```
1  "E:\1 □□□□\3 □□□□\1 □□□□□□\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=7433
2
3  import sys; print('Python %s on %s' % (sys.version, sys.platform))
4  sys.path.extend(['E:\\1 □□□□\\3 □□□□\\1 □□□□□□\\1 □□□□□□□□\\1_□□□□□□_□□□□\\1_LW_□□□□2\\6 □□□□\\2 python code\\
   01_My_Python_Code', 'E:/1 □□□□/3 □□□□/1 □□□□□□/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_□□□□□□_□□□□/1_LW_□□□□2/6 □□□□/2 python code/01_My_Python_Code/
   main_BACASP_official_ENSGA-II.py', wdir='E:/1 □□□□/3 □□□□/1 □□□□□□/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_2_1 _standerd_test.xlsx  optimization process solved by ENSGA-II algorithm.
14
15 Start
16
17 Before iteration:
18    Read basic data
19    Parameter setting:
20       trail =  26
21       Pop_size =  20
22       Tolerance_iteration_unchanged_number =  6
23       Chrom_size =  6
24       Iter_num_GA =  300
25       Select_rate =  0.8
26       Crossover_rate =  0.85
27       Mutation rate =  0.9
28       Mu_oper_type =  1
29       vessel_move_way =  2
30       coefficient for Obj1=  1.9
31       coefficient for Obj2=  0.10000000000000009
32       gen =  0
33
34 Iteration begin:
35 Beging the No. 0  iteration:
36    obj[0] = 5.70    temp_best_value_gen = 5.70
37    The No. 0  iteration is finished!
38
39 Beging the No. 1  iteration:
40    obj[gen-1] = 5.70    temp_best_value_gen = 5.70
41    No, maintain solution  and obj[gen] = 5.70 , and the tolerance_counter = 1
42    solution chromosome =
43       first level: [ [2. 8.]
44       second level:  [0. 0.]
45       third level:  [2. 6.] ]
46    The No. 1  iteration is finished!
47
48 Beging the No. 2  iteration:
49    obj[gen-1] = 5.70    temp_best_value_gen = 5.70
50    No, maintain solution  and obj[gen] = 5.70 , and the tolerance_counter = 2
51    solution chromosome =
52       first level: [ [2. 8.]
53       second level:  [0. 0.]
54       third level:  [2. 6.] ]
55    The No. 2  iteration is finished!
56
57 Beging the No. 3  iteration:
58    obj[gen-1] = 5.70    temp_best_value_gen = 5.70
59    No, maintain solution  and obj[gen] = 5.70 , and the tolerance_counter = 3
60    solution chromosome =
61       first level: [ [2. 8.]
62       second level:  [0. 0.]
63       third level:  [2. 6.] ]
64    The No. 3  iteration is finished!
65
66 Beging the No. 4  iteration:
67    obj[gen-1] = 5.70    temp_best_value_gen = 5.70
68    No, maintain solution  and obj[gen] = 5.70 , and the tolerance_counter = 4
69    solution chromosome =
70       first level: [ [2. 8.]
71       second level:  [0. 0.]
72       third level:  [2. 6.] ]
73    The No. 4  iteration is finished!
74
75 Beging the No. 5  iteration:
76    obj[gen-1] = 5.70    temp_best_value_gen = 5.70
77    No, maintain solution  and obj[gen] = 5.70 , and the tolerance_counter = 5
78    solution chromosome =
79       first level: [ [2. 8.]
```

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80      second level:  [0. 0.]
81      third level:  [2. 6.] ]
82    The No. 5  iteration is finished!
83
84  Beging the No. 6  iteration:
85    obj[gen-1] = 5.70    temp_best_value_gen = 5.70
86    No, maintain solution  and obj[gen] = 5.70 , and the tolerance_counter = 6
87    solution chromosome =
88      first level: [ [2. 8.]
89      second level:  [0. 0.]
90      third level:  [2. 6.] ]
91    The No. 6  iteration is finished!
92
93
94  ------------------------------------------------------------------------------
95  The iteration is terminated and then visulize the solution:
96    solution chromosome =
97      first level: [ [2. 8.]
98      second level:  [0. 0.]
99      third level:  [2. 6.] ]
100   Objective function values and some other indicators:
101     Obj0 = 3.00          Obj1 = 0.00          Obj0 + Obj1 = 3.00
102     Total movement of crane: 0.00
103     Total waiting time in berth position: 0.00
104     Total index of q during berthing: 43.00
105   Specific arrangement for each vessel:
106     V_id:  0          li: 4.0          xi: 2.0          bow of i: 0.0          tail of i: 4.0          gama_i0: 0.0          gama_i1: 4.0
                duration_time_i: 4.0          demand_i: 160.0          work load_i: 160.0          work load gap_i: 0
107     V_id:  1          li: 8.0          xi: 8.0          bow of i: 4.0          tail of i: 12.0          gama_i0: 0.0          gama_i1: 1.0
                duration_time_i: 1.0          demand_i: 120.0          work load_i: 120.0          work load gap_i: 0
108
109  Algorithm finished and the total CPU time: 112 s
110  End
111
```