


```

80     second level: [0. 0.]
81     third level: [2. 4.] ]
82     The No. 5 iteration is finished!
83
84     Beging the No. 6 iteration:
85     obj[gen-1] = 1.50    temp_best_value_gen = 1.50
86     No, maintain solution and obj[gen] = 1.50 , and the tolerance_counter = 3
87     solution chromosome =
88     first level: [ [2. 8.]
89     second level: [0. 0.]
90     third level: [2. 4.] ]
91     The No. 6 iteration is finished!
92
93     Beging the No. 7 iteration:
94     obj[gen-1] = 1.50    temp_best_value_gen = 1.50
95     No, maintain solution and obj[gen] = 1.50 , and the tolerance_counter = 4
96     solution chromosome =
97     first level: [ [2. 8.]
98     second level: [0. 0.]
99     third level: [2. 4.] ]
100    The No. 7 iteration is finished!
101
102    Beging the No. 8 iteration:
103    obj[gen-1] = 1.50    temp_best_value_gen = 1.50
104    No, maintain solution and obj[gen] = 1.50 , and the tolerance_counter = 5
105    solution chromosome =
106    first level: [ [2. 8.]
107    second level: [0. 0.]
108    third level: [2. 4.] ]
109    The No. 8 iteration is finished!
110
111    Beging the No. 9 iteration:
112    obj[gen-1] = 1.50    temp_best_value_gen = 1.50
113    No, maintain solution and obj[gen] = 1.50 , and the tolerance_counter = 6
114    solution chromosome =
115    first level: [ [2. 8.]
116    second level: [0. 0.]
117    third level: [2. 4.] ]
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. 8.]
125    second level: [0. 0.]
126    third level: [2. 4.] ]
127    Objective function values and some other indicators:
128    Obj0 = 3.00          Obj1 = 0.00          Obj0 + Obj1 = 3.00
129    Total movement of crane: 0.00
130    Total waiting time in berth position: 0.00
131    Total index of q during berthing: 35.00
132    Specific arrangement for each vessel:
133    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
134    duration_time_i: 4.0             demand_i: 160.0             work load_i: 160.0             work load gap_i: 0
135    V_id: 1             li: 8.0             xi: 8.0             bow of i: 4.0             tail of i: 12.0             gama_i0: 0.0             gama_i1: 2.0
136    duration_time_i: 2.0             demand_i: 120.0             work load_i: 120.0             work load gap_i: 0
137
138    Algorithm finished and the total CPU time: 233 s
139    End
140

```