

unknown

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80 cord_individual_obj[indivial_i, :] = [16. 6. 50. 56.]
81 cord_individual_obj[indivial_i, :] = [17. 7. 49. 56.]
82 cord_individual_obj[indivial_i, :] = [18. 6. 37. 43.]
83 cord_individual_obj[indivial_i, :] = [19. 6. 52. 58.]
84 cord_individual_obj[indivial_i, :] = [20. 5. 32. 37.]
85 cord_individual_obj[indivial_i, :] = [21. 7. 21. 28.]
86 cord_individual_obj[indivial_i, :] = [22. 6. 45. 51.]
87 cord_individual_obj[indivial_i, :] = [23. 5. 31. 36.]
88 cord_individual_obj[indivial_i, :] = [24. 6. 22. 28.]
89
90 min(cord_individual_obj[:, 3]) = 28.0
91 historl_G_best_iter[iter, 3] = 28.0
92 Begin iteration:
93
94 iter = 2
95 cord_individual_obj[indivial_i, :] = [ 0. 7. 23. 30.]
96 cord_individual_obj[indivial_i, :] = [ 1. 5. 51. 56.]
97 cord_individual_obj[indivial_i, :] = [ 2. 6. 75. 81.]
98 cord_individual_obj[indivial_i, :] = [ 3. 6. 39. 45.]
99 cord_individual_obj[indivial_i, :] = [ 4. 5. 59. 64.]
100 cord_individual_obj[indivial_i, :] = [ 5. 6. 24. 30.]
101 cord_individual_obj[indivial_i, :] = [ 6. 5. 52. 57.]
102 cord_individual_obj[indivial_i, :] = [ 7. 5. 23. 28.]
103 cord_individual_obj[indivial_i, :] = [ 8. 6. 42. 48.]
104 cord_individual_obj[indivial_i, :] = [ 9. 7. 34. 41.]
105 cord_individual_obj[indivial_i, :] = [10. 6. 41. 47.]
106 cord_individual_obj[indivial_i, :] = [11. 5. 71. 76.]
107 cord_individual_obj[indivial_i, :] = [12. 5. 30. 35.]
108 cord_individual_obj[indivial_i, :] = [13. 6. 57. 63.]
109 cord_individual_obj[indivial_i, :] = [14. 7. 49. 56.]
110 cord_individual_obj[indivial_i, :] = [15. 6. 41. 47.]
111 cord_individual_obj[indivial_i, :] = [16. 7. 79. 86.]
112 cord_individual_obj[indivial_i, :] = [17. 6. 49. 55.]
113 cord_individual_obj[indivial_i, :] = [18. 6. 42. 48.]
114 cord_individual_obj[indivial_i, :] = [19. 6. 65. 71.]
115 cord_individual_obj[indivial_i, :] = [20. 6. 21. 27.]
116 cord_individual_obj[indivial_i, :] = [21. 6. 23. 29.]
117 cord_individual_obj[indivial_i, :] = [22. 6. 22. 28.]
118 cord_individual_obj[indivial_i, :] = [23. 4. 69. 73.]
119 cord_individual_obj[indivial_i, :] = [24. 6. 64. 70.]
120
121 min(cord_individual_obj[:, 3]) = 27.0
122 historl_G_best_iter[iter, 3] = 27.0
123 Begin iteration:
124
125 iter = 3
126 cord_individual_obj[indivial_i, :] = [ 0. 5. 43. 48.]
127 cord_individual_obj[indivial_i, :] = [ 1. 6. 36. 42.]
128 cord_individual_obj[indivial_i, :] = [ 2. 8. 53. 61.]
129 cord_individual_obj[indivial_i, :] = [ 3. 7. 52. 59.]
130 cord_individual_obj[indivial_i, :] = [ 4. 6. 50. 56.]
131 cord_individual_obj[indivial_i, :] = [ 5. 7. 33. 40.]
132 cord_individual_obj[indivial_i, :] = [ 6. 8. 52. 60.]
133 cord_individual_obj[indivial_i, :] = [ 7. 6. 54. 60.]
134 cord_individual_obj[indivial_i, :] = [ 8. 8. 50. 58.]
135 cord_individual_obj[indivial_i, :] = [ 9. 7. 50. 57.]
136 cord_individual_obj[indivial_i, :] = [10. 7. 51. 58.]
137 cord_individual_obj[indivial_i, :] = [11. 7. 58. 65.]
138 cord_individual_obj[indivial_i, :] = [12. 6. 71. 77.]
139 cord_individual_obj[indivial_i, :] = [13. 7. 27. 34.]
140 cord_individual_obj[indivial_i, :] = [14. 7. 30. 37.]
141 cord_individual_obj[indivial_i, :] = [15. 5. 50. 55.]
142 cord_individual_obj[indivial_i, :] = [16. 6. 21. 27.]
143 cord_individual_obj[indivial_i, :] = [17. 6. 53. 59.]
144 cord_individual_obj[indivial_i, :] = [18. 4. 47. 51.]
145 cord_individual_obj[indivial_i, :] = [19. 6. 37. 43.]
146 cord_individual_obj[indivial_i, :] = [20. 7. 40. 47.]
147 cord_individual_obj[indivial_i, :] = [21. 6. 39. 45.]
148 cord_individual_obj[indivial_i, :] = [22. 7. 31. 38.]
149 cord_individual_obj[indivial_i, :] = [23. 8. 53. 61.]
150 cord_individual_obj[indivial_i, :] = [24. 6. 47. 53.]
151
152 min(cord_individual_obj[:, 3]) = 27.0
153 historl_G_best_iter[iter, 3] = 27.0
154 Begin iteration:
155
156 iter = 4
157 cord_individual_obj[indivial_i, :] = [ 0. 7. 36. 43.]
158 cord_individual_obj[indivial_i, :] = [ 1. 6. 34. 40.]
159 cord_individual_obj[indivial_i, :] = [ 2. 6. 67. 73.]
160 cord_individual_obj[indivial_i, :] = [ 3. 6. 86. 92.]
161 cord_individual_obj[indivial_i, :] = [ 4. 8. 101. 109.]
162 cord_individual_obj[indivial_i, :] = [ 5. 8. 38. 46.]
163 cord_individual_obj[indivial_i, :] = [ 6. 6. 54. 60.]

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164 cord_individual_obj[indivial_i,:] = [ 7. 6. 25. 31.]
165 cord_individual_obj[indivial_i,:] = [ 8. 8. 40. 48.]
166 cord_individual_obj[indivial_i,:] = [ 9. 6. 35. 41.]
167 cord_individual_obj[indivial_i,:] = [10. 6. 47. 53.]
168 cord_individual_obj[indivial_i,:] = [11. 6. 75. 81.]
169 cord_individual_obj[indivial_i,:] = [12. 6. 21. 27.]
170 cord_individual_obj[indivial_i,:] = [13. 7. 46. 53.]
171 cord_individual_obj[indivial_i,:] = [14. 7. 36. 43.]
172 cord_individual_obj[indivial_i,:] = [15. 6. 29. 35.]
173 cord_individual_obj[indivial_i,:] = [16. 6. 53. 59.]
174 cord_individual_obj[indivial_i,:] = [17. 6. 33. 39.]
175 cord_individual_obj[indivial_i,:] = [18. 8. 49. 57.]
176 cord_individual_obj[indivial_i,:] = [19. 8. 33. 41.]
177 cord_individual_obj[indivial_i,:] = [20. 7. 74. 81.]
178 cord_individual_obj[indivial_i,:] = [21. 7. 43. 50.]
179 cord_individual_obj[indivial_i,:] = [22. 6. 74. 80.]
180 cord_individual_obj[indivial_i,:] = [23. 7. 57. 64.]
181 cord_individual_obj[indivial_i,:] = [24. 6. 24. 30.]
182
183 min(cord_individual_obj[:,3]) = 27.0
184 historl_G_best_iter[iter,3] = 27.0
185 Begin iteration:
186
187 iter = 5
188 cord_individual_obj[indivial_i,:] = [ 0. 6. 97. 103.]
189 cord_individual_obj[indivial_i,:] = [ 1. 6. 46. 52.]
190 cord_individual_obj[indivial_i,:] = [ 2. 8. 35. 43.]
191 cord_individual_obj[indivial_i,:] = [ 3. 7. 110. 117.]
192 cord_individual_obj[indivial_i,:] = [ 4. 6. 21. 27.]
193 cord_individual_obj[indivial_i,:] = [ 5. 6. 58. 64.]
194 cord_individual_obj[indivial_i,:] = [ 6. 6. 27. 33.]
195 cord_individual_obj[indivial_i,:] = [ 7. 6. 33. 39.]
196 cord_individual_obj[indivial_i,:] = [ 8. 8. 124. 132.]
197 cord_individual_obj[indivial_i,:] = [ 9. 5. 77. 82.]
198 cord_individual_obj[indivial_i,:] = [10. 6. 26. 32.]
199 cord_individual_obj[indivial_i,:] = [11. 6. 57. 63.]
200 cord_individual_obj[indivial_i,:] = [12. 7. 37. 44.]
201 cord_individual_obj[indivial_i,:] = [13. 7. 26. 33.]
202 cord_individual_obj[indivial_i,:] = [14. 7. 49. 56.]
203 cord_individual_obj[indivial_i,:] = [15. 5. 78. 83.]
204 cord_individual_obj[indivial_i,:] = [16. 8. 40. 48.]
205 cord_individual_obj[indivial_i,:] = [17. 6. 60. 66.]
206 cord_individual_obj[indivial_i,:] = [18. 6. 33. 39.]
207 cord_individual_obj[indivial_i,:] = [19. 7. 44. 51.]
208 cord_individual_obj[indivial_i,:] = [20. 5. 67. 72.]
209 cord_individual_obj[indivial_i,:] = [21. 6. 51. 57.]
210 cord_individual_obj[indivial_i,:] = [22. 6. 24. 30.]
211 cord_individual_obj[indivial_i,:] = [23. 8. 36. 44.]
212 cord_individual_obj[indivial_i,:] = [24. 8. 36. 44.]
213
214 min(cord_individual_obj[:,3]) = 27.0
215 historl_G_best_iter[iter,3] = 27.0
216 Begin iteration:
217
218 iter = 6
219 cord_individual_obj[indivial_i,:] = [ 0. 7. 47. 54.]
220 cord_individual_obj[indivial_i,:] = [ 1. 5. 68. 73.]
221 cord_individual_obj[indivial_i,:] = [ 2. 6. 32. 38.]
222 cord_individual_obj[indivial_i,:] = [ 3. 6. 78. 84.]
223 cord_individual_obj[indivial_i,:] = [ 4. 6. 51. 57.]
224 cord_individual_obj[indivial_i,:] = [ 5. 7. 52. 59.]
225 cord_individual_obj[indivial_i,:] = [ 6. 8. 37. 45.]
226 cord_individual_obj[indivial_i,:] = [ 7. 7. 44. 51.]
227 cord_individual_obj[indivial_i,:] = [ 8. 6. 21. 27.]
228 cord_individual_obj[indivial_i,:] = [ 9. 6. 46. 52.]
229 cord_individual_obj[indivial_i,:] = [10. 5. 58. 63.]
230 cord_individual_obj[indivial_i,:] = [11. 6. 68. 74.]
231 cord_individual_obj[indivial_i,:] = [12. 6. 42. 48.]
232 cord_individual_obj[indivial_i,:] = [13. 6. 52. 58.]
233 cord_individual_obj[indivial_i,:] = [14. 6. 45. 51.]
234 cord_individual_obj[indivial_i,:] = [15. 6. 46. 52.]
235 cord_individual_obj[indivial_i,:] = [16. 7. 29. 36.]
236 cord_individual_obj[indivial_i,:] = [17. 7. 23. 30.]
237 cord_individual_obj[indivial_i,:] = [18. 6. 48. 54.]
238 cord_individual_obj[indivial_i,:] = [19. 7. 76. 83.]
239 cord_individual_obj[indivial_i,:] = [20. 6. 51. 57.]
240 cord_individual_obj[indivial_i,:] = [21. 6. 93. 99.]
241 cord_individual_obj[indivial_i,:] = [22. 6. 35. 41.]
242 cord_individual_obj[indivial_i,:] = [23. 8. 56. 64.]
243 cord_individual_obj[indivial_i,:] = [24. 7. 23. 30.]
244
245 min(cord_individual_obj[:,3]) = 27.0
246 historl_G_best_iter[iter,3] = 27.0
247 Begin iteration:

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248
249 iter = 7
250 cord_individual_obj[indivial_i, :] = [ 0.  6. 77. 83.]
251 cord_individual_obj[indivial_i, :] = [ 1.  7. 22. 29.]
252 cord_individual_obj[indivial_i, :] = [ 2.  6. 28. 34.]
253 cord_individual_obj[indivial_i, :] = [ 3.  6. 50. 56.]
254 cord_individual_obj[indivial_i, :] = [ 4.  8. 33. 41.]
255 cord_individual_obj[indivial_i, :] = [ 5.  6. 59. 65.]
256 cord_individual_obj[indivial_i, :] = [ 6.  6. 91. 97.]
257 cord_individual_obj[indivial_i, :] = [ 7.  6. 51. 57.]
258 cord_individual_obj[indivial_i, :] = [ 8.  7. 52. 59.]
259 cord_individual_obj[indivial_i, :] = [ 9.  7. 63. 70.]
260 cord_individual_obj[indivial_i, :] = [10. 7. 45. 52.]
261 cord_individual_obj[indivial_i, :] = [11. 5. 46. 51.]
262 cord_individual_obj[indivial_i, :] = [12. 6. 55. 61.]
263 cord_individual_obj[indivial_i, :] = [13. 6. 54. 60.]
264 cord_individual_obj[indivial_i, :] = [14. 7. 29. 36.]
265 cord_individual_obj[indivial_i, :] = [15. 5. 22. 27.]
266 cord_individual_obj[indivial_i, :] = [16. 7. 36. 43.]
267 cord_individual_obj[indivial_i, :] = [17. 5. 66. 71.]
268 cord_individual_obj[indivial_i, :] = [18. 7. 53. 60.]
269 cord_individual_obj[indivial_i, :] = [19. 7. 47. 54.]
270 cord_individual_obj[indivial_i, :] = [20. 8. 47. 55.]
271 cord_individual_obj[indivial_i, :] = [21. 6. 21. 27.]
272 cord_individual_obj[indivial_i, :] = [22. 7. 66. 73.]
273 cord_individual_obj[indivial_i, :] = [23. 7. 44. 51.]
274 cord_individual_obj[indivial_i, :] = [24. 7. 58. 65.]
275

276 min(cord_individual_obj[:, 3]) = 27.0
277 historl_G_best_iter[iter, 3] = 27.0
278 Begin iteration:
279
280 iter = 8
281 cord_individual_obj[indivial_i, :] = [ 0.  5. 84. 89.]
282 cord_individual_obj[indivial_i, :] = [ 1.  7. 39. 46.]
283 cord_individual_obj[indivial_i, :] = [ 2.  6. 84. 90.]
284 cord_individual_obj[indivial_i, :] = [ 3.  6. 66. 72.]
285 cord_individual_obj[indivial_i, :] = [ 4.  6. 52. 58.]
286 cord_individual_obj[indivial_i, :] = [ 5.  7. 30. 37.]
287 cord_individual_obj[indivial_i, :] = [ 6.  5. 22. 27.]
288 cord_individual_obj[indivial_i, :] = [ 7.  7. 73. 80.]
289 cord_individual_obj[indivial_i, :] = [ 8.  8. 48. 56.]
290 cord_individual_obj[indivial_i, :] = [ 9.  7. 44. 51.]
291 cord_individual_obj[indivial_i, :] = [10. 6. 31. 37.]
292 cord_individual_obj[indivial_i, :] = [11. 5. 27. 32.]
293 cord_individual_obj[indivial_i, :] = [12. 6. 95. 101.]
294 cord_individual_obj[indivial_i, :] = [13. 7. 51. 58.]
295 cord_individual_obj[indivial_i, :] = [14. 6. 64. 70.]
296 cord_individual_obj[indivial_i, :] = [15. 7. 37. 44.]
297 cord_individual_obj[indivial_i, :] = [16. 6. 81. 87.]
298 cord_individual_obj[indivial_i, :] = [17. 7. 44. 51.]
299 cord_individual_obj[indivial_i, :] = [18. 7. 34. 41.]
300 cord_individual_obj[indivial_i, :] = [19. 7. 34. 41.]
301 cord_individual_obj[indivial_i, :] = [20. 8. 28. 36.]
302 cord_individual_obj[indivial_i, :] = [21. 6. 53. 59.]
303 cord_individual_obj[indivial_i, :] = [22. 7. 43. 50.]
304 cord_individual_obj[indivial_i, :] = [23. 6. 33. 39.]
305 cord_individual_obj[indivial_i, :] = [24. 8. 54. 62.]
306

307 min(cord_individual_obj[:, 3]) = 27.0
308 historl_G_best_iter[iter, 3] = 27.0
309 Begin iteration:
310
311 iter = 9
312 cord_individual_obj[indivial_i, :] = [ 0.  8. 26. 34.]
313 cord_individual_obj[indivial_i, :] = [ 1.  7. 69. 76.]
314 cord_individual_obj[indivial_i, :] = [ 2.  8. 78. 86.]
315 cord_individual_obj[indivial_i, :] = [ 3.  5. 35. 40.]
316 cord_individual_obj[indivial_i, :] = [ 4.  5. 68. 73.]
317 cord_individual_obj[indivial_i, :] = [ 5.  7. 54. 61.]
318 cord_individual_obj[indivial_i, :] = [ 6.  5. 67. 72.]
319 cord_individual_obj[indivial_i, :] = [ 7.  8. 60. 68.]
320 cord_individual_obj[indivial_i, :] = [ 8.  7. 41. 48.]
321 cord_individual_obj[indivial_i, :] = [ 9.  7. 40. 47.]
322 cord_individual_obj[indivial_i, :] = [10. 6. 25. 31.]
323 cord_individual_obj[indivial_i, :] = [11. 6. 49. 55.]
324 cord_individual_obj[indivial_i, :] = [12. 5. 22. 27.]
325 cord_individual_obj[indivial_i, :] = [13. 8. 98. 106.]
326 cord_individual_obj[indivial_i, :] = [14. 9. 42. 51.]
327 cord_individual_obj[indivial_i, :] = [15. 8. 44. 52.]
328 cord_individual_obj[indivial_i, :] = [16. 6. 44. 50.]
329 cord_individual_obj[indivial_i, :] = [17. 7. 38. 45.]
330 cord_individual_obj[indivial_i, :] = [18. 6. 30. 36.]
331 cord_individual_obj[indivial_i, :] = [19. 7. 35. 42.]

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332 cord_individual_obj[indivial_i,:] = [20. 7. 21. 28.]
333 cord_individual_obj[indivial_i,:] = [21. 5. 27. 32.]
334 cord_individual_obj[indivial_i,:] = [22. 7. 32. 39.]
335 cord_individual_obj[indivial_i,:] = [23. 8. 41. 49.]
336 cord_individual_obj[indivial_i,:] = [24. 7. 53. 60.]
337
338 min(cord_individual_obj[:,3]) = 27.0
339 historl_G_best_iter[iter,3] = 27.0
340 Begin iteration:
341
342 iter = 10
343 cord_individual_obj[indivial_i,:] = [ 0. 7. 29. 36.]
344 cord_individual_obj[indivial_i,:] = [ 1. 7. 25. 32.]
345 cord_individual_obj[indivial_i,:] = [ 2. 8. 38. 46.]
346 cord_individual_obj[indivial_i,:] = [ 3. 7. 42. 49.]
347 cord_individual_obj[indivial_i,:] = [ 4. 6. 37. 43.]
348 cord_individual_obj[indivial_i,:] = [ 5. 6. 30. 36.]
349 cord_individual_obj[indivial_i,:] = [ 6. 5. 67. 72.]
350 cord_individual_obj[indivial_i,:] = [ 7. 8. 56. 64.]
351 cord_individual_obj[indivial_i,:] = [ 8. 6. 44. 50.]
352 cord_individual_obj[indivial_i,:] = [ 9. 6. 54. 60.]
353 cord_individual_obj[indivial_i,:] = [10. 6. 39. 45.]
354 cord_individual_obj[indivial_i,:] = [11. 6. 47. 53.]
355 cord_individual_obj[indivial_i,:] = [12. 6. 78. 84.]
356 cord_individual_obj[indivial_i,:] = [13. 5. 22. 27.]
357 cord_individual_obj[indivial_i,:] = [14. 7. 44. 51.]
358 cord_individual_obj[indivial_i,:] = [15. 7. 61. 68.]
359 cord_individual_obj[indivial_i,:] = [16. 6. 44. 50.]
360 cord_individual_obj[indivial_i,:] = [17. 7. 51. 58.]
361 cord_individual_obj[indivial_i,:] = [18. 6. 66. 72.]
362 cord_individual_obj[indivial_i,:] = [19. 6. 57. 63.]
363 cord_individual_obj[indivial_i,:] = [20. 7. 64. 71.]
364 cord_individual_obj[indivial_i,:] = [21. 6. 58. 64.]
365 cord_individual_obj[indivial_i,:] = [22. 5. 51. 56.]
366 cord_individual_obj[indivial_i,:] = [23. 7. 28. 35.]
367 cord_individual_obj[indivial_i,:] = [24. 7. 55. 62.]
368
369 min(cord_individual_obj[:,3]) = 27.0
370 historl_G_best_iter[iter,3] = 27.0
371 Begin iteration:
372
373 iter = 11
374 cord_individual_obj[indivial_i,:] = [ 0. 5. 55. 60.]
375 cord_individual_obj[indivial_i,:] = [ 1. 6. 23. 29.]
376 cord_individual_obj[indivial_i,:] = [ 2. 7. 49. 56.]
377 cord_individual_obj[indivial_i,:] = [ 3. 5. 86. 91.]
378 cord_individual_obj[indivial_i,:] = [ 4. 7. 40. 47.]
379 cord_individual_obj[indivial_i,:] = [ 5. 7. 39. 46.]
380 cord_individual_obj[indivial_i,:] = [ 6. 6. 46. 52.]
381 cord_individual_obj[indivial_i,:] = [ 7. 6. 60. 66.]
382 cord_individual_obj[indivial_i,:] = [ 8. 7. 23. 30.]
383 cord_individual_obj[indivial_i,:] = [ 9. 6. 58. 64.]
384 cord_individual_obj[indivial_i,:] = [10. 6. 39. 45.]
385 cord_individual_obj[indivial_i,:] = [11. 6. 42. 48.]
386 cord_individual_obj[indivial_i,:] = [12. 5. 22. 27.]
387 cord_individual_obj[indivial_i,:] = [13. 8. 79. 87.]
388 cord_individual_obj[indivial_i,:] = [14. 6. 65. 71.]
389 cord_individual_obj[indivial_i,:] = [15. 6. 52. 58.]
390 cord_individual_obj[indivial_i,:] = [16. 6. 50. 56.]
391 cord_individual_obj[indivial_i,:] = [17. 5. 42. 47.]
392 cord_individual_obj[indivial_i,:] = [18. 5. 45. 50.]
393 cord_individual_obj[indivial_i,:] = [19. 6. 22. 28.]
394 cord_individual_obj[indivial_i,:] = [20. 7. 55. 62.]
395 cord_individual_obj[indivial_i,:] = [21. 5. 54. 59.]
396 cord_individual_obj[indivial_i,:] = [22. 6. 51. 57.]
397 cord_individual_obj[indivial_i,:] = [23. 8. 46. 54.]
398 cord_individual_obj[indivial_i,:] = [24. 7. 58. 65.]
399
400 min(cord_individual_obj[:,3]) = 27.0
401 historl_G_best_iter[iter,3] = 27.0
402 Begin iteration:
403
404 iter = 12
405 cord_individual_obj[indivial_i,:] = [ 0. 8. 40. 48.]
406 cord_individual_obj[indivial_i,:] = [ 1. 7. 53. 60.]
407 cord_individual_obj[indivial_i,:] = [ 2. 9. 61. 70.]
408 cord_individual_obj[indivial_i,:] = [ 3. 5. 22. 27.]
409 cord_individual_obj[indivial_i,:] = [ 4. 6. 42. 48.]
410 cord_individual_obj[indivial_i,:] = [ 5. 7. 52. 59.]
411 cord_individual_obj[indivial_i,:] = [ 6. 7. 33. 40.]
412 cord_individual_obj[indivial_i,:] = [ 7. 7. 52. 59.]
413 cord_individual_obj[indivial_i,:] = [ 8. 7. 69. 76.]
414 cord_individual_obj[indivial_i,:] = [ 9. 6. 38. 44.]
415 cord_individual_obj[indivial_i,:] = [10. 7. 27. 34.]

```

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416 cord_individual_obj[indivial_i,:] = [11. 6. 49. 55.]
417 cord_individual_obj[indivial_i,:] = [12. 5. 78. 83.]
418 cord_individual_obj[indivial_i,:] = [13. 6. 55. 61.]
419 cord_individual_obj[indivial_i,:] = [14. 5. 39. 44.]
420 cord_individual_obj[indivial_i,:] = [15. 6. 58. 64.]
421 cord_individual_obj[indivial_i,:] = [16. 6. 48. 54.]
422 cord_individual_obj[indivial_i,:] = [17. 7. 55. 62.]
423 cord_individual_obj[indivial_i,:] = [18. 6. 37. 43.]
424 cord_individual_obj[indivial_i,:] = [19. 6. 57. 63.]
425 cord_individual_obj[indivial_i,:] = [20. 7. 67. 74.]
426 cord_individual_obj[indivial_i,:] = [21. 6. 33. 39.]
427 cord_individual_obj[indivial_i,:] = [22. 7. 59. 66.]
428 cord_individual_obj[indivial_i,:] = [23. 7. 60. 67.]
429 cord_individual_obj[indivial_i,:] = [24. 7. 39. 46.]
430
431 min(cord_individual_obj[:,3]) = 27.0
432 histol_G_best_iter[iter,3] = 27.0
433 Begin iteration:
434
435 iter = 13
436 cord_individual_obj[indivial_i,:] = [ 0. 8. 59. 67.]
437 cord_individual_obj[indivial_i,:] = [ 1. 7. 25. 32.]
438 cord_individual_obj[indivial_i,:] = [ 2. 8. 36. 44.]
439 cord_individual_obj[indivial_i,:] = [ 3. 7. 42. 49.]
440 cord_individual_obj[indivial_i,:] = [ 4. 8. 42. 50.]
441 cord_individual_obj[indivial_i,:] = [ 5. 7. 23. 30.]
442 cord_individual_obj[indivial_i,:] = [ 6. 5. 67. 72.]
443 cord_individual_obj[indivial_i,:] = [ 7. 8. 62. 70.]
444 cord_individual_obj[indivial_i,:] = [ 8. 7. 43. 50.]
445 cord_individual_obj[indivial_i,:] = [ 9. 6. 46. 52.]
446 cord_individual_obj[indivial_i,:] = [10. 6. 41. 47.]
447 cord_individual_obj[indivial_i,:] = [11. 8. 41. 49.]
448 cord_individual_obj[indivial_i,:] = [12. 5. 22. 27.]
449 cord_individual_obj[indivial_i,:] = [13. 8. 79. 87.]
450 cord_individual_obj[indivial_i,:] = [14. 7. 44. 51.]
451 cord_individual_obj[indivial_i,:] = [15. 7. 24. 31.]
452 cord_individual_obj[indivial_i,:] = [16. 6. 44. 50.]
453 cord_individual_obj[indivial_i,:] = [17. 7. 51. 58.]
454 cord_individual_obj[indivial_i,:] = [18. 6. 64. 70.]
455 cord_individual_obj[indivial_i,:] = [19. 6. 57. 63.]
456 cord_individual_obj[indivial_i,:] = [20. 7. 75. 82.]
457 cord_individual_obj[indivial_i,:] = [21. 5. 29. 34.]
458 cord_individual_obj[indivial_i,:] = [22. 6. 67. 73.]
459 cord_individual_obj[indivial_i,:] = [23. 6. 28. 34.]
460 cord_individual_obj[indivial_i,:] = [24. 7. 55. 62.]
461
462 min(cord_individual_obj[:,3]) = 27.0
463 histol_G_best_iter[iter,3] = 27.0
464 Begin iteration:
465
466 iter = 14
467 cord_individual_obj[indivial_i,:] = [ 0. 6. 48. 54.]
468 cord_individual_obj[indivial_i,:] = [ 1. 7. 21. 28.]
469 cord_individual_obj[indivial_i,:] = [ 2. 6. 16. 22.]
470 cord_individual_obj[indivial_i,:] = [ 3. 5. 92. 97.]
471 cord_individual_obj[indivial_i,:] = [ 4. 5. 26. 31.]
472 cord_individual_obj[indivial_i,:] = [ 5. 5. 38. 43.]
473 cord_individual_obj[indivial_i,:] = [ 6. 5. 25. 30.]
474 cord_individual_obj[indivial_i,:] = [ 7. 5. 46. 51.]
475 cord_individual_obj[indivial_i,:] = [ 8. 7. 67. 74.]
476 cord_individual_obj[indivial_i,:] = [ 9. 5. 46. 51.]
477 cord_individual_obj[indivial_i,:] = [10. 7. 43. 50.]
478 cord_individual_obj[indivial_i,:] = [11. 6. 44. 50.]
479 cord_individual_obj[indivial_i,:] = [12. 6. 78. 84.]
480 cord_individual_obj[indivial_i,:] = [13. 5. 22. 27.]
481 cord_individual_obj[indivial_i,:] = [14. 6. 25. 31.]
482 cord_individual_obj[indivial_i,:] = [15. 7. 52. 59.]
483 cord_individual_obj[indivial_i,:] = [16. 5. 68. 73.]
484 cord_individual_obj[indivial_i,:] = [17. 6. 50. 56.]
485 cord_individual_obj[indivial_i,:] = [18. 7. 53. 60.]
486 cord_individual_obj[indivial_i,:] = [19. 6. 45. 51.]
487 cord_individual_obj[indivial_i,:] = [20. 6. 26. 32.]
488 cord_individual_obj[indivial_i,:] = [21. 5. 50. 55.]
489 cord_individual_obj[indivial_i,:] = [22. 7. 39. 46.]
490 cord_individual_obj[indivial_i,:] = [23. 6. 23. 29.]
491 cord_individual_obj[indivial_i,:] = [24. 7. 59. 66.]
492
493 min(cord_individual_obj[:,3]) = 22.0
494 histol_G_best_iter[iter,3] = 22.0
495 Begin iteration:
496
497 iter = 15
498 cord_individual_obj[indivial_i,:] = [ 0. 6. 36. 42.]
499 cord_individual_obj[indivial_i,:] = [ 1. 6. 24. 30.]

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500 cord_individual_obj[indivial_i,:] = [ 2. 7. 39. 46.]
501 cord_individual_obj[indivial_i,:] = [ 3. 6. 16. 22.]
502 cord_individual_obj[indivial_i,:] = [ 4. 7. 48. 55.]
503 cord_individual_obj[indivial_i,:] = [ 5. 6. 86. 92.]
504 cord_individual_obj[indivial_i,:] = [ 6. 5. 34. 39.]
505 cord_individual_obj[indivial_i,:] = [ 7. 6. 48. 54.]
506 cord_individual_obj[indivial_i,:] = [ 8. 6. 51. 57.]
507 cord_individual_obj[indivial_i,:] = [ 9. 6. 45. 51.]
508 cord_individual_obj[indivial_i,:] = [10. 6. 20. 26.]
509 cord_individual_obj[indivial_i,:] = [11. 5. 45. 50.]
510 cord_individual_obj[indivial_i,:] = [12. 7. 56. 63.]
511 cord_individual_obj[indivial_i,:] = [13. 7. 62. 69.]
512 cord_individual_obj[indivial_i,:] = [14. 6. 25. 31.]
513 cord_individual_obj[indivial_i,:] = [15. 6. 38. 44.]
514 cord_individual_obj[indivial_i,:] = [16. 5. 50. 55.]
515 cord_individual_obj[indivial_i,:] = [17. 7. 49. 56.]
516 cord_individual_obj[indivial_i,:] = [18. 5. 43. 48.]
517 cord_individual_obj[indivial_i,:] = [19. 7. 49. 56.]
518 cord_individual_obj[indivial_i,:] = [20. 6. 30. 36.]
519 cord_individual_obj[indivial_i,:] = [21. 6. 55. 61.]
520 cord_individual_obj[indivial_i,:] = [22. 6. 25. 31.]
521 cord_individual_obj[indivial_i,:] = [23. 6. 50. 56.]
522 cord_individual_obj[indivial_i,:] = [24. 6. 44. 50.]
523
524 min(cord_individual_obj[:,3]) = 22.0
525 histol_G_best_iter[iter,3] = 22.0
526 Begin iteration:
527
528 iter = 16
529 cord_individual_obj[indivial_i,:] = [ 0. 6. 62. 68.]
530 cord_individual_obj[indivial_i,:] = [ 1. 7. 26. 33.]
531 cord_individual_obj[indivial_i,:] = [ 2. 6. 40. 46.]
532 cord_individual_obj[indivial_i,:] = [ 3. 6. 58. 64.]
533 cord_individual_obj[indivial_i,:] = [ 4. 6. 48. 54.]
534 cord_individual_obj[indivial_i,:] = [ 5. 6. 16. 22.]
535 cord_individual_obj[indivial_i,:] = [ 6. 6. 55. 61.]
536 cord_individual_obj[indivial_i,:] = [ 7. 8. 38. 46.]
537 cord_individual_obj[indivial_i,:] = [ 8. 7. 51. 58.]
538 cord_individual_obj[indivial_i,:] = [ 9. 6. 45. 51.]
539 cord_individual_obj[indivial_i,:] = [10. 5. 48. 53.]
540 cord_individual_obj[indivial_i,:] = [11. 5. 42. 47.]
541 cord_individual_obj[indivial_i,:] = [12. 6. 29. 35.]
542 cord_individual_obj[indivial_i,:] = [13. 7. 24. 31.]
543 cord_individual_obj[indivial_i,:] = [14. 7. 30. 37.]
544 cord_individual_obj[indivial_i,:] = [15. 6. 62. 68.]
545 cord_individual_obj[indivial_i,:] = [16. 5. 36. 41.]
546 cord_individual_obj[indivial_i,:] = [17. 6. 50. 56.]
547 cord_individual_obj[indivial_i,:] = [18. 5. 49. 54.]
548 cord_individual_obj[indivial_i,:] = [19. 6. 41. 47.]
549 cord_individual_obj[indivial_i,:] = [20. 6. 48. 54.]
550 cord_individual_obj[indivial_i,:] = [21. 6. 27. 33.]
551 cord_individual_obj[indivial_i,:] = [22. 6. 29. 35.]
552 cord_individual_obj[indivial_i,:] = [23. 6. 49. 55.]
553 cord_individual_obj[indivial_i,:] = [24. 6. 59. 65.]
554
555 min(cord_individual_obj[:,3]) = 22.0
556 histol_G_best_iter[iter,3] = 22.0
557 Begin iteration:
558
559 iter = 17
560 cord_individual_obj[indivial_i,:] = [ 0. 6. 16. 22.]
561 cord_individual_obj[indivial_i,:] = [ 1. 6. 36. 42.]
562 cord_individual_obj[indivial_i,:] = [ 2. 6. 37. 43.]
563 cord_individual_obj[indivial_i,:] = [ 3. 6. 65. 71.]
564 cord_individual_obj[indivial_i,:] = [ 4. 7. 48. 55.]
565 cord_individual_obj[indivial_i,:] = [ 5. 6. 85. 91.]
566 cord_individual_obj[indivial_i,:] = [ 6. 5. 35. 40.]
567 cord_individual_obj[indivial_i,:] = [ 7. 7. 50. 57.]
568 cord_individual_obj[indivial_i,:] = [ 8. 7. 69. 76.]
569 cord_individual_obj[indivial_i,:] = [ 9. 6. 38. 44.]
570 cord_individual_obj[indivial_i,:] = [10. 6. 36. 42.]
571 cord_individual_obj[indivial_i,:] = [11. 5. 44. 49.]
572 cord_individual_obj[indivial_i,:] = [12. 7. 38. 45.]
573 cord_individual_obj[indivial_i,:] = [13. 6. 51. 57.]
574 cord_individual_obj[indivial_i,:] = [14. 6. 54. 60.]
575 cord_individual_obj[indivial_i,:] = [15. 5. 53. 58.]
576 cord_individual_obj[indivial_i,:] = [16. 6. 42. 48.]
577 cord_individual_obj[indivial_i,:] = [17. 6. 44. 50.]
578 cord_individual_obj[indivial_i,:] = [18. 5. 44. 49.]
579 cord_individual_obj[indivial_i,:] = [19. 6. 38. 44.]
580 cord_individual_obj[indivial_i,:] = [20. 6. 56. 62.]
581 cord_individual_obj[indivial_i,:] = [21. 7. 52. 59.]
582 cord_individual_obj[indivial_i,:] = [22. 5. 113. 118.]
583 cord_individual_obj[indivial_i,:] = [23. 6. 52. 58.]

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unknown

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584     cord_individual_obj[indivial_i, :] = [24. 6. 56. 62.]  
585  
586     min(cord_individual_obj[:, 3]) = 22.0  
587     historl_G_best_iter[iter, 3] = 22.0  
588 Begin iteration:  
589  
590 iter = 18  
591     cord_individual_obj[indivial_i, :] = [ 0. 7. 40. 47.]  
592     cord_individual_obj[indivial_i, :] = [ 1. 6. 38. 44.]  
593     cord_individual_obj[indivial_i, :] = [ 2. 7. 20. 27.]  
594     cord_individual_obj[indivial_i, :] = [ 3. 6. 40. 46.]  
595     cord_individual_obj[indivial_i, :] = [ 4. 7. 48. 55.]  
596     cord_individual_obj[indivial_i, :] = [ 5. 6. 61. 67.]  
597     cord_individual_obj[indivial_i, :] = [ 6. 5. 38. 43.]  
598     cord_individual_obj[indivial_i, :] = [ 7. 7. 32. 39.]  
599     cord_individual_obj[indivial_i, :] = [ 8. 8. 61. 69.]  
600     cord_individual_obj[indivial_i, :] = [ 9. 7. 42. 49.]  
601     cord_individual_obj[indivial_i, :] = [10. 5. 36. 41.]  
602     cord_individual_obj[indivial_i, :] = [11. 6. 54. 60.]  
603     cord_individual_obj[indivial_i, :] = [12. 6. 48. 54.]  
604     cord_individual_obj[indivial_i, :] = [13. 6. 45. 51.]  
605     cord_individual_obj[indivial_i, :] = [14. 6. 50. 56.]  
606     cord_individual_obj[indivial_i, :] = [15. 6. 61. 67.]  
607     cord_individual_obj[indivial_i, :] = [16. 5. 40. 45.]  
608     cord_individual_obj[indivial_i, :] = [17. 6. 52. 58.]  
609     cord_individual_obj[indivial_i, :] = [18. 5. 43. 48.]  
610     cord_individual_obj[indivial_i, :] = [19. 7. 35. 42.]  
611     cord_individual_obj[indivial_i, :] = [20. 7. 58. 65.]  
612     cord_individual_obj[indivial_i, :] = [21. 6. 36. 42.]  
613     cord_individual_obj[indivial_i, :] = [22. 6. 16. 22.]  
614     cord_individual_obj[indivial_i, :] = [23. 6. 46. 52.]  
615     cord_individual_obj[indivial_i, :] = [24. 6. 53. 59.]  
616  
617     min(cord_individual_obj[:, 3]) = 22.0  
618     historl_G_best_iter[iter, 3] = 22.0  
619 Begin iteration:  
620  
621 iter = 19  
622     cord_individual_obj[indivial_i, :] = [ 0. 6. 54. 60.]  
623     cord_individual_obj[indivial_i, :] = [ 1. 5. 33. 38.]  
624     cord_individual_obj[indivial_i, :] = [ 2. 7. 51. 58.]  
625     cord_individual_obj[indivial_i, :] = [ 3. 5. 39. 44.]  
626     cord_individual_obj[indivial_i, :] = [ 4. 6. 51. 57.]  
627     cord_individual_obj[indivial_i, :] = [ 5. 7. 82. 89.]  
628     cord_individual_obj[indivial_i, :] = [ 6. 6. 33. 39.]  
629     cord_individual_obj[indivial_i, :] = [ 7. 6. 37. 43.]  
630     cord_individual_obj[indivial_i, :] = [ 8. 6. 16. 22.]  
631     cord_individual_obj[indivial_i, :] = [ 9. 5. 37. 42.]  
632     cord_individual_obj[indivial_i, :] = [10. 4. 33. 37.]  
633     cord_individual_obj[indivial_i, :] = [11. 6. 33. 39.]  
634     cord_individual_obj[indivial_i, :] = [12. 7. 56. 63.]  
635     cord_individual_obj[indivial_i, :] = [13. 7. 62. 69.]  
636     cord_individual_obj[indivial_i, :] = [14. 6. 36. 42.]  
637     cord_individual_obj[indivial_i, :] = [15. 6. 49. 55.]  
638     cord_individual_obj[indivial_i, :] = [16. 5. 48. 53.]  
639     cord_individual_obj[indivial_i, :] = [17. 7. 52. 59.]  
640     cord_individual_obj[indivial_i, :] = [18. 5. 43. 48.]  
641     cord_individual_obj[indivial_i, :] = [19. 6. 37. 43.]  
642     cord_individual_obj[indivial_i, :] = [20. 7. 50. 57.]  
643     cord_individual_obj[indivial_i, :] = [21. 6. 46. 52.]  
644     cord_individual_obj[indivial_i, :] = [22. 6. 33. 39.]  
645     cord_individual_obj[indivial_i, :] = [23. 6. 62. 68.]  
646     cord_individual_obj[indivial_i, :] = [24. 6. 56. 62.]  
647  
648     min(cord_individual_obj[:, 3]) = 22.0  
649     historl_G_best_iter[iter, 3] = 22.0  
650 Begin iteration:  
651  
652 iter = 20  
653     cord_individual_obj[indivial_i, :] = [ 0. 5. 52. 57.]  
654     cord_individual_obj[indivial_i, :] = [ 1. 6. 24. 30.]  
655     cord_individual_obj[indivial_i, :] = [ 2. 7. 40. 47.]  
656     cord_individual_obj[indivial_i, :] = [ 3. 7. 31. 38.]  
657     cord_individual_obj[indivial_i, :] = [ 4. 8. 75. 83.]  
658     cord_individual_obj[indivial_i, :] = [ 5. 6. 16. 22.]  
659     cord_individual_obj[indivial_i, :] = [ 6. 7. 71. 78.]  
660     cord_individual_obj[indivial_i, :] = [ 7. 7. 61. 68.]  
661     cord_individual_obj[indivial_i, :] = [ 8. 7. 51. 58.]  
662     cord_individual_obj[indivial_i, :] = [ 9. 8. 39. 47.]  
663     cord_individual_obj[indivial_i, :] = [10. 5. 64. 69.]  
664     cord_individual_obj[indivial_i, :] = [11. 5. 75. 80.]  
665     cord_individual_obj[indivial_i, :] = [12. 7. 149. 156.]  
666     cord_individual_obj[indivial_i, :] = [13. 6. 22. 28.]  
667     cord_individual_obj[indivial_i, :] = [14. 6. 51. 57.]
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unknown

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668 cord_individual_obj[individual_i, :] = [15. 7. 35. 42.]
669 cord_individual_obj[individual_i, :] = [16. 5. 60. 65.]
670 cord_individual_obj[individual_i, :] = [17. 5. 77. 82.]
671 cord_individual_obj[individual_i, :] = [18. 7. 26. 33.]
672 cord_individual_obj[individual_i, :] = [19. 6. 55. 61.]
673 cord_individual_obj[individual_i, :] = [20. 6. 40. 46.]
674 cord_individual_obj[individual_i, :] = [21. 7. 72. 79.]
675 cord_individual_obj[individual_i, :] = [22. 5. 33. 38.]
676 cord_individual_obj[individual_i, :] = [23. 8. 62. 70.]
677 cord_individual_obj[individual_i, :] = [24. 6. 38. 44.]
678
679 min(cord_individual_obj[:, 3]) = 22.0
680 historl_G_best_iter[iter, 3] = 22.0
681 Iteration calculate over
682
683
684
685
686 All item are in Bin and:
687 Bin area = 1080
688 Real_area = 148.0
689 Proportion_of_area = 0.13703703703703704
690 BEST_CHROM =
691 berth: [4. 10. 11. 4.5 16. 13. 20.5 23.5 22.5 11.5 15.5]
692 time: [0. 0. 1. 2. 1. 3. 5. 0. 2. 2. 0.]
693 num_QC: [3. 3. 3. 3. 6. 2. 2. 2. 3. 4.]
694 Objective function values and some other indicators:
695 Obj0 = 6.00          Obj1 = 16.00        Obj0 + Obj1 = 22.00
696 Total movement of crane: 0.00
697 Total waiting time in berth position: 16.00
698 Total index of q during berthing: 539.00
699 Specific arrangement for each vessel:
700 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
    .0      gama_i1 + 1: 2.0      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
701 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: 0.0
    .0      gama_i1 + 1: 1.0      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
702 V_id: 2      li: 6.0      xi: 11.0      bow of i: 8.0      tail of i: 14.0      gama_i0: 1.0      gama_i1: 1.0
    .0      gama_i1 + 1: 2.0      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
703 V_id: 3      li: 9.0      xi: 4.5      bow of i: 0.0      tail of i: 9.0      gama_i0: 2.0      gama_i1: 4.0
    .0      gama_i1 + 1: 5.0      gama_i1 - gama_i0: 2.0      duration_time_i: 3.0      demand_i: 160.0      work load_i:
160.0      work load gap_i: 0
704 V_id: 4      li: 4.0      xi: 16.0      bow of i: 14.0      tail of i: 18.0      gama_i0: 1.0      gama_i1: 2.0
    .0      gama_i1 + 1: 3.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 100.0      work
load_i: 100.0      work load gap_i: 0
705 V_id: 5      li: 8.0      xi: 13.0      bow of i: 9.0      tail of i: 17.0      gama_i0: 3.0      gama_i1: 4.0
    .0      gama_i1 + 1: 5.0      gama_i1 - gama_i0: 1.0      duration_time_i: 2.0      demand_i: 140.0      work
load_i: 140.0      work load gap_i: 0
706 V_id: 6      li: 7.0      xi: 20.5      bow of i: 17.0      tail of i: 24.0      gama_i0: 5.0      gama_i1: 6.0
    .0      gama_i1 + 1: 7.0      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
707 V_id: 7      li: 9.0      xi: 23.5      bow of i: 19.0      tail of i: 28.0      gama_i0: 0.0      gama_i1: 1.0
    .0      gama_i1 + 1: 2.0      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
708 V_id: 8      li: 9.0      xi: 22.5      bow of i: 18.0      tail of i: 27.0      gama_i0: 2.0      gama_i1: 4.0
    .0      gama_i1 + 1: 5.0      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
709 V_id: 9      li: 5.0      xi: 11.5      bow of i: 9.0      tail of i: 14.0      gama_i0: 2.0      gama_i1: 2.0
    .0      gama_i1 + 1: 3.0      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
710 V_id: 10     li: 7.0      xi: 15.5      bow of i: 12.0      tail of i: 19.0      gama_i0: 0.0      gama_i1: 1.0
    .0      gama_i1 + 1: 1.0      gama_i1 - gama_i0: 0.0      duration_time_i: 1.0      demand_i: 80.0      work
load_i: 80.0      work load gap_i: 0
711
712 Algorithm finished and the total CPU time: 282 s
713 End
714

```