indivial_i, :] = [11. 5. 12. 17.]
565 cord_individual_obj[indivial_i, :] = [12. 5. 78. 83.]
566 cord_individual_obj[indivial_i, :] = [13. 5. 8. 13.]
567 cord_individual_obj[indivial_i, :] = [14. 5. 48. 53.]
568 cord_individual_obj[indivial_i, :] = [15. 4. 50. 54.]
569 cord_individual_obj[indivial_i, :] = [16. 5. 8. 13.]
570 cord_individual_obj[indivial_i, :] = [17. 5. 32. 37.]
571 cord_individual_obj[indivial_i, :] = [18. 5. 26. 31.]
572 cord_individual_obj[indivial_i, :] = [19. 5. 24. 29.]
573
574 min(cord_individual_obj[:, 3]) = 13.0
575 historl_G_best_iter[iter, 3] = 13.0
576 Begin iteration:
577
578 iter = 21
579 cord_individual_obj[indivial_i, :] = [ 0.  6. 80. 86.]
580 cord_individual_obj[indivial_i, :] = [ 1.  5. 40. 45.]
581 cord_individual_obj[indivial_i, :] = [ 2.  5. 58. 63.]
582 cord_individual_obj[indivial_i, :] = [ 3.  5. 86. 91.]
583 cord_individual_obj[indivial_i, :] = [ 4.  5. 60. 65.]

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584 cord_individual_obj[indivial_i,:] = [ 5. 5. 58. 63.]
585 cord_individual_obj[indivial_i,:] = [ 6. 6. 60. 66.]
586 cord_individual_obj[indivial_i,:] = [ 7. 5. 82. 87.]
587 cord_individual_obj[indivial_i,:] = [ 8. 5. 58. 63.]
588 cord_individual_obj[indivial_i,:] = [ 9. 5. 38. 43.]
589 cord_individual_obj[indivial_i,:] = [10. 5. 8. 13.]
590 cord_individual_obj[indivial_i,:] = [11. 5. 48. 53.]
591 cord_individual_obj[indivial_i,:] = [12. 5. 96. 101.]
592 cord_individual_obj[indivial_i,:] = [13. 5. 82. 87.]
593 cord_individual_obj[indivial_i,:] = [14. 4. 48. 52.]
594 cord_individual_obj[indivial_i,:] = [15. 5. 58. 63.]
595 cord_individual_obj[indivial_i,:] = [16. 5. 82. 87.]
596 cord_individual_obj[indivial_i,:] = [17. 5. 28. 33.]
597 cord_individual_obj[indivial_i,:] = [18. 5. 28. 33.]
598 cord_individual_obj[indivial_i,:] = [19. 5. 54. 59.]
599

600 min(cord_individual_obj[:,3]) = 13.0
601 historl_G_best_iter[iter,3] = 13.0
602 Begin iteration:
603
604 iter = 22
605 cord_individual_obj[indivial_i,:] = [ 0. 6. 80. 86.]
606 cord_individual_obj[indivial_i,:] = [ 1. 5. 56. 61.]
607 cord_individual_obj[indivial_i,:] = [ 2. 5. 32. 37.]
608 cord_individual_obj[indivial_i,:] = [ 3. 5. 76. 81.]
609 cord_individual_obj[indivial_i,:] = [ 4. 5. 52. 57.]
610 cord_individual_obj[indivial_i,:] = [ 5. 5. 58. 63.]
611 cord_individual_obj[indivial_i,:] = [ 6. 5. 70. 75.]
612 cord_individual_obj[indivial_i,:] = [ 7. 5. 80. 85.]
613 cord_individual_obj[indivial_i,:] = [ 8. 5. 60. 65.]
614 cord_individual_obj[indivial_i,:] = [ 9. 5. 64. 69.]
615 cord_individual_obj[indivial_i,:] = [10. 3. 116. 119.]
616 cord_individual_obj[indivial_i,:] = [11. 5. 28. 33.]
617 cord_individual_obj[indivial_i,:] = [12. 5. 8. 13.]
618 cord_individual_obj[indivial_i,:] = [13. 5. 24. 29.]
619 cord_individual_obj[indivial_i,:] = [14. 5. 28. 33.]
620 cord_individual_obj[indivial_i,:] = [15. 5. 52. 57.]
621 cord_individual_obj[indivial_i,:] = [16. 5. 60. 65.]
622 cord_individual_obj[indivial_i,:] = [17. 5. 32. 37.]
623 cord_individual_obj[indivial_i,:] = [18. 4. 74. 78.]
624 cord_individual_obj[indivial_i,:] = [19. 5. 38. 43.]
625
626 min(cord_individual_obj[:,3]) = 13.0
627 historl_G_best_iter[iter,3] = 13.0
628 Begin iteration:
629
630 iter = 23
631 cord_individual_obj[indivial_i,:] = [ 0. 4. 88. 92.]
632 cord_individual_obj[indivial_i,:] = [ 1. 5. 86. 91.]
633 cord_individual_obj[indivial_i,:] = [ 2. 5. 68. 73.]
634 cord_individual_obj[indivial_i,:] = [ 3. 5. 86. 91.]
635 cord_individual_obj[indivial_i,:] = [ 4. 5. 78. 83.]
636 cord_individual_obj[indivial_i,:] = [ 5. 5. 104. 109.]
637 cord_individual_obj[indivial_i,:] = [ 6. 5. 88. 93.]
638 cord_individual_obj[indivial_i,:] = [ 7. 5. 116. 121.]
639 cord_individual_obj[indivial_i,:] = [ 8. 5. 68. 73.]
640 cord_individual_obj[indivial_i,:] = [ 9. 5. 58. 63.]
641 cord_individual_obj[indivial_i,:] = [10. 5. 8. 13.]
642 cord_individual_obj[indivial_i,:] = [11. 5. 28. 33.]
643 cord_individual_obj[indivial_i,:] = [12. 5. 68. 73.]
644 cord_individual_obj[indivial_i,:] = [13. 5. 82. 87.]
645 cord_individual_obj[indivial_i,:] = [14. 4. 28. 32.]
646 cord_individual_obj[indivial_i,:] = [15. 4. 68. 72.]
647 cord_individual_obj[indivial_i,:] = [16. 5. 84. 89.]
648 cord_individual_obj[indivial_i,:] = [17. 5. 46. 51.]
649 cord_individual_obj[indivial_i,:] = [18. 3. 60. 63.]
650 cord_individual_obj[indivial_i,:] = [19. 5. 76. 81.]
651
652 min(cord_individual_obj[:,3]) = 13.0
653 historl_G_best_iter[iter,3] = 13.0
654 Begin iteration:
655
656 iter = 24
657 cord_individual_obj[indivial_i,:] = [ 0. 6. 8. 14.]
658 cord_individual_obj[indivial_i,:] = [ 1. 5. 70. 75.]
659 cord_individual_obj[indivial_i,:] = [ 2. 5. 22. 27.]
660 cord_individual_obj[indivial_i,:] = [ 3. 5. 78. 83.]
661 cord_individual_obj[indivial_i,:] = [ 4. 5. 26. 31.]
662 cord_individual_obj[indivial_i,:] = [ 5. 5. 22. 27.]
663 cord_individual_obj[indivial_i,:] = [ 6. 6. 58. 64.]
664 cord_individual_obj[indivial_i,:] = [ 7. 5. 8. 13.]
665 cord_individual_obj[indivial_i,:] = [ 8. 5. 32. 37.]
666 cord_individual_obj[indivial_i,:] = [ 9. 5. 70. 75.]
667 cord_individual_obj[indivial_i,:] = [10. 3. 76. 79.]

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668 cord_individual_obj[indivial_i,:] = [11. 5. 28. 33.]
669 cord_individual_obj[indivial_i,:] = [12. 5. 44. 49.]
670 cord_individual_obj[indivial_i,:] = [13. 5. 8. 13.]
671 cord_individual_obj[indivial_i,:] = [14. 5. 56. 61.]
672 cord_individual_obj[indivial_i,:] = [15. 4. 24. 28.]
673 cord_individual_obj[indivial_i,:] = [16. 5. 8. 13.]
674 cord_individual_obj[indivial_i,:] = [17. 5. 24. 29.]
675 cord_individual_obj[indivial_i,:] = [18. 4. 68. 72.]
676 cord_individual_obj[indivial_i,:] = [19. 5. 24. 29.]
677
678 min(cord_individual_obj[:,3]) = 13.0
679 historl_G_best_iter[iter,3] = 13.0
680 Begin iteration:
681
682 iter = 25
683 cord_individual_obj[indivial_i,:] = [ 0. 4. 58. 62.]
684 cord_individual_obj[indivial_i,:] = [ 1. 5. 58. 63.]
685 cord_individual_obj[indivial_i,:] = [ 2. 5. 58. 63.]
686 cord_individual_obj[indivial_i,:] = [ 3. 5. 8. 13.]
687 cord_individual_obj[indivial_i,:] = [ 4. 5. 68. 73.]
688 cord_individual_obj[indivial_i,:] = [ 5. 5. 58. 63.]
689 cord_individual_obj[indivial_i,:] = [ 6. 5. 64. 69.]
690 cord_individual_obj[indivial_i,:] = [ 7. 5. 82. 87.]
691 cord_individual_obj[indivial_i,:] = [ 8. 5. 68. 73.]
692 cord_individual_obj[indivial_i,:] = [ 9. 5. 58. 63.]
693 cord_individual_obj[indivial_i,:] = [10. 4. 28. 32.]
694 cord_individual_obj[indivial_i,:] = [11. 5. 76. 81.]
695 cord_individual_obj[indivial_i,:] = [12. 5. 68. 73.]
696 cord_individual_obj[indivial_i,:] = [13. 5. 116. 121.]
697 cord_individual_obj[indivial_i,:] = [14. 4. 82. 86.]
698 cord_individual_obj[indivial_i,:] = [15. 5. 70. 75.]
699 cord_individual_obj[indivial_i,:] = [16. 5. 82. 87.]
700 cord_individual_obj[indivial_i,:] = [17. 5. 28. 33.]
701 cord_individual_obj[indivial_i,:] = [18. 5. 32. 37.]
702 cord_individual_obj[indivial_i,:] = [19. 5. 38. 43.]
703
704 min(cord_individual_obj[:,3]) = 13.0
705 historl_G_best_iter[iter,3] = 13.0
706 Begin iteration:
707
708 iter = 26
709 cord_individual_obj[indivial_i,:] = [ 0. 4. 58. 62.]
710 cord_individual_obj[indivial_i,:] = [ 1. 5. 82. 87.]
711 cord_individual_obj[indivial_i,:] = [ 2. 5. 68. 73.]
712 cord_individual_obj[indivial_i,:] = [ 3. 5. 86. 91.]
713 cord_individual_obj[indivial_i,:] = [ 4. 5. 78. 83.]
714 cord_individual_obj[indivial_i,:] = [ 5. 5. 104. 109.]
715 cord_individual_obj[indivial_i,:] = [ 6. 5. 104. 109.]
716 cord_individual_obj[indivial_i,:] = [ 7. 5. 116. 121.]
717 cord_individual_obj[indivial_i,:] = [ 8. 5. 68. 73.]
718 cord_individual_obj[indivial_i,:] = [ 9. 5. 58. 63.]
719 cord_individual_obj[indivial_i,:] = [10. 3. 106. 109.]
720 cord_individual_obj[indivial_i,:] = [11. 5. 76. 81.]
721 cord_individual_obj[indivial_i,:] = [12. 5. 104. 109.]
722 cord_individual_obj[indivial_i,:] = [13. 5. 8. 13.]
723 cord_individual_obj[indivial_i,:] = [14. 4. 58. 62.]
724 cord_individual_obj[indivial_i,:] = [15. 4. 68. 72.]
725 cord_individual_obj[indivial_i,:] = [16. 5. 82. 87.]
726 cord_individual_obj[indivial_i,:] = [17. 5. 58. 63.]
727 cord_individual_obj[indivial_i,:] = [18. 3. 92. 95.]
728 cord_individual_obj[indivial_i,:] = [19. 5. 46. 51.]
729
730 min(cord_individual_obj[:,3]) = 13.0
731 historl_G_best_iter[iter,3] = 13.0
732 Begin iteration:
733
734 iter = 27
735 cord_individual_obj[indivial_i,:] = [ 0. 3. 100. 103.]
736 cord_individual_obj[indivial_i,:] = [ 1. 5. 82. 87.]
737 cord_individual_obj[indivial_i,:] = [ 2. 5. 68. 73.]
738 cord_individual_obj[indivial_i,:] = [ 3. 5. 86. 91.]
739 cord_individual_obj[indivial_i,:] = [ 4. 5. 68. 73.]
740 cord_individual_obj[indivial_i,:] = [ 5. 5. 68. 73.]
741 cord_individual_obj[indivial_i,:] = [ 6. 5. 104. 109.]
742 cord_individual_obj[indivial_i,:] = [ 7. 5. 8. 13.]
743 cord_individual_obj[indivial_i,:] = [ 8. 5. 68. 73.]
744 cord_individual_obj[indivial_i,:] = [ 9. 5. 58. 63.]
745 cord_individual_obj[indivial_i,:] = [10. 4. 46. 50.]
746 cord_individual_obj[indivial_i,:] = [11. 5. 76. 81.]
747 cord_individual_obj[indivial_i,:] = [12. 5. 104. 109.]
748 cord_individual_obj[indivial_i,:] = [13. 5. 82. 87.]
749 cord_individual_obj[indivial_i,:] = [14. 4. 58. 62.]
750 cord_individual_obj[indivial_i,:] = [15. 4. 68. 72.]
751 cord_individual_obj[indivial_i,:] = [16. 5. 82. 87.]

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752     cord_individual_obj[indivial_i, :] = [17. 5. 82. 87.]
753     cord_individual_obj[indivial_i, :] = [18. 3. 92. 95.]
754     cord_individual_obj[indivial_i, :] = [19. 5. 76. 81.]
755
756 min(cord_individual_obj[:, 3]) = 13.0
757 historl_G_best_iter[iter, 3] = 13.0
758 Begin iteration:
759
760 iter = 28
761     cord_individual_obj[indivial_i, :] = [ 0. 4. 50. 54.]
762     cord_individual_obj[indivial_i, :] = [ 1. 5. 8. 13.]
763     cord_individual_obj[indivial_i, :] = [ 2. 5. 24. 29.]
764     cord_individual_obj[indivial_i, :] = [ 3. 5. 82. 87.]
765     cord_individual_obj[indivial_i, :] = [ 4. 5. 12. 17.]
766     cord_individual_obj[indivial_i, :] = [ 5. 5. 58. 63.]
767     cord_individual_obj[indivial_i, :] = [ 6. 5. 8. 13.]
768     cord_individual_obj[indivial_i, :] = [ 7. 5. 116. 121.]
769     cord_individual_obj[indivial_i, :] = [ 8. 5. 76. 81.]
770     cord_individual_obj[indivial_i, :] = [ 9. 5. 82. 87.]
771     cord_individual_obj[indivial_i, :] = [10. 5. 20. 25.]
772     cord_individual_obj[indivial_i, :] = [11. 5. 20. 25.]
773     cord_individual_obj[indivial_i, :] = [12. 5. 44. 49.]
774     cord_individual_obj[indivial_i, :] = [13. 5. 20. 25.]
775     cord_individual_obj[indivial_i, :] = [14. 5. 24. 29.]
776     cord_individual_obj[indivial_i, :] = [15. 4. 24. 28.]
777     cord_individual_obj[indivial_i, :] = [16. 5. 24. 29.]
778     cord_individual_obj[indivial_i, :] = [17. 5. 32. 37.]
779     cord_individual_obj[indivial_i, :] = [18. 5. 46. 51.]
780     cord_individual_obj[indivial_i, :] = [19. 5. 24. 29.]
781
782 min(cord_individual_obj[:, 3]) = 13.0
783 historl_G_best_iter[iter, 3] = 13.0
784 Begin iteration:
785
786 iter = 29
787     cord_individual_obj[indivial_i, :] = [ 0. 6. 44. 50.]
788     cord_individual_obj[indivial_i, :] = [ 1. 5. 82. 87.]
789     cord_individual_obj[indivial_i, :] = [ 2. 6. 52. 58.]
790     cord_individual_obj[indivial_i, :] = [ 3. 5. 86. 91.]
791     cord_individual_obj[indivial_i, :] = [ 4. 5. 54. 59.]
792     cord_individual_obj[indivial_i, :] = [ 5. 6. 8. 14.]
793     cord_individual_obj[indivial_i, :] = [ 6. 5. 68. 73.]
794     cord_individual_obj[indivial_i, :] = [ 7. 5. 8. 13.]
795     cord_individual_obj[indivial_i, :] = [ 8. 5. 52. 57.]
796     cord_individual_obj[indivial_i, :] = [ 9. 5. 74. 79.]
797     cord_individual_obj[indivial_i, :] = [10. 6. 52. 58.]
798     cord_individual_obj[indivial_i, :] = [11. 5. 38. 43.]
799     cord_individual_obj[indivial_i, :] = [12. 5. 44. 49.]
800     cord_individual_obj[indivial_i, :] = [13. 5. 86. 91.]
801     cord_individual_obj[indivial_i, :] = [14. 4. 86. 90.]
802     cord_individual_obj[indivial_i, :] = [15. 6. 8. 14.]
803     cord_individual_obj[indivial_i, :] = [16. 5. 72. 77.]
804     cord_individual_obj[indivial_i, :] = [17. 5. 32. 37.]
805     cord_individual_obj[indivial_i, :] = [18. 6. 40. 46.]
806     cord_individual_obj[indivial_i, :] = [19. 6. 8. 14.]
807
808 min(cord_individual_obj[:, 3]) = 13.0
809 historl_G_best_iter[iter, 3] = 13.0
810 Begin iteration:
811
812 iter = 30
813     cord_individual_obj[indivial_i, :] = [ 0. 5. 88. 93.]
814     cord_individual_obj[indivial_i, :] = [ 1. 5. 52. 57.]
815     cord_individual_obj[indivial_i, :] = [ 2. 5. 68. 73.]
816     cord_individual_obj[indivial_i, :] = [ 3. 5. 8. 13.]
817     cord_individual_obj[indivial_i, :] = [ 4. 5. 92. 97.]
818     cord_individual_obj[indivial_i, :] = [ 5. 5. 104. 109.]
819     cord_individual_obj[indivial_i, :] = [ 6. 5. 104. 109.]
820     cord_individual_obj[indivial_i, :] = [ 7. 5. 116. 121.]
821     cord_individual_obj[indivial_i, :] = [ 8. 5. 68. 73.]
822     cord_individual_obj[indivial_i, :] = [ 9. 5. 58. 63.]
823     cord_individual_obj[indivial_i, :] = [10. 5. 46. 51.]
824     cord_individual_obj[indivial_i, :] = [11. 5. 48. 53.]
825     cord_individual_obj[indivial_i, :] = [12. 5. 68. 73.]
826     cord_individual_obj[indivial_i, :] = [13. 5. 82. 87.]
827     cord_individual_obj[indivial_i, :] = [14. 4. 38. 42.]
828     cord_individual_obj[indivial_i, :] = [15. 5. 68. 73.]
829     cord_individual_obj[indivial_i, :] = [16. 5. 82. 87.]
830     cord_individual_obj[indivial_i, :] = [17. 5. 58. 63.]
831     cord_individual_obj[indivial_i, :] = [18. 4. 70. 74.]
832     cord_individual_obj[indivial_i, :] = [19. 5. 76. 81.]
833
834 min(cord_individual_obj[:, 3]) = 13.0
835 historl_G_best_iter[iter, 3] = 13.0

```

```

836 Iteration calculate over
837
838
839
840
841 All item are in Bin and:
842   Bin area = 1080
843   Real_area = 98.0
844   Proportion_of_area = 0.09074074074074075
845   BEST_CHROM =
846     berth: [ 2.5 26. 8. 13.5 17.5 21. ]
847     time: [0. 0. 0. 0. 0. ]
848     num_QC: [3. 2. 5. 4. 2. 2.]
849 Objective function values and some other indicators:
850   Obj0 = 5.00          Obj1 = 8.00          Obj0 + Obj1 = 13.00
851   Total movement of crane: 8.00
852   Total waiting time in berth position: 0.00
853   Total index of q during berthing: 649.00
854 Specific arrangement for each vessel:
855   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
856   .0          gama_i1 + 1: 2.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 80.0      work load_i:
857   80.0        work load gap_i: 0
856   V_id: 1      li: 6.0      xi: 26.0      bow of i: 23.0      tail of i: 29.0      gama_i0: 0.0      gama_i1: 2
857   .0          gama_i1 + 1: 3.0      gama_i1 - gama_i0: 2.0      duration_time_i: 3.0      demand_i: 120.0      work
857   load_i: 120.0      work load gap_i: 0
857   V_id: 2      li: 6.0      xi: 8.0      bow of i: 5.0      tail of i: 11.0      gama_i0: 0.0      gama_i1: 2.0
857   .0          gama_i1 + 1: 3.0      gama_i1 - gama_i0: 2.0      duration_time_i: 3.0      demand_i: 260.0      work load_i:
857   260.0        work load gap_i: 0
858   V_id: 3      li: 5.0      xi: 13.5      bow of i: 11.0      tail of i: 16.0      gama_i0: 0.0      gama_i1: 0
858   .0          gama_i1 + 1: 1.0      gama_i1 - gama_i0: 0.0      duration_time_i: 1.0      demand_i: 80.0      work
858   load_i: 80.0      work load gap_i: 0
859   V_id: 4      li: 3.0      xi: 17.5      bow of i: 16.0      tail of i: 19.0      gama_i0: 0.0      gama_i1: 4
859   .0          gama_i1 + 1: 5.0      gama_i1 - gama_i0: 4.0      duration_time_i: 5.0      demand_i: 200.0      work
859   load_i: 200.0      work load gap_i: 0
860   V_id: 5      li: 4.0      xi: 21.0      bow of i: 19.0      tail of i: 23.0      gama_i0: 0.0      gama_i1: 5
860   .0          gama_i1 + 1: 6.0      gama_i1 - gama_i0: 5.0      duration_time_i: 6.0      demand_i: 220.0      work
860   load_i: 220.0      work load gap_i: 0
861
862 Algorithm finished and the total CPU time: 216 s
863 End
864

```