



```

80     second level: [1. 0.]
81     third level: [3. 7.] ]
82     The No. 5 iteration is finished!
83
84 Beging the No. 6 iteration:
85     obj[gen-1] = 8.43     temp_best_value_gen = 8.43
86     No, maintain solution and obj[gen] = 8.43 , and the tolerance_counter = 5
87     solution chromosome =
88         first level: [ 2.2  4.08]
89         second level: [1. 0.]
90         third level: [3. 7.] ]
91     The No. 6 iteration is finished!
92
93 Beging the No. 7 iteration:
94     obj[gen-1] = 8.43     temp_best_value_gen = 8.43
95     No, maintain solution and obj[gen] = 8.43 , and the tolerance_counter = 6
96     solution chromosome =
97         first level: [ 2.2  4.08]
98         second level: [1. 0.]
99         third level: [3. 7.] ]
100    The No. 7 iteration is finished!
101
102 Beging the No. 8 iteration:
103     obj[gen-1] = 8.43     temp_best_value_gen = 8.43
104     No, maintain solution and obj[gen] = 8.43 , and the tolerance_counter = 7
105     solution chromosome =
106         first level: [ 2.2  4.08]
107         second level: [1. 0.]
108         third level: [3. 7.] ]
109    The No. 8 iteration is finished!
110
111 Beging the No. 9 iteration:
112     obj[gen-1] = 8.43     temp_best_value_gen = 8.43
113     No, maintain solution and obj[gen] = 8.43 , and the tolerance_counter = 8
114     solution chromosome =
115         first level: [ 2.2  4.08]
116         second level: [1. 0.]
117         third level: [3. 7.] ]
118    The No. 9 iteration is finished!
119
120
121 -----
122 The iteration is terminated and then visulize the solution:
123     solution chromosome =
124         first level: [ 2.2  4.08]
125         second level: [1. 0.]
126         third level: [3. 7.] ]
127 Objective function values and some other indicators:
128     Obj0 = 3.00           Obj1 = 5.43           Obj0 + Obj1 = 8.43
129     Total movement of crane: 4.43
130     Total waiting time in berth position: 1.00
131     Total index of q during berthing: 22.00
132 Specific arrangement for each vessel:
133     V_id: 0             li: 4.0             xi: 2.2             bow of i: 0.2             tail of i: 4.2             gama_i0: 1.0             gama_i1: 4.0
134         duration_time_i: 3.0             demand_i: 160.0             work load_i: 160.0             work load gap_i: 0
135     V_id: 1             li: 8.0             xi: 4.1             bow of i: 0.1             tail of i: 8.1             gama_i0: 0.0             gama_i1: 1.0
136         duration_time_i: 1.0             demand_i: 120.0             work load_i: 120.0             work load gap_i: 0
137
138 Algorithm finished and the total CPU time: 286 s
139 End
140

```