

```

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=27461
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1 \ \ \ \ \3 \ \ \ \ \ \ \1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \1 \_LW_ \ \ \ \ \2\6 \ \ \ \ \2 python code\
   01_My_Python_Code', 'E:/1 \ \ \ \ \3 \ \ \ \ \ \ \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 \_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 \_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 = 14
23     maxlter_num = 10
24     W_inertia = 1.5
25     oder_type_num = 10
26     c1 = 1.5
27     c2 = 1.0
28     r1 = 0.6642410609132146
29     r2 = 0.6642410609132146
30   Begin iteration:
31
32   iter = 0
33     cord_individul_obj[indivial_i, :] = [ 0.  5. 34. 39.]
34     cord_individul_obj[indivial_i, :] = [ 1.  4. 48. 52.]
35     cord_individul_obj[indivial_i, :] = [ 2.  6.  8. 14.]
36     cord_individul_obj[indivial_i, :] = [ 3.  6. 46. 52.]
37     cord_individul_obj[indivial_i, :] = [ 4.  5. 98. 103.]
38     cord_individul_obj[indivial_i, :] = [ 5.  6. 54. 60.]
39     cord_individul_obj[indivial_i, :] = [ 6.  4. 60. 64.]
40     cord_individul_obj[indivial_i, :] = [ 7.  4. 32. 36.]
41     cord_individul_obj[indivial_i, :] = [ 8.  5. 38. 43.]
42     cord_individul_obj[indivial_i, :] = [ 9.  4. 52. 56.]
43
44     min(cord_individul_obj[:, 3]) = 14.0
45     historl_G_best_iter[iter, 3] = 14.0
46   Begin iteration:
47
48   iter = 1
49     cord_individul_obj[indivial_i, :] = [ 0.  5. 22. 27.]
50     cord_individul_obj[indivial_i, :] = [ 1.  6. 52. 58.]
51     cord_individul_obj[indivial_i, :] = [ 2.  6.  8. 14.]
52     cord_individul_obj[indivial_i, :] = [ 3.  5. 22. 27.]
53     cord_individul_obj[indivial_i, :] = [ 4.  6.  8. 14.]
54     cord_individul_obj[indivial_i, :] = [ 5.  4. 18. 22.]
55     cord_individul_obj[indivial_i, :] = [ 6.  4. 48. 52.]
56     cord_individul_obj[indivial_i, :] = [ 7.  5. 140. 145.]
57     cord_individul_obj[indivial_i, :] = [ 8.  6.  8. 14.]
58     cord_individul_obj[indivial_i, :] = [ 9.  5. 36. 41.]
59
60     min(cord_individul_obj[:, 3]) = 14.0
61     historl_G_best_iter[iter, 3] = 14.0
62   Begin iteration:
63
64   iter = 2
65     cord_individul_obj[indivial_i, :] = [ 0.  5. 26. 31.]
66     cord_individul_obj[indivial_i, :] = [ 1.  5. 60. 65.]
67     cord_individul_obj[indivial_i, :] = [ 2.  4.  8. 12.]
68     cord_individul_obj[indivial_i, :] = [ 3.  5. 22. 27.]
69     cord_individul_obj[indivial_i, :] = [ 4.  6. 24. 30.]
70     cord_individul_obj[indivial_i, :] = [ 5.  5. 12. 17.]
71     cord_individul_obj[indivial_i, :] = [ 6.  6. 18. 24.]
72     cord_individul_obj[indivial_i, :] = [ 7.  6.  8. 14.]
73     cord_individul_obj[indivial_i, :] = [ 8.  6. 68. 74.]
74     cord_individul_obj[indivial_i, :] = [ 9.  5. 44. 49.]
75
76     min(cord_individul_obj[:, 3]) = 12.0
77     historl_G_best_iter[iter, 3] = 12.0
78   Begin iteration:
79

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80 iter = 3
81   cord_individul_obj[indivial_i, :] = [ 0.  6. 26. 32.]
82   cord_individul_obj[indivial_i, :] = [ 1.  4. 18. 22.]
83   cord_individul_obj[indivial_i, :] = [ 2.  6.  8. 14.]
84   cord_individul_obj[indivial_i, :] = [ 3.  5. 46. 51.]
85   cord_individul_obj[indivial_i, :] = [ 4.  6. 16. 22.]
86   cord_individul_obj[indivial_i, :] = [ 5.  4. 26. 30.]
87   cord_individul_obj[indivial_i, :] = [ 6.  6. 74. 80.]
88   cord_individul_obj[indivial_i, :] = [ 7.  5. 36. 41.]
89   cord_individul_obj[indivial_i, :] = [ 8.  4.  8. 12.]
90   cord_individul_obj[indivial_i, :] = [ 9.  4. 20. 24.]
91
92   min(cord_individul_obj[:, 3]) = 12.0
93   historl_G_best_iter[iter, 3] = 12.0
94   Begin iteration:
95
96   iter = 4
97     cord_individul_obj[indivial_i, :] = [ 0.  6.  8. 14.]
98     cord_individul_obj[indivial_i, :] = [ 1.  6. 24. 30.]
99     cord_individul_obj[indivial_i, :] = [ 2.  6.  8. 14.]
100    cord_individul_obj[indivial_i, :] = [ 3.  5. 124. 129.]
101    cord_individul_obj[indivial_i, :] = [ 4.  5. 26. 31.]
102    cord_individul_obj[indivial_i, :] = [ 5.  5. 32. 37.]
103    cord_individul_obj[indivial_i, :] = [ 6.  4.  8. 12.]
104    cord_individul_obj[indivial_i, :] = [ 7.  4. 52. 56.]
105    cord_individul_obj[indivial_i, :] = [ 8.  5. 64. 69.]
106    cord_individul_obj[indivial_i, :] = [ 9.  5. 38. 43.]
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.  6.  8. 14.]
114      cord_individul_obj[indivial_i, :] = [ 1.  4. 44. 48.]
115      cord_individul_obj[indivial_i, :] = [ 2.  6.  8. 14.]
116      cord_individul_obj[indivial_i, :] = [ 3.  4.  8. 12.]
117      cord_individul_obj[indivial_i, :] = [ 4.  4. 52. 56.]
118      cord_individul_obj[indivial_i, :] = [ 5.  3. 32. 35.]
119      cord_individul_obj[indivial_i, :] = [ 6.  6. 44. 50.]
120      cord_individul_obj[indivial_i, :] = [ 7.  3.  8. 11.]
121      cord_individul_obj[indivial_i, :] = [ 8.  4. 18. 22.]
122      cord_individul_obj[indivial_i, :] = [ 9.  4. 38. 42.]
123
124      min(cord_individul_obj[:, 3]) = 11.0
125      historl_G_best_iter[iter, 3] = 11.0
126      Begin iteration:
127
128      iter = 6
129        cord_individul_obj[indivial_i, :] = [ 0.  6.  8. 14.]
130        cord_individul_obj[indivial_i, :] = [ 1.  5. 36. 41.]
131        cord_individul_obj[indivial_i, :] = [ 2.  6. 24. 30.]
132        cord_individul_obj[indivial_i, :] = [ 3.  5. 72. 77.]
133        cord_individul_obj[indivial_i, :] = [ 4.  3.  8. 11.]
134        cord_individul_obj[indivial_i, :] = [ 5.  5. 54. 59.]
135        cord_individul_obj[indivial_i, :] = [ 6.  6. 84. 90.]
136        cord_individul_obj[indivial_i, :] = [ 7.  5. 78. 83.]
137        cord_individul_obj[indivial_i, :] = [ 8.  5. 34. 39.]
138        cord_individul_obj[indivial_i, :] = [ 9.  5. 30. 35.]
139
140        min(cord_individul_obj[:, 3]) = 11.0
141        historl_G_best_iter[iter, 3] = 11.0
142        Begin iteration:
143
144        iter = 7
145          cord_individul_obj[indivial_i, :] = [ 0.  6. 12. 18.]
146          cord_individul_obj[indivial_i, :] = [ 1.  6. 24. 30.]
147          cord_individul_obj[indivial_i, :] = [ 2.  5. 12. 17.]
148          cord_individul_obj[indivial_i, :] = [ 3.  5. 78. 83.]
149          cord_individul_obj[indivial_i, :] = [ 4.  3. 20. 23.]
150          cord_individul_obj[indivial_i, :] = [ 5.  5. 74. 79.]
151          cord_individul_obj[indivial_i, :] = [ 6.  3.  8. 11.]
152          cord_individul_obj[indivial_i, :] = [ 7.  4. 86. 90.]
153          cord_individul_obj[indivial_i, :] = [ 8.  5. 30. 35.]
154          cord_individul_obj[indivial_i, :] = [ 9.  5. 16. 21.]
155
156          min(cord_individul_obj[:, 3]) = 11.0
157          historl_G_best_iter[iter, 3] = 11.0
158          Begin iteration:
159
160          iter = 8
161            cord_individul_obj[indivial_i, :] = [ 0.  6. 38. 44.]
162            cord_individul_obj[indivial_i, :] = [ 1.  6. 12. 18.]
163            cord_individul_obj[indivial_i, :] = [ 2.  5. 12. 17.]

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164 cord_individul_obj[indivial_i,:] = [ 3. 5. 64. 69.]
165 cord_individul_obj[indivial_i,:] = [ 4. 5. 26. 31.]
166 cord_individul_obj[indivial_i,:] = [ 5. 5. 18. 23.]
167 cord_individul_obj[indivial_i,:] = [ 6. 4. 30. 34.]
168 cord_individul_obj[indivial_i,:] = [ 7. 3. 8. 11.]
169 cord_individul_obj[indivial_i,:] = [ 8. 5. 24. 29.]
170 cord_individul_obj[indivial_i,:] = [ 9. 5. 70. 75.]
171
172 min(cord_individul_obj[:,3]) = 11.0
173 historl_G_best_iter[iter,3] = 11.0
174 Begin iteration:
175
176 iter = 9
177 cord_individul_obj[indivial_i,:] = [ 0. 6. 24. 30.]
178 cord_individul_obj[indivial_i,:] = [ 1. 6. 8. 14.]
179 cord_individul_obj[indivial_i,:] = [ 2. 5. 12. 17.]
180 cord_individul_obj[indivial_i,:] = [ 3. 5. 64. 69.]
181 cord_individul_obj[indivial_i,:] = [ 4. 5. 36. 41.]
182 cord_individul_obj[indivial_i,:] = [ 5. 5. 82. 87.]
183 cord_individul_obj[indivial_i,:] = [ 6. 4. 54. 58.]
184 cord_individul_obj[indivial_i,:] = [ 7. 5. 134. 139.]
185 cord_individul_obj[indivial_i,:] = [ 8. 5. 24. 29.]
186 cord_individul_obj[indivial_i,:] = [ 9. 3. 8. 11.]
187
188 min(cord_individul_obj[:,3]) = 11.0
189 historl_G_best_iter[iter,3] = 11.0
190 Begin iteration:
191
192 iter = 10
193 cord_individul_obj[indivial_i,:] = [ 0. 6. 8. 14.]
194 cord_individul_obj[indivial_i,:] = [ 1. 6. 12. 18.]
195 cord_individul_obj[indivial_i,:] = [ 2. 5. 12. 17.]
196 cord_individul_obj[indivial_i,:] = [ 3. 5. 64. 69.]
197 cord_individul_obj[indivial_i,:] = [ 4. 5. 72. 77.]
198 cord_individul_obj[indivial_i,:] = [ 5. 5. 70. 75.]
199 cord_individul_obj[indivial_i,:] = [ 6. 4. 48. 52.]
200 cord_individul_obj[indivial_i,:] = [ 7. 3. 8. 11.]
201 cord_individul_obj[indivial_i,:] = [ 8. 5. 24. 29.]
202 cord_individul_obj[indivial_i,:] = [ 9. 3. 78. 81.]
203
204 min(cord_individul_obj[:,3]) = 11.0
205 historl_G_best_iter[iter,3] = 11.0
206 Iteration calculate over
207
208
209
210
211 All item are in Bin and:
212 Bin area = 1080
213 Real_area = 78.0
214 Proportion_of_area = 0.07222222222222222
215 BEST_CHROM =
216 berth: [ 7.5 26. 20. 2.5 11.5 15. ]
217 time: [0. 0. 0. 0. 0. 0.]
218 num_QC: [2. 2. 4. 2. 3. 4.]
219 Objective function values and some other indicators:
220 Obj0 = 3.00 Obj1 = 8.00 Obj0 + Obj1 = 11.00
221 Total movement of crane: 8.00
222 Total waiting time in berth position: 0.00
223 Total index of q during berthing: 659.00
224 Specific arrangement for each vessel:
225 V_id: 0 li: 5.0 xi: 7.5 bow of i: 5.0 tail of i: 10.0 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: 80.0 work load_i:
80.0 work load gap_i: 0
226 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
gama_i1 + 1: 3.0 gama_i1 - gama_i0: 2.0 duration_time_i: 3.0 demand_i: 120.0 work
load_i: 120.0 work load gap_i: 0
227 V_id: 2 li: 6.0 xi: 20.0 bow of i: 17.0 tail of i: 23.0 gama_i0: 0.0 gama_i1: 3
gama_i1 + 1: 4.0 gama_i1 - gama_i0: 3.0 duration_time_i: 4.0 demand_i: 260.0 work
load_i: 260.0 work load gap_i: 0
228 V_id: 3 li: 5.0 xi: 2.5 bow of i: 0.0 tail of i: 5.0 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: 80.0 work load_i:
80.0 work load gap_i: 0
229 V_id: 4 li: 3.0 xi: 11.5 bow of i: 10.0 tail of i: 13.0 gama_i0: 0.0 gama_i1: 3
gama_i1 + 1: 4.0 gama_i1 - gama_i0: 3.0 duration_time_i: 4.0 demand_i: 200.0 work
load_i: 200.0 work load gap_i: 0
230 V_id: 5 li: 4.0 xi: 15.0 bow of i: 13.0 tail of i: 17.0 gama_i0: 0.0 gama_i1: 2
gama_i1 + 1: 3.0 gama_i1 - gama_i0: 2.0 duration_time_i: 3.0 demand_i: 220.0 work
load_i: 220.0 work load gap_i: 0
231
232 Algorithm finished and the total CPU time: 36 s
233 End
234

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