

```

1 "E:\1 \ \ \ \ \3 \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \2\6 \ \ \ \ \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=53946
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1 \ \ \ \ \3 \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \2\6 \ \ \ \ \2 python code\
   01_My_Python_Code', 'E:/1 \ \ \ \ \3 \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \2\6 \ \ \ \ \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 \ \ \ \ \3 \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \2\6 \ \ \ \ \2 python code\01_My_Python_Code/
   main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1 \ \ \ \ \3 \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \1 \_LW\_ \ \ \ \ \2\6
   \ \ \ \ \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_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 = 16
23     maxlter_num = 10
24     W_inertia = 0.5
25     oder_type_num = 10
26     c1 = 1.0
27     c2 = 1.0
28     r1 = 0.5824474267766218
29     r2 = 0.5824474267766218
30   Begin iteration:
31
32   iter = 0
33     cord_individul_obj[indivial_i, :] = [ 0.  3. 156. 159.]
34     cord_individul_obj[indivial_i, :] = [ 1.  3. 164. 167.]
35     cord_individul_obj[indivial_i, :] = [ 2.  3. 100. 103.]
36     cord_individul_obj[indivial_i, :] = [ 3.  3. 132. 135.]
37     cord_individul_obj[indivial_i, :] = [ 4.  3. 72. 75.]
38     cord_individul_obj[indivial_i, :] = [ 5.  3. 172. 175.]
39     cord_individul_obj[indivial_i, :] = [ 6.  3. 110. 113.]
40     cord_individul_obj[indivial_i, :] = [ 7.  3. 126. 129.]
41     cord_individul_obj[indivial_i, :] = [ 8.  3. 82. 85.]
42     cord_individul_obj[indivial_i, :] = [ 9.  3. 128. 131.]
43
44     min(cord_individul_obj[:, 3]) = 75.0
45     historl_G_best_iter[iter, 3] = 75.0
46   Begin iteration:
47
48   iter = 1
49     cord_individul_obj[indivial_i, :] = [ 0.  4. 56. 60.]
50     cord_individul_obj[indivial_i, :] = [ 1.  4. 70. 74.]
51     cord_individul_obj[indivial_i, :] = [ 2.  4. 60. 64.]
52     cord_individul_obj[indivial_i, :] = [ 3.  4. 106. 110.]
53     cord_individul_obj[indivial_i, :] = [ 4.  4. 78. 82.]
54     cord_individul_obj[indivial_i, :] = [ 5.  3. 72. 75.]
55     cord_individul_obj[indivial_i, :] = [ 6.  4. 84. 88.]
56     cord_individul_obj[indivial_i, :] = [ 7.  4. 38. 42.]
57     cord_individul_obj[indivial_i, :] = [ 8.  4. 66. 70.]
58     cord_individul_obj[indivial_i, :] = [ 9.  4. 140. 144.]
59
60     min(cord_individul_obj[:, 3]) = 42.0
61     historl_G_best_iter[iter, 3] = 42.0
62   Begin iteration:
63
64   iter = 2
65     cord_individul_obj[indivial_i, :] = [ 0.  5. 28. 33.]
66     cord_individul_obj[indivial_i, :] = [ 1.  6. 96. 102.]
67     cord_individul_obj[indivial_i, :] = [ 2.  3. 30. 33.]
68     cord_individul_obj[indivial_i, :] = [ 3.  6. 86. 92.]
69     cord_individul_obj[indivial_i, :] = [ 4.  5. 32. 37.]
70     cord_individul_obj[indivial_i, :] = [ 5.  4. 100. 104.]
71     cord_individul_obj[indivial_i, :] = [ 6.  6. 92. 98.]
72     cord_individul_obj[indivial_i, :] = [ 7.  6. 60. 66.]
73     cord_individul_obj[indivial_i, :] = [ 8.  4. 24. 28.]
74     cord_individul_obj[indivial_i, :] = [ 9.  4. 38. 42.]
75
76     min(cord_individul_obj[:, 3]) = 28.0
77     historl_G_best_iter[iter, 3] = 28.0
78   Begin iteration:
79

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80 iter = 3
81   cord_individul_obj[indivial_i, :] = [ 0.  5. 28. 33.]
82   cord_individul_obj[indivial_i, :] = [ 1.  6. 128. 134.]
83   cord_individul_obj[indivial_i, :] = [ 2.  4. 88. 92.]
84   cord_individul_obj[indivial_i, :] = [ 3.  6. 108. 114.]
85   cord_individul_obj[indivial_i, :] = [ 4.  5. 24. 29.]
86   cord_individul_obj[indivial_i, :] = [ 5.  4. 24. 28.]
87   cord_individul_obj[indivial_i, :] = [ 6.  6. 100. 106.]
88   cord_individul_obj[indivial_i, :] = [ 7.  6. 74. 80.]
89   cord_individul_obj[indivial_i, :] = [ 8.  4. 32. 36.]
90   cord_individul_obj[indivial_i, :] = [ 9.  6. 20. 26.]
91
92   min(cord_individul_obj[:, 3]) = 26.0
93   historl_G_best_iter[iter, 3] = 26.0
94   Begin iteration:
95
96   iter = 4
97     cord_individul_obj[indivial_i, :] = [ 0.  5. 44. 49.]
98     cord_individul_obj[indivial_i, :] = [ 1.  6. 20. 26.]
99     cord_individul_obj[indivial_i, :] = [ 2.  4. 36. 40.]
100    cord_individul_obj[indivial_i, :] = [ 3.  4. 78. 82.]
101    cord_individul_obj[indivial_i, :] = [ 4.  5. 58. 63.]
102    cord_individul_obj[indivial_i, :] = [ 5.  4. 60. 64.]
103    cord_individul_obj[indivial_i, :] = [ 6.  6. 94. 100.]
104    cord_individul_obj[indivial_i, :] = [ 7.  4. 76. 80.]
105    cord_individul_obj[indivial_i, :] = [ 8.  4. 8. 12.]
106    cord_individul_obj[indivial_i, :] = [ 9.  4. 38. 42.]
107
108    min(cord_individul_obj[:, 3]) = 12.0
109    historl_G_best_iter[iter, 3] = 12.0
110    Begin iteration:
111
112    iter = 5
113      cord_individul_obj[indivial_i, :] = [ 0.  5. 28. 33.]
114      cord_individul_obj[indivial_i, :] = [ 1.  6. 66. 72.]
115      cord_individul_obj[indivial_i, :] = [ 2.  4. 30. 34.]
116      cord_individul_obj[indivial_i, :] = [ 3.  4. 78. 82.]
117      cord_individul_obj[indivial_i, :] = [ 4.  5. 40. 45.]
118      cord_individul_obj[indivial_i, :] = [ 5.  6. 32. 38.]
119      cord_individul_obj[indivial_i, :] = [ 6.  4. 8. 12.]
120      cord_individul_obj[indivial_i, :] = [ 7.  4. 76. 80.]
121      cord_individul_obj[indivial_i, :] = [ 8.  4. 38. 42.]
122      cord_individul_obj[indivial_i, :] = [ 9.  4. 32. 36.]
123
124      min(cord_individul_obj[:, 3]) = 12.0
125      historl_G_best_iter[iter, 3] = 12.0
126      Begin iteration:
127
128      iter = 6
129        cord_individul_obj[indivial_i, :] = [ 0.  4. 30. 34.]
130        cord_individul_obj[indivial_i, :] = [ 1.  6. 12. 18.]
131        cord_individul_obj[indivial_i, :] = [ 2.  4. 30. 34.]
132        cord_individul_obj[indivial_i, :] = [ 3.  4. 8. 12.]
133        cord_individul_obj[indivial_i, :] = [ 4.  4. 36. 40.]
134        cord_individul_obj[indivial_i, :] = [ 5.  6. 24. 30.]
135        cord_individul_obj[indivial_i, :] = [ 6.  6. 20. 26.]
136        cord_individul_obj[indivial_i, :] = [ 7.  6. 20. 26.]
137        cord_individul_obj[indivial_i, :] = [ 8.  4. 38. 42.]
138        cord_individul_obj[indivial_i, :] = [ 9.  6. 24. 30.]
139
140        min(cord_individul_obj[:, 3]) = 12.0
141        historl_G_best_iter[iter, 3] = 12.0
142        Begin iteration:
143
144        iter = 7
145          cord_individul_obj[indivial_i, :] = [ 0.  5. 32. 37.]
146          cord_individul_obj[indivial_i, :] = [ 1.  4. 42. 46.]
147          cord_individul_obj[indivial_i, :] = [ 2.  4. 38. 42.]
148          cord_individul_obj[indivial_i, :] = [ 3.  6. 48. 54.]
149          cord_individul_obj[indivial_i, :] = [ 4.  5. 30. 35.]
150          cord_individul_obj[indivial_i, :] = [ 5.  4. 24. 28.]
151          cord_individul_obj[indivial_i, :] = [ 6.  4. 168. 172.]
152          cord_individul_obj[indivial_i, :] = [ 7.  6. 162. 168.]
153          cord_individul_obj[indivial_i, :] = [ 8.  4. 8. 12.]
154          cord_individul_obj[indivial_i, :] = [ 9.  4. 24. 28.]
155
156          min(cord_individul_obj[:, 3]) = 12.0
157          historl_G_best_iter[iter, 3] = 12.0
158          Begin iteration:
159
160          iter = 8
161            cord_individul_obj[indivial_i, :] = [ 0.  5. 32. 37.]
162            cord_individul_obj[indivial_i, :] = [ 1.  6. 88. 94.]
163            cord_individul_obj[indivial_i, :] = [ 2.  4. 30. 34.]

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164     cord_individul_obj[indivial_i,:] = [ 3. 4. 28. 32.]
165     cord_individul_obj[indivial_i,:] = [ 4. 5. 30. 35.]
166     cord_individul_obj[indivial_i,:] = [ 5. 3. 56. 59.]
167     cord_individul_obj[indivial_i,:] = [ 6. 4. 8. 12.]
168     cord_individul_obj[indivial_i,:] = [ 7. 6. 56. 62.]
169     cord_individul_obj[indivial_i,:] = [ 8. 4. 38. 42.]
170     cord_individul_obj[indivial_i,:] = [ 9. 6. 24. 30.]
171
172     min(cord_individul_obj[:, 3]) = 12.0
173     historl_G_best_iter[iter, 3] = 12.0
174     Begin iteration:
175
176     iter = 9
177     cord_individul_obj[indivial_i,:] = [ 0. 4. 20. 24.]
178     cord_individul_obj[indivial_i,:] = [ 1. 4. 8. 12.]
179     cord_individul_obj[indivial_i,:] = [ 2. 4. 30. 34.]
180     cord_individul_obj[indivial_i,:] = [ 3. 6. 48. 54.]
181     cord_individul_obj[indivial_i,:] = [ 4. 4. 36. 40.]
182     cord_individul_obj[indivial_i,:] = [ 5. 6. 38. 44.]
183     cord_individul_obj[indivial_i,:] = [ 6. 6. 20. 26.]
184     cord_individul_obj[indivial_i,:] = [ 7. 6. 20. 26.]
185     cord_individul_obj[indivial_i,:] = [ 8. 4. 38. 42.]
186     cord_individul_obj[indivial_i,:] = [ 9. 6. 24. 30.]
187
188     min(cord_individul_obj[:, 3]) = 12.0
189     historl_G_best_iter[iter, 3] = 12.0
190     Begin iteration:
191
192     iter = 10
193     cord_individul_obj[indivial_i,:] = [ 0. 4. 20. 24.]
194     cord_individul_obj[indivial_i,:] = [ 1. 6. 12. 18.]
195     cord_individul_obj[indivial_i,:] = [ 2. 4. 54. 58.]
196     cord_individul_obj[indivial_i,:] = [ 3. 4. 8. 12.]
197     cord_individul_obj[indivial_i,:] = [ 4. 4. 36. 40.]
198     cord_individul_obj[indivial_i,:] = [ 5. 6. 24. 30.]
199     cord_individul_obj[indivial_i,:] = [ 6. 6. 20. 26.]
200     cord_individul_obj[indivial_i,:] = [ 7. 6. 20. 26.]
201     cord_individul_obj[indivial_i,:] = [ 8. 4. 38. 42.]
202     cord_individul_obj[indivial_i,:] = [ 9. 6. 24. 30.]
203
204     min(cord_individul_obj[:, 3]) = 12.0
205     historl_G_best_iter[iter, 3] = 12.0
206     Iteration calculate over
207
208
209
210
211     All item are in Bin and:
212     Bin area = 1080
213     Real_area = 107.0
214     Proportion_of_area = 0.09907407407407408
215     BEST_CHROM =
216     berth: [ 8.5 26. 3. 20.5 12.5 16. ]
217     time: [0. 0. 0. 0. 0. 0.]
218     num_QC: [2. 2. 3. 3. 2. 4.]
219     Objective function values and some other indicators:
220     Obj0 = 4.00      Obj1 = 8.00      Obj0 + Obj1 = 12.00
221     Total movement of crane: 8.00
222     Total waiting time in berth position: 0.00
223     Total index of q during berthing: 526.00
224     Specific arrangement for each vessel:
225     V_id: 0      li: 5.0      xi: 8.5      bow of i: 6.0      tail of i: 11.0      gama_i0: 0.0      gama_i1: 1.0
226     gama_i1 + 1: 2.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 80.0      work load_i:
227     80.0      work load gap_i: 0
228     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
229     gama_i1 + 1: 3.0      gama_i1 - gama_i0: 2.0      duration_time_i: 3.0      demand_i: 120.0      work
230     load_i: 120.0      work load gap_i: 0
231     V_id: 2      li: 6.0      xi: 3.0      bow of i: 0.0      tail of i: 6.0      gama_i0: 0.0      gama_i1: 4.0
232     gama_i1 + 1: 5.0      gama_i1 - gama_i0: 4.0      duration_time_i: 5.0      demand_i: 260.0      work load_i:
233     260.0      work load gap_i: 0
234     V_id: 3      li: 5.0      xi: 20.5      bow of i: 18.0      tail of i: 23.0      gama_i0: 0.0      gama_i1: 1
235     gama_i1 + 1: 2.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 80.0      work
236     load_i: 80.0      work load gap_i: 0
237     V_id: 4      li: 3.0      xi: 12.5      bow of i: 11.0      tail of i: 14.0      gama_i0: 0.0      gama_i1: 4
238     gama_i1 + 1: 5.0      gama_i1 - gama_i0: 4.0      duration_time_i: 5.0      demand_i: 200.0      work
239     load_i: 200.0      work load gap_i: 0
240     V_id: 5      li: 4.0      xi: 16.0      bow of i: 14.0      tail of i: 18.0      gama_i0: 0.0      gama_i1: 2
241     gama_i1 + 1: 3.0      gama_i1 - gama_i0: 2.0      duration_time_i: 3.0      demand_i: 220.0      work
242     load_i: 220.0      work load gap_i: 0
243
244     Algorithm finished and the total CPU time: 39 s
245     End
246

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