


```

80     second level: [0. 2. 4. 1.]
81     third level: [8. 3. 3. 5.] ]
82     The No. 5 iteration is finished!
83
84     Beging the No. 6 iteration:
85     obj[gen-1] = 10.93   temp_best_value_gen = 10.93
86     No, maintain solution and obj[gen] = 10.93 , and the tolerance_counter = 6
87     solution chromosome =
88     first level: [ [7.62 1.66 3.53 6.3 ]
89     second level: [0. 2. 4. 1.]
90     third level: [8. 3. 3. 5.] ]
91     The No. 6 iteration is finished!
92
93     Beging the No. 7 iteration:
94     obj[gen-1] = 10.93   temp_best_value_gen = 10.93
95     No, maintain solution and obj[gen] = 10.93 , and the tolerance_counter = 7
96     solution chromosome =
97     first level: [ [7.62 1.66 3.53 6.3 ]
98     second level: [0. 2. 4. 1.]
99     third level: [8. 3. 3. 5.] ]
100    The No. 7 iteration is finished!
101
102    Beging the No. 8 iteration:
103    obj[gen-1] = 10.93   temp_best_value_gen = 10.93
104    No, maintain solution and obj[gen] = 10.93 , and the tolerance_counter = 8
105    solution chromosome =
106    first level: [ [7.62 1.66 3.53 6.3 ]
107    second level: [0. 2. 4. 1.]
108    third level: [8. 3. 3. 5.] ]
109    The No. 8 iteration is finished!
110
111    Beging the No. 9 iteration:
112    obj[gen-1] = 10.93   temp_best_value_gen = 10.93
113    No, maintain solution and obj[gen] = 10.93 , and the tolerance_counter = 9
114    solution chromosome =
115    first level: [ [7.62 1.66 3.53 6.3 ]
116    second level: [0. 2. 4. 1.]
117    third level: [8. 3. 3. 5.] ]
118    The No. 9 iteration is finished!
119
120    Beging the No. 10 iteration:
121    obj[gen-1] = 10.93   temp_best_value_gen = 10.93
122    No, maintain solution and obj[gen] = 10.93 , and the tolerance_counter = 10
123    solution chromosome =
124    first level: [ [7.62 1.66 3.53 6.3 ]
125    second level: [0. 2. 4. 1.]
126    third level: [8. 3. 3. 5.] ]
127    The No. 10 iteration is finished!
128
129
130 -----
131 The iteration is terminated and then visulize the solution:
132 solution chromosome =
133 first level: [ [7.62 1.66 3.53 6.3 ]
134 second level: [0. 2. 4. 1.]
135 third level: [8. 3. 3. 5.] ]
136 Objective function values and some other indicators:
137 Obj0 = 5.00      Obj1 = 14.34      Obj0 + Obj1 = 19.34
138 Total movement of crane: 7.34
139 Total waiting time in berth position: 7.00
140 Total index of q during berthing: 60.00
141 Specific arrangement for each vessel:
142 V_id: 0          li: 9.0          xi: 7.6          bow of i: 3.1          tail of i: 12.1          gama_i0: 0.0          gama_i1: 1.0
143           duration_time_i: 1.0          demand_i: 100.0          work load_i: 100.0          work load gap_i: 0
144 V_id: 1          li: 3.0          xi: 1.7          bow of i: 0.2          tail of i: 3.2          gama_i0: 2.0          gama_i1: 4.0
145           duration_time_i: 2.0          demand_i: 120.0          work load_i: 120.0          work load gap_i: 0
146 V_id: 2          li: 5.0          xi: 3.5          bow of i: 1.0          tail of i: 6.0          gama_i0: 4.0          gama_i1: 6.0
147           duration_time_i: 2.0          demand_i: 100.0          work load_i: 100.0          work load gap_i: 0
148 V_id: 3          li: 8.0          xi: 6.3          bow of i: 2.3          tail of i: 10.3          gama_i0: 1.0          gama_i1: 2.0
149           duration_time_i: 1.0          demand_i: 100.0          work load_i: 100.0          work load gap_i: 0
150
151 Algorithm finished and the total CPU time: 504 s
152 End
153

```