


```

80     second level: [1. 0.]
81     third level: [3. 6.] ]
82     The No. 5 iteration is finished!
83
84     Beging the No. 6 iteration:
85     obj[gen-1] = 8.45     temp_best_value_gen = 8.45
86     No, maintain solution and obj[gen] = 8.45 , and the tolerance_counter = 6
87     solution chromosome =
88     first level: [ [2.33 4.04]
89     second level: [1. 0.]
90     third level: [3. 6.] ]
91     The No. 6 iteration is finished!
92
93     Beging the No. 7 iteration:
94     obj[gen-1] = 8.45     temp_best_value_gen = 8.45
95     No, maintain solution and obj[gen] = 8.45 , and the tolerance_counter = 7
96     solution chromosome =
97     first level: [ [2.33 4.04]
98     second level: [1. 0.]
99     third level: [3. 6.] ]
100    The No. 7 iteration is finished!
101
102    Beging the No. 8 iteration:
103    obj[gen-1] = 8.45     temp_best_value_gen = 8.45
104    No, maintain solution and obj[gen] = 8.45 , and the tolerance_counter = 8
105    solution chromosome =
106    first level: [ [2.33 4.04]
107    second level: [1. 0.]
108    third level: [3. 6.] ]
109    The No. 8 iteration is finished!
110
111    Beging the No. 9 iteration:
112    obj[gen-1] = 8.45     temp_best_value_gen = 8.45
113    No, maintain solution and obj[gen] = 8.45 , and the tolerance_counter = 9
114    solution chromosome =
115    first level: [ [2.33 4.04]
116    second level: [1. 0.]
117    third level: [3. 6.] ]
118    The No. 9 iteration is finished!
119
120    Beging the No. 10 iteration:
121    obj[gen-1] = 8.45     temp_best_value_gen = 8.45
122    No, maintain solution and obj[gen] = 8.45 , and the tolerance_counter = 10
123    solution chromosome =
124    first level: [ [2.33 4.04]
125    second level: [1. 0.]
126    third level: [3. 6.] ]
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: [ [2.33 4.04]
134    second level: [1. 0.]
135    third level: [3. 6.] ]
136    Objective function values and some other indicators:
137    Obj0 = 3.00      Obj1 = 4.64      Obj0 + Obj1 = 7.64
138    Total movement of crane: 3.64
139    Total waiting time in berth position: 1.00
140    Total index of q during berthing: 22.00
141    Specific arrangement for each vessel:
142    V_id: 0          li: 4.0          xi: 2.3          bow of i: 0.3          tail of i: 4.3          gama_i0: 1.0          gama_i1: 4.0
143          duration_time_i: 3.0          demand_i: 160.0          work load_i: 160.0          work load gap_i: 0
144    V_id: 1          li: 8.0          xi: 4.0          bow of i: 0.0          tail of i: 8.0          gama_i0: 0.0          gama_i1: 1.0
145          duration_time_i: 1.0          demand_i: 120.0          work load_i: 120.0          work load gap_i: 0
146
147    Algorithm finished and the total CPU time: 166 s
148    End
149

```