

```

1 "E:\1_□□□□\3_□□□□\1_□□□□\1_□□□□□□\1_□□□□□□\1_LW_□□□□2\6_□□□□\2 python code\01_My_Python_Code\Scripts\python.
exe" "D:\Python\Pycharm\setroute\PyCharm Community Edition 2021.2.3\plugins\python-ce\helpers\pydev\pydevconsole.py" --mode=client --port=3262
2
3 import sys; print('Python %s on %s' % (sys.version, sys.platform))
4 sys.path.extend(['E:\1_□□□□\3_□□□□\1_□□□□□□\1_□□□□□□\1_LW_□□□□2\6_□□□□\2 python code\01_My_Python_Code',
  'E:/1_□□□□\3_□□□□\1_□□□□□□\1_□□□□□□\1_LW_□□□□2\6_□□□□\2 python code\01_My_Python_Code'])
5
6 PyDev console: starting.
7
8 Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC v.1929 64 bit (AMD64)] on win32
9 >>> runfile('E:/1_□□□□\3_□□□□\1_□□□□□□\1_□□□□□□\1_LW_□□□□2\6_□□□□\2 python code\01_My_Python_Code/main_BACASP_offical_PSO_2D_Bin_berth_line.py', wdir='E:/1_□□□□\3_□□□□\1_□□□□□□\1_□□□□□□\1_LW_□□□□2\6_□□□□\2 python code\01_My_Python_Code')
10 Backend TkAgg is interactive backend. Turning interactive mode on.
11 Waiting 1s.....
12
13 This is the R_100_1_standerd_test.xlsx optimization process.
14
15 Start
16   Read basic data
17     V = 100
18     T = 72
19     Q = 23
20     L = 30
21     Max_CPUTime = 3600
22     Coe_Obj1 = 5
23     Coe_Obj2 = 0.01
24   PSO parameter setting:
25     Trail = 31
26     maxIter_num = 100
27     W_inertia = 2.0
28     oder_type_num = 25
29     c1 = 1.5
30     c2 = 1.5
31     r1 = 0.2638058774536918
32     r2 = 0.6910489645483945
33 Begin iteration:
34
35 iter = 0
36   cord_individual_obj[indivial_i, :] = [ 0.  68.  3384.  373.84]
37   cord_individual_obj[indivial_i, :] = [1.000e+00 6.800e+01 3.510e+03 3.751e+02]
38   cord_individual_obj[indivial_i, :] = [2.0000e+00 7.0000e+01 3.2810e+03 3.8281e+02]
39   cord_individual_obj[indivial_i, :] = [3.0000e+00 6.7000e+01 3.1950e+03 3.6695e+02]
40   cord_individual_obj[indivial_i, :] = [ 4.  70.  3650.  386.5]
41   cord_individual_obj[indivial_i, :] = [ 5.  66.  3310.  363.1]
42   cord_individual_obj[indivial_i, :] = [ 6.  71.  3380.  388.8]
43   cord_individual_obj[indivial_i, :] = [ 7.  69.  3487.  379.87]
44   cord_individual_obj[indivial_i, :] = [ 8.  68.  3304.  373.04]
45   cord_individual_obj[indivial_i, :] = [ 9.  67.  3406.  369.06]
46   cord_individual_obj[indivial_i, :] = [10.  70.  3316.  383.16]
47   cord_individual_obj[indivial_i, :] = [11.  71.  3381.  388.81]
48   cord_individual_obj[indivial_i, :] = [12.  71.  3471.  389.71]
49   cord_individual_obj[indivial_i, :] = [13.  69.  3291.  377.91]
50   cord_individual_obj[indivial_i, :] = [14.  70.  3497.  384.97]
51   cord_individual_obj[indivial_i, :] = [15.  67.  3315.  368.15]
52   cord_individual_obj[indivial_i, :] = [16.  68.  3228.  372.28]
53   cord_individual_obj[indivial_i, :] = [17.  70.  3328.  383.28]
54   cord_individual_obj[indivial_i, :] = [18.  68.  3417.  374.17]
55   cord_individual_obj[indivial_i, :] = [19.  69.  3400.  379.]
56   cord_individual_obj[indivial_i, :] = [20.  68.  3515.  375.15]
57   cord_individual_obj[indivial_i, :] = [21.  68.  3218.  372.18]
58   cord_individual_obj[indivial_i, :] = [22.  67.  3290.  367.9]
59   cord_individual_obj[indivial_i, :] = [23.  70.  3382.  383.82]
60   cord_individual_obj[indivial_i, :] = [24.  68.  3390.  373.9]
61
62 min(cord_individual_obj[:, 3]) = 363.1
63 historl_G_best_iter[iter, 3] = 363.1
64 Begin iteration:
65
66 iter = 1
67   cord_individual_obj[indivial_i, :] = [ 0.  67.  3447.  369.47]
68   cord_individual_obj[indivial_i, :] = [1.000e+00 6.7000e+01 3.6550e+03 3.7155e+02]
69   cord_individual_obj[indivial_i, :] = [2.0000e+00 6.5000e+01 2.9550e+03 3.5455e+02]
70   cord_individual_obj[indivial_i, :] = [3.0000e+00 6.9000e+01 3.1040e+03 3.7604e+02]
71   cord_individual_obj[indivial_i, :] = [ 4.  64.  3554.  355.54]
72   cord_individual_obj[indivial_i, :] = [ 5.  68.  3252.  372.52]
73   cord_individual_obj[indivial_i, :] = [ 6.  66.  3240.  362.4]
74   cord_individual_obj[indivial_i, :] = [ 7.  63.  3240.  347.4]
75   cord_individual_obj[indivial_i, :] = [ 8.  68.  3350.  373.5]
76   cord_individual_obj[indivial_i, :] = [ 9.  70.  3333.  383.33]
77   cord_individual_obj[indivial_i, :] = [10.  69.  3295.  377.95]
78   cord_individual_obj[indivial_i, :] = [11.  68.  3390.  373.9]
79   cord_individual_obj[indivial_i, :] = [12.  66.  3310.  363.1]

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80 cord_individual_obj[indivial_i,:] = [ 13. 70. 3164. 381.64]
81 cord_individual_obj[indivial_i,:] = [ 14. 67. 3318. 368.18]
82 cord_individual_obj[indivial_i,:] = [ 15. 68. 3369. 373.69]
83 cord_individual_obj[indivial_i,:] = [ 16. 70. 3289. 382.89]
84 cord_individual_obj[indivial_i,:] = [ 17. 65. 3283. 357.83]
85 cord_individual_obj[indivial_i,:] = [ 18. 68. 3293. 372.93]
86 cord_individual_obj[indivial_i,:] = [ 19. 67. 3403. 369.03]
87 cord_individual_obj[indivial_i,:] = [ 20. 70. 3372. 383.72]
88 cord_individual_obj[indivial_i,:] = [ 21. 67. 3245. 367.45]
89 cord_individual_obj[indivial_i,:] = [ 22. 69. 3293. 377.93]
90 cord_individual_obj[indivial_i,:] = [ 23. 70. 3506. 385.06]
91 cord_individual_obj[indivial_i,:] = [ 24. 68. 3297. 372.97]
92
93 min(cord_individual_obj[:,3]) = 347.4
94 historl_G_best_iter[iter,3] = 347.4
95 Begin iteration:
96
97 iter = 2
98 cord_individual_obj[indivial_i,:] = [ 0. 65. 3369. 358.69]
99 cord_individual_obj[indivial_i,:] = [1.0000e+00 6.9000e+01 3.4260e+03 3.7926e+02]
100 cord_individual_obj[indivial_i,:] = [2.0000e+00 6.9000e+01 3.4790e+03 3.7979e+02]
101 cord_individual_obj[indivial_i,:] = [3.0000e+00 6.9000e+01 3.4920e+03 3.7992e+02]
102 cord_individual_obj[indivial_i,:] = [ 4. 64. 3340. 353.4]
103 cord_individual_obj[indivial_i,:] = [ 5. 68. 3460. 374.6]
104 cord_individual_obj[indivial_i,:] = [ 6. 68. 3396. 373.96]
105 cord_individual_obj[indivial_i,:] = [ 7. 66. 3278. 362.78]
106 cord_individual_obj[indivial_i,:] = [ 8. 65. 3290. 357.9]
107 cord_individual_obj[indivial_i,:] = [ 9. 67. 3324. 368.24]
108 cord_individual_obj[indivial_i,:] = [ 10. 68. 3440. 374.4]
109 cord_individual_obj[indivial_i,:] = [ 11. 66. 3335. 363.35]
110 cord_individual_obj[indivial_i,:] = [ 12. 69. 3416. 379.16]
111 cord_individual_obj[indivial_i,:] = [ 13. 71. 3393. 388.93]
112 cord_individual_obj[indivial_i,:] = [ 14. 68. 3375. 373.75]
113 cord_individual_obj[indivial_i,:] = [ 15. 69. 3491. 379.91]
114 cord_individual_obj[indivial_i,:] = [ 16. 66. 3332. 363.32]
115 cord_individual_obj[indivial_i,:] = [ 17. 66. 3275. 362.75]
116 cord_individual_obj[indivial_i,:] = [ 18. 69. 3519. 380.19]
117 cord_individual_obj[indivial_i,:] = [ 19. 69. 3494. 379.94]
118 cord_individual_obj[indivial_i,:] = [ 20. 65. 3330. 358.3]
119 cord_individual_obj[indivial_i,:] = [ 21. 69. 3481. 379.81]
120 cord_individual_obj[indivial_i,:] = [ 22. 66. 3343. 363.43]
121 cord_individual_obj[indivial_i,:] = [ 23. 63. 3240. 347.4]
122 cord_individual_obj[indivial_i,:] = [ 24. 65. 3329. 358.29]
123
124 min(cord_individual_obj[:,3]) = 347.4
125 historl_G_best_iter[iter,3] = 347.4
126 Begin iteration:
127
128 iter = 3
129 cord_individual_obj[indivial_i,:] = [ 0. 70. 3436. 384.36]
130 cord_individual_obj[indivial_i,:] = [1.0000e+00 6.7000e+01 3.3460e+03 3.6846e+02]
131 cord_individual_obj[indivial_i,:] = [2.0000e+00 6.5000e+01 3.2550e+03 3.5755e+02]
132 cord_individual_obj[indivial_i,:] = [3.0000e+00 6.8000e+01 3.5060e+03 3.7506e+02]
133 cord_individual_obj[indivial_i,:] = [ 4. 70. 3490. 384.9]
134 cord_individual_obj[indivial_i,:] = [ 5. 65. 3220. 357.2]
135 cord_individual_obj[indivial_i,:] = [ 6. 64. 3410. 354.1]
136 cord_individual_obj[indivial_i,:] = [ 7. 70. 3467. 384.67]
137 cord_individual_obj[indivial_i,:] = [ 8. 67. 3319. 368.19]
138 cord_individual_obj[indivial_i,:] = [ 9. 69. 3258. 377.58]
139 cord_individual_obj[indivial_i,:] = [ 10. 68. 3334. 373.34]
140 cord_individual_obj[indivial_i,:] = [ 11. 69. 3327. 378.27]
141 cord_individual_obj[indivial_i,:] = [ 12. 68. 3373. 373.73]
142 cord_individual_obj[indivial_i,:] = [ 13. 63. 3240. 347.4]
143 cord_individual_obj[indivial_i,:] = [ 14. 66. 3383. 363.83]
144 cord_individual_obj[indivial_i,:] = [ 15. 67. 3380. 368.8]
145 cord_individual_obj[indivial_i,:] = [ 16. 69. 3434. 379.34]
146 cord_individual_obj[indivial_i,:] = [ 17. 65. 3326. 358.26]
147 cord_individual_obj[indivial_i,:] = [ 18. 66. 3370. 363.7]
148 cord_individual_obj[indivial_i,:] = [ 19. 66. 3311. 363.11]
149 cord_individual_obj[indivial_i,:] = [ 20. 70. 3548. 385.48]
150 cord_individual_obj[indivial_i,:] = [ 21. 70. 3413. 384.13]
151 cord_individual_obj[indivial_i,:] = [ 22. 70. 3063. 380.63]
152 cord_individual_obj[indivial_i,:] = [ 23. 67. 3425. 369.25]
153 cord_individual_obj[indivial_i,:] = [ 24. 67. 3387. 368.87]
154
155 min(cord_individual_obj[:,3]) = 347.4
156 historl_G_best_iter[iter,3] = 347.4
157 Begin iteration:
158
159 iter = 4
160 cord_individual_obj[indivial_i,:] = [ 0. 70. 3521. 385.21]
161 cord_individual_obj[indivial_i,:] = [1.00e+00 7.00e+01 3.40e+03 3.84e+02]
162 cord_individual_obj[indivial_i,:] = [2.0000e+00 7.0000e+01 3.4570e+03 3.8457e+02]
163 cord_individual_obj[indivial_i,:] = [3.0000e+00 6.9000e+01 3.2760e+03 3.7776e+02]

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164 cord_individual_obj[indivial_i,:] = [ 4. 68. 3456. 374.56]
165 cord_individual_obj[indivial_i,:] = [ 5. 69. 3452. 379.52]
166 cord_individual_obj[indivial_i,:] = [ 6. 68. 3410. 374.1]
167 cord_individual_obj[indivial_i,:] = [ 7. 66. 3431. 364.31]
168 cord_individual_obj[indivial_i,:] = [ 8. 64. 3367. 353.67]
169 cord_individual_obj[indivial_i,:] = [ 9. 70. 3549. 385.49]
170 cord_individual_obj[indivial_i,:] = [ 10. 70. 3218. 382.18]
171 cord_individual_obj[indivial_i,:] = [ 11. 65. 3261. 357.61]
172 cord_individual_obj[indivial_i,:] = [ 12. 69. 3504. 380.04]
173 cord_individual_obj[indivial_i,:] = [ 13. 70. 3497. 384.97]
174 cord_individual_obj[indivial_i,:] = [ 14. 68. 3501. 375.01]
175 cord_individual_obj[indivial_i,:] = [ 15. 66. 3407. 364.07]
176 cord_individual_obj[indivial_i,:] = [ 16. 67. 3389. 368.89]
177 cord_individual_obj[indivial_i,:] = [ 17. 67. 3402. 369.02]
178 cord_individual_obj[indivial_i,:] = [ 18. 67. 3355. 368.55]
179 cord_individual_obj[indivial_i,:] = [ 19. 66. 3430. 364.3]
180 cord_individual_obj[indivial_i,:] = [ 20. 63. 3240. 347.4]
181 cord_individual_obj[indivial_i,:] = [ 21. 70. 3452. 384.52]
182 cord_individual_obj[indivial_i,:] = [ 22. 70. 3551. 385.51]
183 cord_individual_obj[indivial_i,:] = [ 23. 68. 3340. 373.4]
184 cord_individual_obj[indivial_i,:] = [ 24. 66. 3359. 363.59]
185
186 min(cord_individual_obj[:,3]) = 347.4
187 historl_G_best_iter[iter,3] = 347.4
188 Begin iteration:
189
190 iter = 5
191 cord_individual_obj[indivial_i,:] = [ 0. 68. 3192. 371.92]
192 cord_individual_obj[indivial_i,:] = [1.0000e+00 7.0000e+01 3.2740e+03 3.8274e+02]
193 cord_individual_obj[indivial_i,:] = [2.0000e+00 6.9000e+01 3.2260e+03 3.7726e+02]
194 cord_individual_obj[indivial_i,:] = [3.0000e+00 6.7000e+01 3.4530e+03 3.6953e+02]
195 cord_individual_obj[indivial_i,:] = [ 4. 69. 3469. 379.69]
196 cord_individual_obj[indivial_i,:] = [ 5. 70. 3382. 383.82]
197 cord_individual_obj[indivial_i,:] = [ 6. 68. 3339. 373.39]
198 cord_individual_obj[indivial_i,:] = [ 7. 71. 3313. 388.13]
199 cord_individual_obj[indivial_i,:] = [ 8. 67. 3318. 368.18]
200 cord_individual_obj[indivial_i,:] = [ 9. 69. 3187. 376.87]
201 cord_individual_obj[indivial_i,:] = [ 10. 69. 3330. 378.3]
202 cord_individual_obj[indivial_i,:] = [ 11. 64. 3145. 351.45]
203 cord_individual_obj[indivial_i,:] = [ 12. 66. 3379. 363.79]
204 cord_individual_obj[indivial_i,:] = [ 13. 69. 3424. 379.24]
205 cord_individual_obj[indivial_i,:] = [ 14. 67. 3342. 368.42]
206 cord_individual_obj[indivial_i,:] = [ 15. 71. 3419. 389.19]
207 cord_individual_obj[indivial_i,:] = [ 16. 65. 3430. 359.3]
208 cord_individual_obj[indivial_i,:] = [ 17. 65. 3337. 358.37]
209 cord_individual_obj[indivial_i,:] = [ 18. 65. 3176. 356.76]
210 cord_individual_obj[indivial_i,:] = [ 19. 68. 3357. 373.57]
211 cord_individual_obj[indivial_i,:] = [ 20. 66. 3259. 362.59]
212 cord_individual_obj[indivial_i,:] = [ 21. 69. 3614. 381.14]
213 cord_individual_obj[indivial_i,:] = [ 22. 63. 3240. 347.4]
214 cord_individual_obj[indivial_i,:] = [ 23. 64. 3012. 350.12]
215 cord_individual_obj[indivial_i,:] = [ 24. 68. 3303. 373.03]
216
217 min(cord_individual_obj[:,3]) = 347.4
218 historl_G_best_iter[iter,3] = 347.4
219 Begin iteration:
220
221 iter = 6
222 cord_individual_obj[indivial_i,:] = [ 0. 67. 3375. 368.75]
223 cord_individual_obj[indivial_i,:] = [1.0000e+00 6.7000e+01 3.4210e+03 3.6921e+02]
224 cord_individual_obj[indivial_i,:] = [2.0000e+00 6.9000e+01 3.4760e+03 3.7976e+02]
225 cord_individual_obj[indivial_i,:] = [3.0000e+00 6.8000e+01 3.5060e+03 3.7506e+02]
226 cord_individual_obj[indivial_i,:] = [ 4. 70. 3203. 382.03]
227 cord_individual_obj[indivial_i,:] = [ 5. 69. 3474. 379.74]
228 cord_individual_obj[indivial_i,:] = [ 6. 67. 3350. 368.5]
229 cord_individual_obj[indivial_i,:] = [ 7. 68. 3476. 374.76]
230 cord_individual_obj[indivial_i,:] = [ 8. 69. 3322. 378.22]
231 cord_individual_obj[indivial_i,:] = [ 9. 67. 3388. 368.88]
232 cord_individual_obj[indivial_i,:] = [ 10. 65. 3369. 358.69]
233 cord_individual_obj[indivial_i,:] = [ 11. 65. 3378. 358.78]
234 cord_individual_obj[indivial_i,:] = [ 12. 67. 3475. 369.75]
235 cord_individual_obj[indivial_i,:] = [ 13. 68. 3496. 374.96]
236 cord_individual_obj[indivial_i,:] = [ 14. 67. 3360. 368.6]
237 cord_individual_obj[indivial_i,:] = [ 15. 63. 3240. 347.4]
238 cord_individual_obj[indivial_i,:] = [ 16. 70. 3463. 384.63]
239 cord_individual_obj[indivial_i,:] = [ 17. 67. 3393. 368.93]
240 cord_individual_obj[indivial_i,:] = [ 18. 67. 3423. 369.23]
241 cord_individual_obj[indivial_i,:] = [ 19. 69. 3537. 380.37]
242 cord_individual_obj[indivial_i,:] = [ 20. 66. 3413. 364.13]
243 cord_individual_obj[indivial_i,:] = [ 21. 69. 3466. 379.66]
244 cord_individual_obj[indivial_i,:] = [ 22. 66. 3402. 364.02]
245 cord_individual_obj[indivial_i,:] = [ 23. 70. 3411. 384.11]
246 cord_individual_obj[indivial_i,:] = [ 24. 64. 3291. 352.91]
247

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unknown

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248 min(cord_individual_obj[:, 3]) = 347.4
249 historl_G_best_iter[iter, 3] = 347.4
250 Begin iteration:
251
252 iter = 7
253 cord_individual_obj[indivial_i, :] = [ 0.  70.  3416.  384.16]
254 cord_individual_obj[indivial_i, :] = [1.0000e+00 6.9000e+01 3.4660e+03 3.7966e+02]
255 cord_individual_obj[indivial_i, :] = [2.0000e+00 7.0000e+01 3.4070e+03 3.8407e+02]
256 cord_individual_obj[indivial_i, :] = [3.0000e+00 6.8000e+01 3.4140e+03 3.7414e+02]
257 cord_individual_obj[indivial_i, :] = [ 4.  68.  3267.  372.67]
258 cord_individual_obj[indivial_i, :] = [ 5.  71.  3285.  387.85]
259 cord_individual_obj[indivial_i, :] = [ 6.  71.  3571.  390.71]
260 cord_individual_obj[indivial_i, :] = [ 7.  69.  3511.  380.11]
261 cord_individual_obj[indivial_i, :] = [ 8.  71.  3397.  388.97]
262 cord_individual_obj[indivial_i, :] = [ 9.  69.  3373.  378.73]
263 cord_individual_obj[indivial_i, :] = [10.  68.  3403.  374.03]
264 cord_individual_obj[indivial_i, :] = [11.  70.  3585.  385.85]
265 cord_individual_obj[indivial_i, :] = [12.  65.  3242.  357.42]
266 cord_individual_obj[indivial_i, :] = [13.  70.  3430.  384.3]
267 cord_individual_obj[indivial_i, :] = [14.  65.  3356.  358.56]
268 cord_individual_obj[indivial_i, :] = [15.  66.  3395.  363.95]
269 cord_individual_obj[indivial_i, :] = [16.  63.  3240.  347.4]
270 cord_individual_obj[indivial_i, :] = [17.  69.  3310.  378.1]
271 cord_individual_obj[indivial_i, :] = [18.  67.  3357.  368.57]
272 cord_individual_obj[indivial_i, :] = [19.  68.  3368.  373.68]
273 cord_individual_obj[indivial_i, :] = [20.  65.  3335.  358.35]
274 cord_individual_obj[indivial_i, :] = [21.  65.  3340.  358.4]
275 cord_individual_obj[indivial_i, :] = [22.  66.  3330.  363.3]
276 cord_individual_obj[indivial_i, :] = [23.  70.  3563.  385.63]
277 cord_individual_obj[indivial_i, :] = [24.  64.  3211.  352.11]
278
279 min(cord_individual_obj[:, 3]) = 347.4
280 historl_G_best_iter[iter, 3] = 347.4
281 Begin iteration:
282
283 iter = 8
284 cord_individual_obj[indivial_i, :] = [ 0.  70.  3259.  382.59]
285 cord_individual_obj[indivial_i, :] = [1.0000e+00 7.0000e+01 3.4870e+03 3.8487e+02]
286 cord_individual_obj[indivial_i, :] = [2.0000e+00 6.8000e+01 3.3890e+03 3.7389e+02]
287 cord_individual_obj[indivial_i, :] = [3.0000e+00 6.7000e+01 3.3760e+03 3.6876e+02]
288 cord_individual_obj[indivial_i, :] = [ 4.  66.  3312.  363.12]
289 cord_individual_obj[indivial_i, :] = [ 5.  68.  3359.  373.59]
290 cord_individual_obj[indivial_i, :] = [ 6.  63.  3240.  347.4]
291 cord_individual_obj[indivial_i, :] = [ 7.  70.  3439.  384.39]
292 cord_individual_obj[indivial_i, :] = [ 8.  68.  3360.  373.6]
293 cord_individual_obj[indivial_i, :] = [ 9.  70.  3336.  383.36]
294 cord_individual_obj[indivial_i, :] = [10.  70.  3467.  384.67]
295 cord_individual_obj[indivial_i, :] = [11.  70.  3507.  385.07]
296 cord_individual_obj[indivial_i, :] = [12.  69.  3430.  379.3]
297 cord_individual_obj[indivial_i, :] = [13.  70.  3442.  384.42]
298 cord_individual_obj[indivial_i, :] = [14.  68.  3431.  374.31]
299 cord_individual_obj[indivial_i, :] = [15.  69.  3566.  380.66]
300 cord_individual_obj[indivial_i, :] = [16.  66.  3307.  363.07]
301 cord_individual_obj[indivial_i, :] = [17.  67.  3266.  367.66]
302 cord_individual_obj[indivial_i, :] = [18.  67.  3422.  369.22]
303 cord_individual_obj[indivial_i, :] = [19.  67.  3373.  368.73]
304 cord_individual_obj[indivial_i, :] = [20.  63.  3319.  348.19]
305 cord_individual_obj[indivial_i, :] = [21.  69.  3316.  378.16]
306 cord_individual_obj[indivial_i, :] = [22.  70.  3543.  385.43]
307 cord_individual_obj[indivial_i, :] = [23.  66.  3527.  365.27]
308 cord_individual_obj[indivial_i, :] = [24.  64.  3118.  351.18]
309
310 min(cord_individual_obj[:, 3]) = 347.4
311 historl_G_best_iter[iter, 3] = 347.4
312 Begin iteration:
313
314 iter = 9
315 cord_individual_obj[indivial_i, :] = [ 0.  68.  3286.  372.86]
316 cord_individual_obj[indivial_i, :] = [1.0000e+00 6.8000e+01 3.2840e+03 3.7284e+02]
317 cord_individual_obj[indivial_i, :] = [2.0000e+00 6.9000e+01 3.310e+03 3.781e+02]
318 cord_individual_obj[indivial_i, :] = [3.0000e+00 6.8000e+01 3.2860e+03 3.7286e+02]
319 cord_individual_obj[indivial_i, :] = [ 4.  68.  3127.  371.27]
320 cord_individual_obj[indivial_i, :] = [ 5.  65.  3186.  356.86]
321 cord_individual_obj[indivial_i, :] = [ 6.  67.  3467.  369.67]
322 cord_individual_obj[indivial_i, :] = [ 7.  69.  3465.  379.65]
323 cord_individual_obj[indivial_i, :] = [ 8.  68.  3312.  373.12]
324 cord_individual_obj[indivial_i, :] = [ 9.  66.  3256.  362.56]
325 cord_individual_obj[indivial_i, :] = [10.  70.  3240.  382.4]
326 cord_individual_obj[indivial_i, :] = [11.  69.  3460.  379.6]
327 cord_individual_obj[indivial_i, :] = [12.  71.  3570.  390.7]
328 cord_individual_obj[indivial_i, :] = [13.  68.  3500.  375.]
329 cord_individual_obj[indivial_i, :] = [14.  65.  3282.  357.82]
330 cord_individual_obj[indivial_i, :] = [15.  69.  3308.  378.08]
331 cord_individual_obj[indivial_i, :] = [16.  67.  3387.  368.87]
```

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332 cord_individual_obj[indivial_i,:] = [ 17. 69. 3392. 378.92]
333 cord_individual_obj[indivial_i,:] = [ 18. 66. 3289. 362.89]
334 cord_individual_obj[indivial_i,:] = [ 19. 67. 3265. 367.65]
335 cord_individual_obj[indivial_i,:] = [ 20. 68. 3341. 373.41]
336 cord_individual_obj[indivial_i,:] = [ 21. 67. 3450. 369.5]
337 cord_individual_obj[indivial_i,:] = [ 22. 63. 3240. 347.4]
338 cord_individual_obj[indivial_i,:] = [ 23. 66. 3308. 363.08]
339 cord_individual_obj[indivial_i,:] = [ 24. 69. 3554. 380.54]
340
341 min(cord_individual_obj[:, 3]) = 347.4
342 historl_G_best_iter[iter, 3] = 347.4
343 Begin iteration:
344
345 iter = 10
346 cord_individual_obj[indivial_i,:] = [ 0. 68. 3417. 374.17]
347 cord_individual_obj[indivial_i,:] = [1.0000e+00 6.9000e+01 3.4220e+03 3.7922e+02]
348 cord_individual_obj[indivial_i,:] = [2.0000e+00 6.8000e+01 3.3490e+03 3.7349e+02]
349 cord_individual_obj[indivial_i,:] = [3.0000e+00 6.8000e+01 3.4130e+03 3.7413e+02]
350 cord_individual_obj[indivial_i,:] = [ 4. 66. 3309. 363.09]
351 cord_individual_obj[indivial_i,:] = [ 5. 70. 3408. 384.08]
352 cord_individual_obj[indivial_i,:] = [ 6. 69. 3527. 380.27]
353 cord_individual_obj[indivial_i,:] = [ 7. 68. 3384. 373.84]
354 cord_individual_obj[indivial_i,:] = [ 8. 70. 3453. 384.53]
355 cord_individual_obj[indivial_i,:] = [ 9. 69. 3368. 378.68]
356 cord_individual_obj[indivial_i,:] = [ 10. 67. 3443. 369.43]
357 cord_individual_obj[indivial_i,:] = [ 11. 65. 3266. 357.66]
358 cord_individual_obj[indivial_i,:] = [ 12. 63. 3240. 347.4]
359 cord_individual_obj[indivial_i,:] = [ 13. 68. 3426. 374.26]
360 cord_individual_obj[indivial_i,:] = [ 14. 68. 3524. 375.24]
361 cord_individual_obj[indivial_i,:] = [ 15. 71. 3600. 391.]
362 cord_individual_obj[indivial_i,:] = [ 16. 70. 3529. 385.29]
363 cord_individual_obj[indivial_i,:] = [ 17. 70. 3455. 384.55]
364 cord_individual_obj[indivial_i,:] = [ 18. 65. 3317. 358.17]
365 cord_individual_obj[indivial_i,:] = [ 19. 68. 3437. 374.37]
366 cord_individual_obj[indivial_i,:] = [ 20. 67. 3413. 369.13]
367 cord_individual_obj[indivial_i,:] = [ 21. 68. 3491. 374.91]
368 cord_individual_obj[indivial_i,:] = [ 22. 69. 3628. 381.28]
369 cord_individual_obj[indivial_i,:] = [ 23. 64. 3355. 353.55]
370 cord_individual_obj[indivial_i,:] = [ 24. 69. 3421. 379.21]
371
372 min(cord_individual_obj[:, 3]) = 347.4
373 historl_G_best_iter[iter, 3] = 347.4
374 Iteration calculate over
375
376
377
378
379 All item are in Bin and:
380 Bin area = 2160
381 Real_area = 1641.0
382 Proportion_of_area = 0.7486111111111111
383 BEST_CHROM =
384     berth: [ 3.5 27. 28.5 26. 17.5 3. 2. 16. 24.5 15. 2.5 11. 20.5 10.5
385 23. 3. 22.5 27.5 4.5 28.5 14. 23.5 22. 25. 23.5 12. 18.5 17.5
386 26.5 28.5 8. 3.5 28.5 21.5 23. 4. 25. 2.5 4.5 4.5 12.5 28.
387 28.5 15.5 18. 3.5 15. 7.5 9. 15.5 25. 23. 15. 23. 9. 3.5
388 4.5 8.5 11. 14.5 27. 21.5 24.5 24.5 8.5 14.5 15. 16.5 28.5 24.5
389 4. 17. 9.5 11.5 26.5 17. 28.5 11. 25.5 25.5 20.5 18. 21. 19.5
390 13.5 4.5 3. 9.5 14. 4.5 21. 2.5 2.5 19.5 9.5 8. 21. 27.
391 3.5 13.5]
392     time: [29. 59. 29. 33. 59. 37. 25. 0. 26. 9. 57. 5. 45. 30. 51. 52. 57. 45.
393 48. 0. 36. 53. 19. 23. 2. 45. 32. 61. 17. 56. 33. 11. 51. 4. 10. 46.
394 41. 2. 19. 23. 48. 19. 61. 11. 50. 42. 42. 25. 57. 25. 37. 15. 28. 0.
395 52. 0. 14. 3. 20. 54. 4. 29. 61. 48. 36. 20. 3. 57. 10. 7. 5. 40.
396 0. 23. 6. 7. 54. 40. 35. 29. 34. 47. 17. 36. 15. 17. 33. 11. 34. 39.
397 12. 7. 44. 21. 43. 9. 43. 43. 55. 17.]
398     num_QC: [2. 4. 2. 2. 3. 2. 2. 2. 2. 2. 2. 2. 2. 3. 2. 2. 2. 2. 2. 2. 2.
399 3. 3. 3. 3. 2. 3. 1. 3. 1. 3. 2. 2. 2. 2. 3. 2. 2. 2. 2. 3. 2. 2.
400 2. 2. 2. 3. 2. 2. 2. 3. 3. 2. 2. 3. 2. 3. 2. 2. 2. 2. 2. 2.
401 2. 2. 3. 2. 3. 3. 3. 2. 1. 2. 2. 2. 2. 3. 3. 2. 2. 3. 2. 3. 2.
402 3. 3. 2. 3.]
403 Objective function values and some other indicators:
404 Obj0 = 63.00          Obj1 = 3240.00          Obj0 + Obj1 = 3303.00
405 Total movement of crane: 266.00
406 Total waiting time in berth position: 2974.00
407 Total index of q during berthing: 6610.00
408 Specific arrangement for each vessel:
409     V_id: 0           li: 7.0           xi: 3.5           bow of i: 0.0           tail of i: 7.0           gama_i0: 29.0           gama_i1: 32.0
410     gama_i1 + 1: 33.0           gama_i1 - gama_i0: 3.0           duration_time_i: 4.0           demand_i: 160.0           work
411     load_i: 160.0           work load gap_i: 0
410     V_id: 1           li: 4.0           xi: 27.0           bow of i: 25.0           tail of i: 29.0           gama_i0: 59.0           gama_i1:
60.0           gama_i1 + 1: 61.0           gama_i1 - gama_i0: 1.0           duration_time_i: 2.0           demand_i: 160.0           work
411     load_i: 160.0           work load gap_i: 0
411     V_id: 2           li: 3.0           xi: 28.5           bow of i: 27.0           tail of i: 30.0           gama_i0: 29.0           gama_i1:

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## unknown

411	32.0	gama_i1 + 1: 33.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0	work
412	load_i: 160.0	work load gap_i: 0				
	V_id: 3	li: 6.0	xi: 26.0	bow of i: 23.0	tail of i: 29.0	gama_i0: 33.0
	34.0	gama_i1 + 1: 35.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
413	load_i: 80.0	work load gap_i: 0				
	V_id: 4	li: 9.0	xi: 17.5	bow of i: 13.0	tail of i: 22.0	gama_i0: 59.0
	60.0	gama_i1 + 1: 61.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 120.0
414	load_i: 120.0	work load gap_i: 0				
	V_id: 5	li: 6.0	xi: 3.0	bow of i: 0.0	tail of i: 6.0	gama_i0: 37.0
	load_i: 80.0	work load gap_i: 0			duration_time_i: 2.0	demand_i: 80.0
415	V_id: 6	li: 4.0	xi: 2.0	bow of i: 0.0	tail of i: 4.0	gama_i0: 25.0
	load_i: 100.0	work load gap_i: 0			duration_time_i: 3.0	demand_i: 100.0
416	V_id: 7	li: 8.0	xi: 16.0	bow of i: 12.0	tail of i: 20.0	gama_i0: 0.0
	load_i: 120.0	work load gap_i: 0			duration_time_i: 3.0	demand_i: 120.0
417	V_id: 8	li: 9.0	xi: 24.5	bow of i: 20.0	tail of i: 29.0	gama_i0: 26.0
	28.0	gama_i1 + 1: 29.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 100.0
418	load_i: 100.0	work load gap_i: 0				
	V_id: 9	li: 8.0	xi: 15.0	bow of i: 11.0	tail of i: 19.0	gama_i0: 9.0
	10.0	gama_i1 + 1: 11.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
419	V_id: 10	li: 5.0	xi: 2.5	bow of i: 0.0	tail of i: 5.0	gama_i0: 57.0
	load_i: 80.0	work load gap_i: 0			duration_time_i: 2.0	demand_i: 80.0
420	V_id: 11	li: 6.0	xi: 11.0	bow of i: 8.0	tail of i: 14.0	gama_i0: 5.0
	load_i: 160.0	work load gap_i: 0			duration_time_i: 4.0	demand_i: 160.0
421	V_id: 12	li: 7.0	xi: 20.5	bow of i: 17.0	tail of i: 24.0	gama_i0: 45.0
	46.0	gama_i1 + 1: 47.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 60.0
422	load_i: 60.0	work load gap_i: 0				
	V_id: 13	li: 7.0	xi: 10.5	bow of i: 7.0	tail of i: 14.0	gama_i0: 30.0
	31.0	gama_i1 + 1: 32.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
423	load_i: 80.0	work load gap_i: 0				
	V_id: 14	li: 6.0	xi: 23.0	bow of i: 20.0	tail of i: 26.0	gama_i0: 51.0
	52.0	gama_i1 + 1: 53.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
424	load_i: 80.0	work load gap_i: 0				
	V_id: 15	li: 6.0	xi: 3.0	bow of i: 0.0	tail of i: 6.0	gama_i0: 52.0
	0	gama_i1 + 1: 55.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 140.0
425	load_i: 140.0	work load gap_i: 0				
	V_id: 16	li: 5.0	xi: 22.5	bow of i: 20.0	tail of i: 25.0	gama_i0: 57.0
	58.0	gama_i1 + 1: 59.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
426	load_i: 80.0	work load gap_i: 0				
	V_id: 17	li: 5.0	xi: 27.5	bow of i: 25.0	tail of i: 30.0	gama_i0: 45.0
	47.0	gama_i1 + 1: 48.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 100.0
427	load_i: 100.0	work load gap_i: 0				
	V_id: 18	li: 9.0	xi: 4.5	bow of i: 0.0	tail of i: 9.0	gama_i0: 48.0
	0	gama_i1 + 1: 52.0	gama_i1 - gama_i0: 3.0		duration_time_i: 4.0	demand_i: 140.0
428	load_i: 140.0	work load gap_i: 0				
	V_id: 19	li: 3.0	xi: 28.5	bow of i: 27.0	tail of i: 30.0	gama_i0: 0.0
	2.0	gama_i1 + 1: 3.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 100.0
429	load_i: 100.0	work load gap_i: 0				
	V_id: 20	li: 6.0	xi: 14.0	bow of i: 11.0	tail of i: 17.0	gama_i0: 36.0
	39.0	gama_i1 + 1: 40.0	gama_i1 - gama_i0: 3.0		duration_time_i: 4.0	demand_i: 160.0
430	load_i: 160.0	work load gap_i: 0				
	V_id: 21	li: 7.0	xi: 23.5	bow of i: 20.0	tail of i: 27.0	gama_i0: 53.0
	56.0	gama_i1 + 1: 57.0	gama_i1 - gama_i0: 3.0		duration_time_i: 4.0	demand_i: 140.0
431	load_i: 140.0	work load gap_i: 0				
	V_id: 22	li: 8.0	xi: 22.0	bow of i: 18.0	tail of i: 26.0	gama_i0: 19.0
	20.0	gama_i1 + 1: 21.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 60.0
432	load_i: 60.0	work load gap_i: 0				
	V_id: 23	li: 4.0	xi: 25.0	bow of i: 23.0	tail of i: 27.0	gama_i0: 23.0
	25.0	gama_i1 + 1: 26.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 120.0
433	load_i: 120.0	work load gap_i: 0				
	V_id: 24	li: 7.0	xi: 23.5	bow of i: 20.0	tail of i: 27.0	gama_i0: 2.0
	3.0	gama_i1 + 1: 4.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 120.0
434	load_i: 120.0	work load gap_i: 0				
	V_id: 25	li: 8.0	xi: 12.0	bow of i: 8.0	tail of i: 16.0	gama_i0: 45.0
	47.0	gama_i1 + 1: 48.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 160.0
435	load_i: 160.0	work load gap_i: 0				
	V_id: 26	li: 9.0	xi: 18.5	bow of i: 14.0	tail of i: 23.0	gama_i0: 32.0
	33.0	gama_i1 + 1: 34.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
436	load_i: 80.0	work load gap_i: 0				
	V_id: 27	li: 9.0	xi: 17.5	bow of i: 13.0	tail of i: 22.0	gama_i0: 61.0
	63.0	gama_i1 + 1: 64.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 140.0
437	load_i: 140.0	work load gap_i: 0				
	V_id: 28	li: 5.0	xi: 26.5	bow of i: 24.0	tail of i: 29.0	gama_i0: 17.0
	18.0	gama_i1 + 1: 19.0	gama_i1 - gama_i0: 1.0		duration_time_i: 2.0	demand_i: 80.0
438	load_i: 80.0	work load gap_i: 0				
	V_id: 29	li: 3.0	xi: 28.5	bow of i: 27.0	tail of i: 30.0	gama_i0: 56.0
	58.0	gama_i1 + 1: 59.0	gama_i1 - gama_i0: 2.0		duration_time_i: 3.0	demand_i: 140.0
439	load_i: 140.0	work load gap_i: 0				
	V_id: 30	li: 4.0	xi: 8.0	bow of i: 6.0	tail of i: 10.0	gama_i0: 33.0
						gama_i1:

## unknown

439	35.0	gama_i1 + 1: 36.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 60.0	work	
440	load_i: 60.0	work load gap_i: 0	li: 7.0	xi: 3.5 bow of i: 0.0	tail of i: 7.0	gama_i0: 11.0	gama_i1: 11. work
0	V_id: 31	gama_i1 + 1: 12.0	gama_i1 - gama_i0: 0.0	duration_time_i: 1.0	demand_i: 60.0		
load_i: 60.0	work load gap_i: 0	li: 3.0	xi: 28.5 bow of i: 27.0	tail of i: 30.0	gama_i0: 51.0	gama_i1 work	
: 53.0	V_id: 32	gama_i1 + 1: 54.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 60.0		
load_i: 60.0	work load gap_i: 0	li: 7.0	xi: 21.5 bow of i: 18.0	tail of i: 25.0	gama_i0: 4.0	gama_i1 work	
: 6.0	V_id: 33	gama_i1 + 1: 7.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 8.0	xi: 23.0 bow of i: 19.0	tail of i: 27.0	gama_i0: 10.0	gama_i1 work	
: 11.0	V_id: 34	gama_i1 + 1: 12.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0		
load_i: 80.0	work load gap_i: 0	li: 8.0	xi: 4.0 bow of i: 0.0	tail of i: 8.0	gama_i0: 46.0	gama_i1: 47. work	
0	V_id: 35	gama_i1 + 1: 48.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0		
load_i: 80.0	work load gap_i: 0	li: 8.0	xi: 25.0 bow of i: 21.0	tail of i: 29.0	gama_i0: 41.0	gama_i1 work	
: 42.0	V_id: 36	gama_i1 + 1: 43.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0		
load_i: 60.0	work load gap_i: 0	li: 5.0	xi: 2.5 bow of i: 0.0	tail of i: 5.0	gama_i0: 2.0	gama_i1: 3.0 work load_i:	
60.0	V_id: 37	gama_i1 + 1: 4.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0		
load_i: 60.0	work load gap_i: 0	li: 9.0	xi: 4.5 bow of i: 0.0	tail of i: 9.0	gama_i0: 19.0	gama_i1: 22. work	
0	V_id: 38	gama_i1 + 1: 23.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 140.0		
load_i: 140.0	work load gap_i: 0	li: 9.0	xi: 4.5 bow of i: 0.0	tail of i: 9.0	gama_i0: 23.0	gama_i1: 24. work	
0	V_id: 39	gama_i1 + 1: 25.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 100.0		
load_i: 100.0	work load gap_i: 0	li: 7.0	xi: 12.5 bow of i: 9.0	tail of i: 16.0	gama_i0: 48.0	gama_i1 work	
: 50.0	V_id: 40	gama_i1 + 1: 51.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 100.0		
load_i: 100.0	work load gap_i: 0	li: 4.0	xi: 28.0 bow of i: 26.0	tail of i: 30.0	gama_i0: 19.0	gama_i1 work	
: 22.0	V_id: 41	gama_i1 + 1: 23.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 3.0	xi: 28.5 bow of i: 27.0	tail of i: 30.0	gama_i0: 61.0	gama_i1 work	
: 63.0	V_id: 42	gama_i1 + 1: 64.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0		
load_i: 120.0	work load gap_i: 0	li: 7.0	xi: 15.5 bow of i: 12.0	tail of i: 19.0	gama_i0: 11.0	gama_i1 work	
: 14.0	V_id: 43	gama_i1 + 1: 15.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 4.0	xi: 18.0 bow of i: 16.0	tail of i: 20.0	gama_i0: 50.0	gama_i1 work	
: 53.0	V_id: 44	gama_i1 + 1: 54.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 7.0	xi: 3.5 bow of i: 0.0	tail of i: 7.0	gama_i0: 42.0	gama_i1: 43. work	
0	V_id: 45	gama_i1 + 1: 44.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 100.0		
load_i: 100.0	work load gap_i: 0	li: 4.0	xi: 15.0 bow of i: 13.0	tail of i: 17.0	gama_i0: 42.0	gama_i1 work	
: 44.0	V_id: 46	gama_i1 + 1: 45.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 100.0		
load_i: 100.0	work load gap_i: 0	li: 7.0	xi: 7.5 bow of i: 4.0	tail of i: 11.0	gama_i0: 25.0	gama_i1: work	
: 28.0	V_id: 47	gama_i1 + 1: 29.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 8.0	xi: 9.0 bow of i: 5.0	tail of i: 13.0	gama_i0: 57.0	gama_i1: work	
60.0	V_id: 48	gama_i1 + 1: 61.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 140.0		
load_i: 140.0	work load gap_i: 0	li: 9.0	xi: 15.5 bow of i: 11.0	tail of i: 20.0	gama_i0: 25.0	gama_i1 work	
: 27.0	V_id: 49	gama_i1 + 1: 28.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0		
load_i: 120.0	work load gap_i: 0	li: 6.0	xi: 25.0 bow of i: 22.0	tail of i: 28.0	gama_i0: 37.0	gama_i1 work	
: 40.0	V_id: 50	gama_i1 + 1: 41.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 8.0	xi: 23.0 bow of i: 19.0	tail of i: 27.0	gama_i0: 15.0	gama_i1 work	
: 16.0	V_id: 51	gama_i1 + 1: 17.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0		
load_i: 80.0	work load gap_i: 0	li: 8.0	xi: 15.0 bow of i: 11.0	tail of i: 19.0	gama_i0: 28.0	gama_i1 work	
: 29.0	V_id: 52	gama_i1 + 1: 30.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0		
load_i: 80.0	work load gap_i: 0	li: 6.0	xi: 23.0 bow of i: 20.0	tail of i: 26.0	gama_i0: 0.0	gama_i1 work	
: 1.0	V_id: 53	gama_i1 + 1: 2.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0		
load_i: 80.0	work load gap_i: 0	li: 6.0	xi: 9.0 bow of i: 6.0	tail of i: 12.0	gama_i0: 52.0	gama_i1 work	
: 54.0	V_id: 54	gama_i1 + 1: 55.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 100.0		
load_i: 100.0	work load gap_i: 0	li: 7.0	xi: 3.5 bow of i: 0.0	tail of i: 7.0	gama_i0: 0.0	gama_i1: 1.0 work load_i:	
80.0	V_id: 55	gama_i1 + 1: 2.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0		
load_i: 160.0	work load gap_i: 0	li: 9.0	xi: 4.5 bow of i: 0.0	tail of i: 9.0	gama_i0: 14.0	gama_i1: 16. work	
0	V_id: 56	gama_i1 + 1: 17.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 160.0		
load_i: 160.0	work load gap_i: 0	li: 7.0	xi: 8.5 bow of i: 5.0	tail of i: 12.0	gama_i0: 3.0	gama_i1: 4 work	
.0	V_id: 57	gama_i1 + 1: 5.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 120.0		
load_i: 120.0	work load gap_i: 0	li: 4.0	xi: 11.0 bow of i: 9.0	tail of i: 13.0	gama_i0: 20.0	gama_i1	
467	V_id: 58						

467 : 22.0	gama_i1 + 1: 23.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 100.0	work
load_i: 100.0	work load gap_i: 0	li: 5.0	xi: 14.5 bow of i: 12.0	tail of i: 17.0	gama_i0: 54.0 gama_i1
V_id: 59 : 56.0	gama_i1 + 1: 57.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 4.0	xi: 27.0 bow of i: 25.0	tail of i: 29.0	gama_i0: 4.0 gama_i1
V_id: 60 : 5.0	gama_i1 + 1: 6.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 5.0	xi: 21.5 bow of i: 19.0	tail of i: 24.0	gama_i0: 29.0 gama_i1
V_id: 61 : 31.0	gama_i1 + 1: 32.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 5.0	xi: 24.5 bow of i: 22.0	tail of i: 27.0	gama_i0: 61.0 gama_i1
V_id: 62 : 62.0	gama_i1 + 1: 63.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 9.0	xi: 24.5 bow of i: 20.0	tail of i: 29.0	gama_i0: 48.0 gama_i1
V_id: 63 : 50.0	gama_i1 + 1: 51.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 140.0 work	
load_i: 140.0	work load gap_i: 0	li: 5.0	xi: 8.5 bow of i: 6.0	tail of i: 11.0	gama_i0: 36.0 gama_i1
V_id: 64 : 38.0	gama_i1 + 1: 39.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 3.0	xi: 14.5 bow of i: 13.0	tail of i: 16.0	gama_i0: 20.0 gama_i1
V_id: 65 : 22.0	gama_i1 + 1: 23.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 140.0 work	
load_i: 140.0	work load gap_i: 0	li: 6.0	xi: 15.0 bow of i: 12.0	tail of i: 18.0	gama_i0: 3.0 gama_i1
V_id: 66 : 4.0	gama_i1 + 1: 5.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0 work	
load_i: 80.0	work load gap_i: 0	li: 7.0	xi: 16.5 bow of i: 13.0	tail of i: 20.0	gama_i0: 57.0 gama_i1
V_id: 67 : 58.0	gama_i1 + 1: 59.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0 work	
load_i: 80.0	work load gap_i: 0	li: 3.0	xi: 28.5 bow of i: 27.0	tail of i: 30.0	gama_i0: 10.0 gama_i1
V_id: 68 : 12.0	gama_i1 + 1: 13.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 9.0	xi: 24.5 bow of i: 20.0	tail of i: 29.0	gama_i0: 7.0 gama_i1
V_id: 69 : 9.0	gama_i1 + 1: 10.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 8.0	xi: 4.0 bow of i: 0.0	tail of i: 8.0	gama_i0: 5.0 gama_i1
V_id: 70 : 60.0	gama_i1 + 1: 7.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work load_i:	
load_i: 60.0	work load gap_i: 0	li: 8.0	xi: 17.0 bow of i: 13.0	tail of i: 21.0	gama_i0: 40.0 gama_i1
V_id: 71 : 41.0	gama_i1 + 1: 42.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 5.0	xi: 9.5 bow of i: 7.0	tail of i: 12.0	gama_i0: 0.0 gama_i1
V_id: 72 : .0	gama_i1 + 1: 3.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 100.0 2 work	
load_i: 100.0	work load gap_i: 0	li: 5.0	xi: 11.5 bow of i: 9.0	tail of i: 14.0	gama_i0: 23.0 gama_i1
V_id: 73 : 24.0	gama_i1 + 1: 25.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 3.0	xi: 26.5 bow of i: 25.0	tail of i: 28.0	gama_i0: 6.0 gama_i1
V_id: 74 : 6.0	gama_i1 + 1: 7.0	gama_i1 - gama_i0: 0.0	duration_time_i: 1.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 6.0	xi: 17.0 bow of i: 14.0	tail of i: 20.0	gama_i0: 7.0 gama_i1
V_id: 75 : 8.0	gama_i1 + 1: 9.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 3.0	xi: 28.5 bow of i: 27.0	tail of i: 30.0	gama_i0: 54.0 gama_i1
V_id: 76 : 55.0	gama_i1 + 1: 56.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0 work	
load_i: 80.0	work load gap_i: 0	li: 4.0	xi: 11.0 bow of i: 9.0	tail of i: 13.0	gama_i0: 40.0 gama_i1
V_id: 77 : 42.0	gama_i1 + 1: 43.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 140.0 work	
load_i: 140.0	work load gap_i: 0	li: 5.0	xi: 25.5 bow of i: 23.0	tail of i: 28.0	gama_i0: 35.0 gama_i1
V_id: 78 : 36.0	gama_i1 + 1: 37.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 3.0	xi: 25.5 bow of i: 24.0	tail of i: 27.0	gama_i0: 29.0 gama_i1
V_id: 79 : 31.0	gama_i1 + 1: 32.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 140.0 work	
load_i: 140.0	work load gap_i: 0	li: 5.0	xi: 20.5 bow of i: 18.0	tail of i: 23.0	gama_i0: 34.0 gama_i1
V_id: 80 : 35.0	gama_i1 + 1: 36.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 4.0	xi: 18.0 bow of i: 16.0	tail of i: 20.0	gama_i0: 47.0 gama_i1
V_id: 81 : 49.0	gama_i1 + 1: 50.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 6.0	xi: 21.0 bow of i: 18.0	tail of i: 24.0	gama_i0: 17.0 gama_i1
V_id: 82 : 18.0	gama_i1 + 1: 19.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 5.0	xi: 19.5 bow of i: 17.0	tail of i: 22.0	gama_i0: 36.0 gama_i1
V_id: 83 : 38.0	gama_i1 + 1: 39.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	demand_i: 120.0 work	
load_i: 120.0	work load gap_i: 0	li: 9.0	xi: 13.5 bow of i: 9.0	tail of i: 18.0	gama_i0: 15.0 gama_i1
V_id: 84 : 16.0	gama_i1 + 1: 17.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 80.0 work	
load_i: 80.0	work load gap_i: 0	li: 9.0	xi: 4.5 bow of i: 0.0	tail of i: 9.0	gama_i0: 17.0 gama_i1
V_id: 85 : 0	gama_i1 + 1: 19.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	demand_i: 60.0 work	
load_i: 60.0	work load gap_i: 0	li: 6.0	xi: 3.0 bow of i: 0.0	tail of i: 6.0	gama_i0: 33.0 gama_i1
V_id: 86					36. work

unknown

495	0	gama_i1 + 1: 37.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	demand_i: 160.0	work
496		load_i: 160.0 V_id: 87	work load gap_i: 0 li: 5.0	xi: 9.5 bow of i: 7.0	tail of i: 12.0	gama_i0: 11.0 demand_i: 160.0
	13.0	gama_i1 + 1: 14.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	gama_i1:	work
497		load_i: 160.0 V_id: 88	work load gap_i: 0 li: 8.0	xi: 14.0 bow of i: 10.0	tail of i: 18.0	gama_i0: 34.0 demand_i: 100.0
	: 35.0	gama_i1 + 1: 36.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	work
498		load_i: 100.0 V_id: 89	work load gap_i: 0 li: 9.0	xi: 4.5 bow of i: 0.0	tail of i: 9.0	gama_i0: 39.0 demand_i: 160.0
	0	gama_i1 + 1: 42.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	gama_i1:	41. work
499		load_i: 160.0 V_id: 90	work load gap_i: 0 li: 4.0	xi: 21.0 bow of i: 19.0	tail of i: 23.0	gama_i0: 12.0 demand_i: 100.0
	: 14.0	gama_i1 + 1: 15.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	gama_i1:	work
500		load_i: 100.0 V_id: 91	work load gap_i: 0 li: 5.0	xi: 2.5 bow of i: 0.0	tail of i: 5.0	gama_i0: 7.0 demand_i: 120.0
	0	gama_i1 + 1: 10.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	gama_i1:	9.0 work
501		load_i: 120.0 V_id: 92	work load gap_i: 0 li: 5.0	xi: 2.5 bow of i: 0.0	tail of i: 5.0	gama_i0: 44.0 demand_i: 120.0
	0	gama_i1 + 1: 46.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	45. work
502		load_i: 120.0 V_id: 93	work load gap_i: 0 li: 7.0	xi: 19.5 bow of i: 16.0	tail of i: 23.0	gama_i0: 21.0 demand_i: 140.0
	: 24.0	gama_i1 + 1: 25.0	gama_i1 - gama_i0: 3.0	duration_time_i: 4.0	gama_i1:	work
503		load_i: 140.0 V_id: 94	work load gap_i: 0 li: 5.0	xi: 9.5 bow of i: 7.0	tail of i: 12.0	gama_i0: 43.0 demand_i: 120.0
	44.0	gama_i1 + 1: 45.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	work
504		load_i: 120.0 V_id: 95	work load gap_i: 0 li: 6.0	xi: 8.0 bow of i: 5.0	tail of i: 11.0	gama_i0: 9.0 demand_i: 80.0
	10.0	gama_i1 + 1: 11.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	work
505		load_i: 80.0 V_id: 96	work load gap_i: 0 li: 8.0	xi: 21.0 bow of i: 17.0	tail of i: 25.0	gama_i0: 43.0 demand_i: 80.0
	: 44.0	gama_i1 + 1: 45.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	work
506		load_i: 80.0 V_id: 97	work load gap_i: 0 li: 4.0	xi: 27.0 bow of i: 25.0	tail of i: 29.0	gama_i0: 43.0 demand_i: 100.0
	: 44.0	gama_i1 + 1: 45.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	work
507		load_i: 100.0 V_id: 98	work load gap_i: 0 li: 7.0	xi: 3.5 bow of i: 0.0	tail of i: 7.0	gama_i0: 55.0 demand_i: 80.0
	0	gama_i1 + 1: 57.0	gama_i1 - gama_i0: 1.0	duration_time_i: 2.0	gama_i1:	56. work
508		load_i: 80.0 V_id: 99	work load gap_i: 0 li: 9.0	xi: 13.5 bow of i: 9.0	tail of i: 18.0	gama_i0: 17.0 demand_i: 160.0
	: 19.0	gama_i1 + 1: 20.0	gama_i1 - gama_i0: 2.0	duration_time_i: 3.0	gama_i1:	work
509		load_i: 160.0	work load gap_i: 0			

510 Algorithm finished and the total CPU time: 3816 s

511 End

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