


```

80     second level: [0. 0. 0.]
81     third level: [7. 4. 2.]]
82     The No. 5 iteration is finished!
83
84     Beging the No. 6 iteration:
85     obj[gen-1] = 3.80    temp_best_value_gen = 3.80
86     No, maintain solution and obj[gen] = 3.80 , and the tolerance_counter = 6
87     solution chromosome =
88     first level: [ [ 4. 10. 15.5]
89     second level: [0. 0. 0.]
90     third level: [7. 4. 2.]]
91     The No. 6 iteration is finished!
92
93     Beging the No. 7 iteration:
94     obj[gen-1] = 3.80    temp_best_value_gen = 3.80
95     No, maintain solution and obj[gen] = 3.80 , and the tolerance_counter = 7
96     solution chromosome =
97     first level: [ [ 4. 10. 15.5]
98     second level: [0. 0. 0.]
99     third level: [7. 4. 2.]]
100    The No. 7 iteration is finished!
101
102    Beging the No. 8 iteration:
103    obj[gen-1] = 3.80    temp_best_value_gen = 3.80
104    No, maintain solution and obj[gen] = 3.80 , and the tolerance_counter = 8
105    solution chromosome =
106    first level: [ [ 4. 10. 15.5]
107    second level: [0. 0. 0.]
108    third level: [7. 4. 2.]]
109    The No. 8 iteration is finished!
110
111    Beging the No. 9 iteration:
112    obj[gen-1] = 3.80    temp_best_value_gen = 3.80
113    No, maintain solution and obj[gen] = 3.80 , and the tolerance_counter = 9
114    solution chromosome =
115    first level: [ [ 4. 10. 15.5]
116    second level: [0. 0. 0.]
117    third level: [7. 4. 2.]]
118    The No. 9 iteration is finished!
119
120    Beging the No. 10 iteration:
121    obj[gen-1] = 3.80    temp_best_value_gen = 3.80
122    No, maintain solution and obj[gen] = 3.80 , and the tolerance_counter = 10
123    solution chromosome =
124    first level: [ [ 4. 10. 15.5]
125    second level: [0. 0. 0.]
126    third level: [7. 4. 2.]]
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: [ [ 4. 10. 15.5]
134 second level: [0. 0. 0.]
135 third level: [7. 4. 2.]]
136 Objective function values and some other indicators:
137 Obj0 = 2.00      Obj1 = 0.00      Obj0 + Obj1 = 2.00
138 Total movement of crane: 0.00
139 Total waiting time in berth position: 0.00
140 Total index of q during berthing: 148.00
141 Specific arrangement for each vessel:
142 V_id: 0          li: 8.0          xi: 4.0          bow of i: 0.0          tail of i: 8.0          gama_i0: 0.0          gama_i1: 1.0
143          duration_time_i: 1.0          demand_i: 140.0          work load_i: 140.0          work load gap_i: 0
144 V_id: 1          li: 4.0          xi: 10.0         bow of i: 8.0          tail of i: 12.0         gama_i0: 0.0          gama_i1: 2
145 .0          duration_time_i: 2.0          demand_i: 140.0          work load_i: 140.0          work load gap_i: 0
146 V_id: 2          li: 7.0          xi: 15.5         bow of i: 12.0         tail of i: 19.0         gama_i0: 0.0          gama_i1: 3
147 .0          duration_time_i: 3.0          demand_i: 100.0          work load_i: 100.0          work load gap_i: 0
148
149
150 Algorithm finished and the total CPU time: 585 s
151 End
152

```