



```

80     second level: [1. 1.]
81     third level: [3. 7.] ]
82     The No. 5 iteration is finished!
83
84     Beging the No. 6 iteration:
85     obj[gen-1] = 4.50    temp_best_value_gen = 4.50
86     No, maintain solution and obj[gen] = 4.50 , and the tolerance_counter = 3
87     solution chromosome =
88     first level: [ [2. 8.]
89     second level: [1. 1.]
90     third level: [3. 7.] ]
91     The No. 6 iteration is finished!
92
93     Beging the No. 7 iteration:
94     obj[gen-1] = 4.50    temp_best_value_gen = 4.50
95     No, maintain solution and obj[gen] = 4.50 , and the tolerance_counter = 4
96     solution chromosome =
97     first level: [ [2. 8.]
98     second level: [1. 1.]
99     third level: [3. 7.] ]
100    The No. 7 iteration is finished!
101
102    Beging the No. 8 iteration:
103    obj[gen-1] = 4.50    temp_best_value_gen = 4.50
104    No, maintain solution and obj[gen] = 4.50 , and the tolerance_counter = 5
105    solution chromosome =
106    first level: [ [2. 8.]
107    second level: [1. 1.]
108    third level: [3. 7.] ]
109    The No. 8 iteration is finished!
110
111
112    -----
113    The iteration is terminated and then visulize the solution:
114    solution chromosome =
115    first level: [ [2. 8.]
116    second level: [1. 1.]
117    third level: [3. 7.] ]
118    Objective function values and some other indicators:
119    Obj0 = 3.00      Obj1 = 2.00      Obj0 + Obj1 = 5.00
120    Total movement of crane: 0.00
121    Total waiting time in berth position: 2.00
122    Total index of q during berthing: 46.00
123    Specific arrangement for each vessel:
124    V_id: 0          li: 4.0          xi: 2.0          bow of i: 0.0          tail of i: 4.0          gama_i0: 1.0          gama_i1: 4.0
125    duration_time_i: 3.0          demand_i: 160.0          work load_i: 160.0          work load gap_i: 0
126    V_id: 1          li: 8.0          xi: 8.0          bow of i: 4.0          tail of i: 12.0          gama_i0: 1.0          gama_i1: 2.0
127    duration_time_i: 1.0          demand_i: 120.0          work load_i: 120.0          work load gap_i: 0
128
129    Algorithm finished and the total CPU time: 139 s
130    End
131

```