


```

80     second level: [0. 4.]
81     third level: [2. 6.] ]
82     The No. 5 iteration is finished!
83
84     Beging the No. 6 iteration:
85     obj[gen-1] = 8.00    temp_best_value_gen = 8.00
86     No, maintain solution and obj[gen] = 8.00 , and the tolerance_counter = 6
87     solution chromosome =
88     first level: [ [2. 8.]
89     second level: [0. 4.]
90     third level: [2. 6.] ]
91     The No. 6 iteration is finished!
92
93     Beging the No. 7 iteration:
94     obj[gen-1] = 8.00    temp_best_value_gen = 8.00
95     No, maintain solution and obj[gen] = 8.00 , and the tolerance_counter = 7
96     solution chromosome =
97     first level: [ [2. 8.]
98     second level: [0. 4.]
99     third level: [2. 6.] ]
100    The No. 7 iteration is finished!
101
102    Beging the No. 8 iteration:
103    obj[gen-1] = 8.00    temp_best_value_gen = 8.00
104    No, maintain solution and obj[gen] = 8.00 , and the tolerance_counter = 8
105    solution chromosome =
106    first level: [ [2. 8.]
107    second level: [0. 4.]
108    third level: [2. 6.] ]
109    The No. 8 iteration is finished!
110
111    Beging the No. 9 iteration:
112    obj[gen-1] = 8.00    temp_best_value_gen = 8.00
113    No, maintain solution and obj[gen] = 8.00 , and the tolerance_counter = 9
114    solution chromosome =
115    first level: [ [2. 8.]
116    second level: [0. 4.]
117    third level: [2. 6.] ]
118    The No. 9 iteration is finished!
119
120    Beging the No. 10 iteration:
121    obj[gen-1] = 8.00    temp_best_value_gen = 8.00
122    No, maintain solution and obj[gen] = 8.00 , and the tolerance_counter = 10
123    solution chromosome =
124    first level: [ [2. 8.]
125    second level: [0. 4.]
126    third level: [2. 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. 8.]
134    second level: [0. 4.]
135    third level: [2. 6.] ]
136    Objective function values and some other indicators:
137    Obj0 = 4.00          Obj1 = 4.00          Obj0 + Obj1 = 8.00
138    Total movement of crane: 0.00
139    Total waiting time in berth position: 4.00
140    Total index of q during berthing: 43.00
141    Specific arrangement for each vessel:
142    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
143    duration_time_i: 4.0             demand_i: 160.0             work load_i: 160.0             work load gap_i: 0
144    V_id: 1             li: 8.0             xi: 8.0             bow of i: 4.0             tail of i: 12.0             gama_i0: 4.0             gama_i1: 5.0
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: 82 s
148    End
149

```