


```

80     second level: [1. 1.]
81     third level: [4. 5.] ]
82     The No. 5 iteration is finished!
83
84 Beging the No. 6 iteration:
85     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
86     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 1
87     solution chromosome =
88         first level: [ [2. 8.]
89         second level: [1. 1.]
90         third level: [4. 5.] ]
91     The No. 6 iteration is finished!
92
93 Beging the No. 7 iteration:
94     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
95     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 2
96     solution chromosome =
97         first level: [ [2. 8.]
98         second level: [1. 1.]
99         third level: [4. 5.] ]
100    The No. 7 iteration is finished!
101
102 Beging the No. 8 iteration:
103     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
104     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 3
105     solution chromosome =
106         first level: [ [2. 8.]
107         second level: [1. 1.]
108         third level: [4. 5.] ]
109    The No. 8 iteration is finished!
110
111 Beging the No. 9 iteration:
112     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
113     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 4
114     solution chromosome =
115         first level: [ [2. 8.]
116         second level: [1. 1.]
117         third level: [4. 5.] ]
118    The No. 9 iteration is finished!
119
120 Beging the No. 10 iteration:
121     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
122     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 5
123     solution chromosome =
124         first level: [ [2. 8.]
125         second level: [1. 1.]
126         third level: [4. 5.] ]
127    The No. 10 iteration is finished!
128
129 Beging the No. 11 iteration:
130     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
131     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 6
132     solution chromosome =
133         first level: [ [2. 8.]
134         second level: [1. 1.]
135         third level: [4. 5.] ]
136    The No. 11 iteration is finished!
137
138 Beging the No. 12 iteration:
139     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
140     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 7
141     solution chromosome =
142         first level: [ [2. 8.]
143         second level: [1. 1.]
144         third level: [4. 5.] ]
145    The No. 12 iteration is finished!
146
147 Beging the No. 13 iteration:
148     obj[gen-1] = 4.00    temp_best_value_gen = 4.00
149     No, maintain solution and obj[gen] = 4.00 , and the tolerance_counter = 8
150     solution chromosome =
151         first level: [ [2. 8.]
152         second level: [1. 1.]
153         third level: [4. 5.] ]
154    The No. 13 iteration is finished!
155
156
157 -----
158 The iteration is terminated and then visulize the solution:
159     solution chromosome =
160         first level: [ [2. 8.]
161         second level: [1. 1.]
162         third level: [4. 5.] ]
163     Objective function values and some other indicators:

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unknown

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164      Obj0 = 2.00      Obj1 = 2.00      Obj0 + Obj1 = 4.00
165      Total movement of crane: 0.00
166      Total waiting time in berth position: 2.00
167      Total index of q during berthing: 46.00
168      Specific arrangement for each vessel:
169      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: 3.0
170      duration_time_i: 2.0      demand_i: 160.0      work load_i: 160.0      work load gap_i: 0
171      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: 3.0
172      duration_time_i: 2.0      demand_i: 120.0      work load_i: 120.0      work load gap_i: 0
173      Algorithm finished and the total CPU time: 115 s
174      End
```