


```

80     second level: [ 2. 4. 5. 0. 4. 0. 3. 7. 9. 11. 13. 0.]
81     third level: [2. 3. 3. 3. 2. 2. 5. 3. 2. 3. 4. 8.]
82     The No. 5 iteration is finished!
83
84 Beging the No. 6 iteration:
85     obj[gen-1] = 37.70   temp_best_value_gen = 37.70
86     No, maintain solution and obj[gen] = 37.70 , and the tolerance_counter = 6
87     solution chromosome =
88         first level: [ [ 1.5 4.5 7.5 11. 14.5 19.5 26. 4.5 1.5 1.5 4.5 4.5]
89         second level: [ 2. 4. 5. 0. 4. 0. 3. 7. 9. 11. 13. 0.]
90         third level: [2. 3. 3. 3. 2. 2. 5. 3. 2. 3. 4. 8.]
91     The No. 6 iteration is finished!
92
93 Beging the No. 7 iteration:
94     obj[gen-1] = 37.70   temp_best_value_gen = 37.70
95     No, maintain solution and obj[gen] = 37.70 , and the tolerance_counter = 7
96     solution chromosome =
97         first level: [ [ 1.5 4.5 7.5 11. 14.5 19.5 26. 4.5 1.5 1.5 4.5 4.5]
98         second level: [ 2. 4. 5. 0. 4. 0. 3. 7. 9. 11. 13. 0.]
99         third level: [2. 3. 3. 3. 2. 2. 5. 3. 2. 3. 4. 8.]
100    The No. 7 iteration is finished!
101
102 Beging the No. 8 iteration:
103     obj[gen-1] = 37.70   temp_best_value_gen = 37.70
104     No, maintain solution and obj[gen] = 37.70 , and the tolerance_counter = 8
105     solution chromosome =
106         first level: [ [ 1.5 4.5 7.5 11. 14.5 19.5 26. 4.5 1.5 1.5 4.5 4.5]
107         second level: [ 2. 4. 5. 0. 4. 0. 3. 7. 9. 11. 13. 0.]
108         third level: [2. 3. 3. 3. 2. 2. 5. 3. 2. 3. 4. 8.]
109    The No. 8 iteration is finished!
110
111 Beging the No. 9 iteration:
112     obj[gen-1] = 37.70   temp_best_value_gen = 37.70
113     No, maintain solution and obj[gen] = 37.70 , and the tolerance_counter = 9
114     solution chromosome =
115         first level: [ [ 1.5 4.5 7.5 11. 14.5 19.5 26. 4.5 1.5 1.5 4.5 4.5]
116         second level: [ 2. 4. 5. 0. 4. 0. 3. 7. 9. 11. 13. 0.]
117         third level: [2. 3. 3. 3. 2. 2. 5. 3. 2. 3. 4. 8.]
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: [ [ 1.5 4.5 7.5 11. 14.5 19.5 26. 4.5 1.5 1.5 4.5 4.5]
125         second level: [ 2. 4. 5. 0. 4. 0. 3. 7. 9. 11. 13. 0.]
126         third level: [2. 3. 3. 3. 2. 2. 5. 3. 2. 3. 4. 8.]
127     Objective function values and some other indicators:
128         Obj0 = 14.00      Obj1 = 111.00      Obj0 + Obj1 = 125.00
129         Total movement of crane: 40.00
130         Total waiting time in berth position: 58.00
131         Total index of q during berthing: 494.00
132     Specific arrangement for each vessel:
133         V_id: 0      li: 3.0      xi: 1.5      bow of i: 0.0      tail of i: 3.0      gama_i0: 2.0      gama_i1: 6.0
134         duration_time_i: 4.0      demand_i: 140.0      work load_i: 140.0      work load gap_i: 0
135         V_id: 1      li: 3.0      xi: 4.5      bow of i: 3.0      tail of i: 6.0      gama_i0: 4.0      gama_i1: 7.0
136         duration_time_i: 3.0      demand_i: 140.0      work load_i: 140.0      work load gap_i: 0
137         V_id: 2      li: 3.0      xi: 7.5      bow of i: 6.0      tail of i: 9.0      gama_i0: 5.0      gama_i1: 7.0
138         duration_time_i: 2.0      demand_i: 120.0      work load_i: 120.0      work load gap_i: 0
139         V_id: 3      li: 4.0      xi: 11.0      bow of i: 9.0      tail of i: 13.0      gama_i0: 0.0      gama_i1: 3
140         duration_time_i: 3.0      demand_i: 140.0      work load_i: 140.0      work load gap_i: 0
141         V_id: 4      li: 3.0      xi: 14.5      bow of i: 13.0      tail of i: 16.0      gama_i0: 4.0      gama_i1: 7
142         duration_time_i: 3.0      demand_i: 120.0      work load_i: 120.0      work load gap_i: 0
143         V_id: 5      li: 7.0      xi: 19.5      bow of i: 16.0      tail of i: 23.0      gama_i0: 0.0      gama_i1: 3
144         duration_time_i: 3.0      demand_i: 120.0      work load_i: 120.0      work load gap_i: 0
145         V_id: 6      li: 8.0      xi: 26.0      bow of i: 22.0      tail of i: 30.0      gama_i0: 3.0      gama_i1: 5
146         duration_time_i: 2.0      demand_i: 120.0      work load_i: 120.0      work load gap_i: 0
147         V_id: 7      li: 9.0      xi: 4.5      bow of i: 0.0      tail of i: 9.0      gama_i0: 7.0      gama_i1: 9.0
148         duration_time_i: 2.0      demand_i: 80.0      work load_i: 80.0      work load gap_i: 0
149         V_id: 8      li: 3.0      xi: 1.5      bow of i: 0.0      tail of i: 3.0      gama_i0: 9.0      gama_i1: 11.0
150         duration_time_i: 2.0      demand_i: 80.0      work load_i: 80.0      work load gap_i: 0
151         V_id: 9      li: 3.0      xi: 1.5      bow of i: 0.0      tail of i: 3.0      gama_i0: 11.0      gama_i1: 13.0
152         duration_time_i: 2.0      demand_i: 120.0      work load_i: 120.0      work load gap_i: 0
153         V_id: 10     li: 9.0      xi: 4.5      bow of i: 0.0      tail of i: 9.0      gama_i0: 13.0      gama_i1: 15.
154         duration_time_i: 2.0      demand_i: 160.0      work load_i: 160.0      work load gap_i: 0
155         V_id: 11     li: 9.0      xi: 4.5      bow of i: 0.0      tail of i: 9.0      gama_i0: 0.0      gama_i1: 1.0
156         duration_time_i: 1.0      demand_i: 160.0      work load_i: 160.0      work load gap_i: 0
157
158 Algorithm finished and the total CPU time: 1233 s
159 End
160

```