

```
1 /Applications/anaconda3/bin/python /Applications/PyCharm.  
app/Contents/helpers/pydev/pydev_run_in_console.py 55199  
55200 "/Users/zhenwei/Dropbox (Personal)/BCM/_Code/  
inversePOMDP/Code/twobox_main.py"  
2 Running /Users/zhenwei/Dropbox (Personal)/BCM/_Code/  
inversePOMDP/Code/twobox_main.py  
3  
4 import sys; print('Python %s on %s' % (sys.version, sys.  
platform))  
5 sys.path.extend(['/Users/zhenwei/Dropbox (Personal)/BCM/  
_Code/inversePOMDP/Code'])  
6  
7 Python 3.6.5 |Anaconda, Inc.| (default, Apr 26 2018, 08:42:  
37)  
8 Type 'copyright', 'credits' or 'license' for more  
information  
9 IPython 6.4.0 -- An enhanced Interactive Python. Type '?'  
for help.  
10 Generating data ...  
11 Data stored in files  
12  
13 The true world parameters of box1 are: appearing rate = 0.2  
, disappearing rate = 0.15  
14 The true world parameters of box2 are: appearing rate = 0.  
25 ,disappearing rate = 0.12  
15  
16 The internal model parameters are [0.3, 0.3, 0.1, 0.1, 0.1  
, 0.4, 0.6]  
17 gamma1/2, rate that food appears of box 1/2  
18 epsilon1/2, rate that food disappears of box 1/2  
19 groom, reward of grooming  
20 travelCost, cost of traveling action  
21 pushButtonCost, cost of pressing the button per unit of  
reward  
22  
23 The initial points for estimation are: [array([0.2 , 0.25,  
0.15, 0.12, 0.2 , 0.45, 0.7 ])]  
24  
25 EM algorithm begins ...  
26  
27 For the 1 -th set of data:  
28  
29 #####  
30 1 -th initial estimation: [0.2 0.25 0.15 0.12 0.2 0.45 0  
.7 ]  
31 The 1 -th iteration of the EM(G) algorithm  
32 [0.2 0.25 0.15 0.12 0.2 0.45 0.7 ]  
33 -11877.201935521785  
34 -3180.638787764843  
35
```

```

36 M-step
37 [0.2 0.25 0.15 0.12 0.2 0.45 0.7 ]
38 -11877.201935521785
39 -3180.638787764843
40      [ 0.23095849  0.26869219  0.10854193  0.08807325
        -0.03303759  0.12903309
41  0.7526053 ]
42      -15068.441346933858
43      [0.21547924  0.25934609  0.12927097  0.10403662  0.
        08348121  0.28951654
44  0.72630265]
45      -11979.05996072335
46      [0.20773962  0.25467305  0.13963548  0.11201831  0.
        1417406  0.36975827
47  0.71315132]
48      -11763.294532713784
49
50  [0.20773962  0.25467305  0.13963548  0.11201831  0.1417406  0.
        36975827
51  0.71315132]
52 -11763.294532713784
53 -3066.731384956842
54      [0.14650012  0.21958433  0.21730149  0.17911166  0.
        10545042  0.37315508
55  0.7252383 ]
56      -12832.314538260613
57      [0.17711987  0.23712869  0.17846849  0.14556499  0.
        12359551  0.37145668
58  0.71919481]
59      -11940.006893751291
60      [0.19242975  0.24590087  0.15905199  0.12879165  0.
        13266806  0.37060747
61  0.71617307]
62      -11764.293234860983
63 The 2 -th iteration of the EM(G) algorithm
64 [0.20773962  0.25467305  0.13963548  0.11201831  0.1417406  0.
        36975827
65  0.71315132]
66 -11690.97048859144
67 -3044.7977221193705
68
69 M-step
70 [0.20773962  0.25467305  0.13963548  0.11201831  0.1417406  0.
        36975827
71  0.71315132]
72 -11690.97048859144
73 -3044.7977221193705
74      [ 0.23486321  0.26994139  0.10116542  0.08667744
        -0.00220887  0.38399434
75  0.76251416]

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76      -13351.626632881824
77      [0.22130142 0.26230722 0.12040045 0.09934788 0.
    06976587 0.3768763
78  0.73783274]
79      -11709.207514827982
80      [0.21452052 0.25849013 0.13001797 0.10568309 0.
    10575324 0.37331729
81  0.72549203]
82      -11678.128199360708
83
84  [0.21452052 0.25849013 0.13001797 0.10568309 0.10575324 0
    .37331729
85  0.72549203]
86 -11678.128199360708
87 -3031.955432888639
88      [0.16193106 0.23176731 0.20399189 0.16015202 0.
    08052782 0.3881988
89  0.73805673]
90      -12502.816486131604
91      [0.18822579 0.24512872 0.16700493 0.13291756 0.
    09314053 0.38075804
92  0.73177438]
93      -11815.088591223583
94      [0.20137315 0.25180943 0.14851145 0.11930032 0.
    09944688 0.37703766
95  0.72863321]
96      -11679.458407791397
97 The 3 -th iteration of the EM(G) algorithm
98 [0.21452052 0.25849013 0.13001797 0.10568309 0.10575324 0.
    37331729
99  0.72549203]
100 -11604.89054311162
101 -3015.256064733403
102
103 M-step
104 [0.21452052 0.25849013 0.13001797 0.10568309 0.10575324 0.
    .37331729
105 0.72549203]
106 -11604.89054311162
107 -3015.256064733403
108      [0.23723313 0.27044391 0.09644558 0.08744143 0.
    00674615 0.43403052
109 0.77700839]
110      -12813.705981010738
111      [0.22587683 0.26446702 0.11323178 0.09656226 0.
    05624969 0.4036739
112 0.75125021]
113      -11614.025090905267
114      [0.22019867 0.26147858 0.12162487 0.10112268 0.
    08100146 0.3884956

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```
115 0.73837112]
116          -11595.73745589114
117
118 [0.22019867 0.26147858 0.12162487 0.10112268 0.08100146 0
.3884956
119 0.73837112]
120 -11595.73745589114
121 -3006.1029775129227
122      [0.17750634 0.24282282 0.18740209 0.14110891 0.
0599209 0.39672832
123 0.7507952 ]
124          -12155.086422475673
125      [0.19885251 0.2521507 0.15451348 0.12111579 0.
07046118 0.39261196
126 0.74458316]
127          -11688.688329442024
128      [0.20952559 0.25681464 0.13806918 0.11111923 0.
07573132 0.39055378
129 0.74147714]
130          -11596.67984249976
131 The 4 -th iteration of the EM(G) algorithm
132 [0.22019867 0.26147858 0.12162487 0.10112268 0.08100146 0.
3884956
133 0.73837112]
134 -11527.785867804521
135 -2994.6494705266396
136
137 M-step
138 [0.22019867 0.26147858 0.12162487 0.10112268 0.08100146 0.
3884956
139 0.73837112]
140 -11527.785867804521
141 -2994.6494705266396
142      [ 0.23955556 0.27157973 0.09203071 0.0868269
-0.00128138 0.42273621
143 0.78926536]
144          -13055.807979210145
145      [0.22987712 0.26652915 0.10682779 0.09397479 0.
03986004 0.4056159
146 0.76381824]
147          -11538.450480623755
148      [0.2250379 0.26400386 0.11422633 0.09754873 0.
06043075 0.39705575
149 0.75109468]
150          -11522.689125948165
151
152 [0.2250379 0.26400386 0.11422633 0.09754873 0.06043075 0
.39705575
153 0.75109468]
154 -11522.689125948165
```

```
155 -2989.5527286702836
156 [0.18959822 0.24949475 0.1733076 0.13001936 0.
     04827874 0.4077998
157 0.76414151]
158 -11940.714288187026
159 [0.20731806 0.25674931 0.14376697 0.11378405 0.
     05435474 0.40242778
160 0.75761809]
161 -11592.651372629654
162 [0.21617798 0.26037658 0.12899665 0.10566639 0.
     05739275 0.39974176
163 0.75435639]
164 -11523.77358635312
165 The 5 -th iteration of the EM(G) algorithm
166 [0.2250379 0.26400386 0.11422633 0.09754873 0.06043075 0.
     39705575
167 0.75109468]
168 -11457.34446527792
169 -2981.208409662582
170
171 M-step
172 [0.2250379 0.26400386 0.11422633 0.09754873 0.06043075 0.
     39705575
173 0.75109468]
174 -11457.34446527792
175 -2981.208409662582
176 [0.24080815 0.27168879 0.09043399 0.08929807 0.
     01418275 0.4415404
177 0.80450649]
178 -11514.885364327829
179 [0.23292302 0.26784633 0.10233016 0.0934234 0.
     03730675 0.41929807
180 0.77780059]
181 -11462.036442752917
182 [0.22898046 0.2659251 0.10827825 0.09548607 0.
     04886875 0.40817691
183 0.76444763]
184 -11453.600755511563
185
186 [0.22898046 0.2659251 0.10827825 0.09548607 0.04886875 0
     .40817691
187 0.76444763]
188 -11453.600755511563
189 -2977.4646998962253
190 [0.20191351 0.25746575 0.15632613 0.11513639 0.
     03708699 0.41127361
191 0.77643048]
192 -11694.029026956328
193 [0.21544699 0.26169542 0.13230219 0.10531123 0.
     04297787 0.40972526
```

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194 0.77043906]
195          -11493.50373195222
196          [0.22221372 0.26381026 0.12029022 0.10039865 0.
197          04592331 0.40895108
198 0.76744335]
199          -11453.940960579184
200 The 6 -th iteration of the EM(G) algorithm
200 [0.22898046 0.2659251 0.10827825 0.09548607 0.04886875 0.
201          40817691
201 0.76444763]
202 -11399.87549001196
203 -2972.4132075321522
204
205 M-step
206 [0.22898046 0.2659251 0.10827825 0.09548607 0.04886875 0.
207          40817691
207 0.76444763]
208 -11399.87549001196
209 -2972.4132075321522
210          [0.243177 0.27343329 0.08659945 0.08748231 0.
210          00368492 0.42175421
211 0.81335845]
212          -11460.527277026673
213          [0.23607873 0.26967919 0.09743885 0.09148419 0.
213          02627684 0.41496556
214 0.78890304]
215          -11406.887336714723
216          [0.2325296 0.26780215 0.10285855 0.09348513 0.
216          03757279 0.41157124
217 0.77667534]
218          -11398.165321192802
219
220 [0.2325296 0.26780215 0.10285855 0.09348513 0.03757279 0
220          .41157124
221 0.77667534]
222 -11398.165321192802
223 -2970.7030387129944
224          [0.20874398 0.25947835 0.14746561 0.113389 0.
224          03495041 0.41993009
225 0.78921196]
226          -11608.514763973279
227          [0.22063679 0.26364025 0.12516208 0.10343707 0.
227          0362616 0.41575066
228 0.78294365]
229          -11433.426240811948
230          [0.22658319 0.2657212 0.11401031 0.0984611 0.
230          0369172 0.41366095
231 0.77980949]
232          -11398.710971633524
233 The 7 -th iteration of the EM(G) algorithm

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```
234 [0.2325296 0.26780215 0.10285855 0.09348513 0.03757279 0.  
41157124  
235 0.77667534]  
236 -11343.003782536205  
237 -2966.530416523119  
238  
239 M-step  
240 [0.2325296 0.26780215 0.10285855 0.09348513 0.03757279 0.  
41157124  
241 0.77667534]  
242 -11343.003782536205  
243 -2966.530416523119  
244 [0.24403754 0.27360201 0.08667553 0.09020971 0.  
02924732 0.44630692  
245 0.82782556]  
246 -11377.211826337989  
247 [0.23828357 0.27070208 0.09476704 0.09184742 0.  
03341006 0.42893908  
248 0.80225045]  
249 -11346.485045084593  
250 [0.23540658 0.26925211 0.09881279 0.09266627 0.  
03549142 0.42025516  
251 0.78946289]  
252 -11341.213375561805  
253  
254 [0.23540658 0.26925211 0.09881279 0.09266627 0.03549142 0  
.42025516  
255 0.78946289]  
256 -11341.213375561805  
257 -2964.740009548719  
258 [0.2183811 0.26567484 0.13193476 0.10156983 0.  
02402706 0.41550275  
259 0.79912663]  
260 -11440.873289209967  
261 [0.22689384 0.26746348 0.11537378 0.09711805 0.  
02975924 0.41787896  
262 0.79429476]  
263 -11357.01023055088  
264 [0.23115021 0.26835779 0.10709328 0.09489216 0.  
03262533 0.41906706  
265 0.79187883]  
266 -11340.786034639641  
267  
268 [0.23115021 0.26835779 0.10709328 0.09489216 0.03262533 0  
.41906706  
269 0.79187883]  
270 -11340.786034639641  
271 -2964.312668626555  
272 [0.23616699 0.26958383 0.09721581 0.09221326 0.  
03055801 0.41876985
```

```
273 0.7943417 ]
274      -11341.148441492014
275 The 8 -th iteration of the EM(G) algorithm
276 [0.23115021 0.26835779 0.10709328 0.09489216 0.03262533 0.
41906706
277 0.79187883]
278 -11365.451520706698
279 -2962.5524878190445
280
281 M-step
282 [0.23115021 0.26835779 0.10709328 0.09489216 0.03262533 0.
41906706
283 0.79187883]
284 -11365.451520706698
285 -2962.5524878190445
286      [ 0.24520153  0.27592423  0.08582491  0.08703487
-0.00145579  0.41369282
287 0.83083186]
288      -12570.093460594371
289      [0.23817587 0.27214101 0.0964591  0.09096352 0.
01558477 0.41637994
290 0.81135535]
291      -11378.708613066077
292      [0.23466304 0.2702494  0.10177619 0.09292784 0.
02410505 0.4177235
293 0.80161709]
294      -11366.435258768992
295      [0.23290663 0.2693036  0.10443474 0.09391     0.
02836519 0.41839528
296 0.79674796]
297      -11364.596202898922
298
299 [0.23290663 0.2693036  0.10443474 0.09391     0.02836519 0
.41839528
300 0.79674796]
301 -11364.596202898922
302 -2961.697170011268
303      [0.2279998  0.26772209 0.11422622 0.09843162 0.
02718627 0.42043844
304 0.80189585]
305      -11370.429856845294
306      [0.23045321 0.26851285 0.10933048 0.09617081 0.
02777573 0.41941686
307 0.7993219 ]
308      -11364.292844540925
309
310 [0.23045321 0.26851285 0.10933048 0.09617081 0.02777573 0
.41941686
311 0.7993219 ]
312 -11364.292844540925
```

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313 -2961.3938116532718
314 [0.23359071 0.26987048 0.10349275 0.09339724 0.
     02669046 0.41990645
315 0.80171434]
316 -11364.205801247252
317
318 [0.23359071 0.26987048 0.10349275 0.09339724 0.02669046 0
     .41990645
319 0.80171434]
320 -11364.205801247252
321 -2961.306768359598
322 [0.22993067 0.26841126 0.11058558 0.09705772 0.
     02600628 0.4206145
323 0.80413513]
324 -11364.363951424477
325 The 9 -th iteration of the EM(G) algorithm
326 [0.23359071 0.26987048 0.10349275 0.09339724 0.02669046 0.
     41990645
327 0.80171434]
328 -11325.372261400462
329 -2959.3376122102945
330
331 M-step
332 [0.23359071 0.26987048 0.10349275 0.09339724 0.02669046 0.
     41990645
333 0.80171434]
334 -11325.372261400462
335 -2959.3376122102945
336 [0.24610507 0.27652978 0.0854119 0.08816598 0.
     01720359 0.43205848
337 0.84111733]
338 -11362.802306420324
339 [0.23984789 0.27320013 0.09445232 0.09078161 0.
     02194703 0.42598247
340 0.82141584]
341 -11331.880110537835
342 [0.2367193 0.27153531 0.09897254 0.09208943 0.
     02431875 0.42294446
343 0.81156509]
344 -11325.543494507307
345 [0.235155 0.2707029 0.10123264 0.09274334 0.
     0255046 0.42142546
346 0.80663972]
347 -11324.683446490359
348
349 [0.235155 0.2707029 0.10123264 0.09274334 0.0255046 0
     .42142546
350 0.80663972]
351 -11324.683446490359
352 -2958.6487973001913

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353 [0.23116072 0.26975217 0.10950114 0.09581286 0.
     02384466 0.4220973
354 0.81122348]
355 -11328.325320734535
356 [0.23315786 0.27022753 0.10536689 0.0942781 0.
     02467463 0.42176138
357 0.8089316 ]
358 -11324.397649009208
359
360 [0.23315786 0.27022753 0.10536689 0.0942781 0.02467463 0
     .42176138
361 0.8089316 ]
362 -11324.397649009208
363 -2958.362999819041
364 [0.2357325 0.27116136 0.10048527 0.09246465 0.
     02372592 0.42197515
365 0.8111212 ]
366 -11324.244607400055
367
368 [0.2357325 0.27116136 0.10048527 0.09246465 0.02372592 0
     .42197515
369 0.8111212 ]
370 -11324.244607400055
371 -2958.209958209887
372 [0.23277233 0.27024743 0.10641783 0.09489786 0.
     02316798 0.42244866
373 0.81333593]
374 -11324.24286430762
375 The 10 -th iteration of the EM(G) algorithm
376 [0.2357325 0.27116136 0.10048527 0.09246465 0.02372592 0.
     42197515
377 0.8111212 ]
378 -11291.375069274121
379 -2956.8667925214468
380
381 M-step
382 [0.2357325 0.27116136 0.10048527 0.09246465 0.02372592 0.
     42197515
383 0.8111212 ]
384 -11291.375069274121
385 -2956.8667925214468
386 [0.24772633 0.27801189 0.08324729 0.08680675 0.
     01599881 0.43020586
387 0.84711259]
388 -11326.615492431887
389 [0.24172942 0.27458663 0.09186628 0.0896357 0.
     01986236 0.42609051
390 0.82911689]
391 -11297.825820060281
392 [0.23873096 0.27287399 0.09617578 0.09105017 0.

```

```
392 02179414 0.42403283
393 0.82011905]
394 -11291.782274284908
395 [0.23723173 0.27201767 0.09833052 0.09175741 0.
02276003 0.42300399
396 0.81562013]
397 -11290.870902689856
398
399 [0.23723173 0.27201767 0.09833052 0.09175741 0.02276003 0
.42300399
400 0.81562013]
401 -11290.870902689856
402 -2956.3626259371813
403 [0.235216 0.27099529 0.10624774 0.09503133 0.
02150949 0.42350465
404 0.81983817]
405 -11294.373817037977
406 [0.23537666 0.27150648 0.10228913 0.09339437 0.
02213476 0.42325432
407 0.81772915]
408 -11290.661036796653
409
410 [0.23537666 0.27150648 0.10228913 0.09339437 0.02213476 0
.42325432
411 0.81772915]
412 -11290.661036796653
413 -2956.1527600439786
414 [0.23778807 0.27249179 0.09763863 0.09145362 0.
02135032 0.42336844
415 0.81973518]
416 -11290.569042497986
417
418 [0.23778807 0.27249179 0.09763863 0.09145362 0.02135032 0
.42336844
419 0.81973518]
420 -11290.569042497986
421 -2956.060765745311
422 [0.23504716 0.27152057 0.10327804 0.09404308 0.
02094383 0.42374542
423 0.82176927]
424 -11290.612085039567
425 The 11 -th iteration of the EM(G) algorithm
426 [0.23778807 0.27249179 0.09763863 0.09145362 0.02135032 0.
42336844
427 0.81973518]
428 -11256.300751242914
429 -2954.8150640983113
430
431 M-step
432 [0.23778807 0.27249179 0.09763863 0.09145362 0.02135032 0.
```

```
432 42336844
433 0.81973518]
434 -11256.300751242914
435 -2954.8150640983113
436 [0.24928558 0.27947348 0.08125123 0.08551816 0.
     01601234 0.430029
437 0.85281607]
438 -11289.497511679789
439 [0.24353682 0.27598264 0.08944493 0.08848589 0.
     01868133 0.42669872
440 0.83627562]
441 -11262.596212478715
442 [0.24066244 0.27423721 0.09354178 0.08996976 0.
     02001583 0.42503358
443 0.8280054 ]
444 -11256.849906509235
445 [0.23922526 0.2733645 0.09559021 0.09071169 0.
     02068307 0.42420101
446 0.82387029]
447 -11255.922837720093
448
449 [0.23922526 0.2733645 0.09559021 0.09071169 0.02068307 0
     .42420101
450 0.82387029]
451 -11255.922837720093
452 -2954.43715057549
453 [0.23579068 0.27230769 0.10313195 0.09410075 0.
     01965554 0.42451766
454 0.82773665]
455 -11259.213670334124
456 [0.23750797 0.2728361 0.09936108 0.09240622 0.
     02016931 0.42435934
457 0.82580347]
458 -11255.765173510623
459
460 [0.23750797 0.2728361 0.09936108 0.09240622 0.02016931 0
     .42435934
461 0.82580347]
462 -11255.765173510623
463 -2954.27948636602
464 [0.23975702 0.27384589 0.09495968 0.09039899 0.
     0194974 0.42439839
465 0.82764006]
466 -11255.710804231057
467
468 [0.23975702 0.27384589 0.09495968 0.09039899 0.0194974 0
     .42439839
469 0.82764006]
470 -11255.710804231057
471 -2954.2251170864547
```

```
472 [0.23723376 0.27285152 0.10028188 0.09306647 0.  
    01919403 0.42470358  
473 0.82950744]  
474 -11255.775246560193  
475 The 12 -th iteration of the EM(G) algorithm  
476 [0.23975702 0.27384589 0.09495968 0.09039899 0.0194974 0.  
    42439839  
477 0.82764006]  
478 -11220.541834747359  
479 -2953.082472324935  
480  
481 M-step  
482 [0.23975702 0.27384589 0.09495968 0.09039899 0.0194974 0.  
    42439839  
483 0.82764006]  
484 -11220.541834747359  
485 -2953.082472324935  
486 [0.25082697 0.28095639 0.07930369 0.0841681 0.  
    01575957 0.42987699  
487 0.85802847]  
488 -11252.10514647193  
489 [0.245292 0.27740114 0.08713168 0.08728354 0.  
    01762849 0.42713769  
490 0.84283426]  
491 -11226.706845948058  
492 [0.24252451 0.27562351 0.09104568 0.08884127 0.  
    01856294 0.42576804  
493 0.83523716]  
494 -11221.199724139922  
495 [0.24114076 0.2747347 0.09300268 0.08962013 0.  
    01903017 0.42508322  
496 0.83143861]  
497 -11220.262077750956  
498  
499 [0.24114076 0.2747347 0.09300268 0.08962013 0.01903017 0  
.42508322  
500 0.83143861]  
501 -11220.262077750956  
502 -2952.802715328533  
503 [0.23794214 0.27364019 0.10021671 0.09313334 0.  
    01817184 0.42527995  
504 0.8349863 ]  
505 -11223.382541699455  
506 [0.23954145 0.27418745 0.0966097 0.09137674 0.  
    018601 0.42518158  
507 0.83321246]  
508 -11220.144312991304  
509  
510 [0.23954145 0.27418745 0.0966097 0.09137674 0.018601 0  
.42518158
```

```
511 0.83321246]
512 -11220.144312991304
513 -2952.6849505688806
514 [0.24165033 0.27522315 0.09242927 0.08929843 0.
01801388 0.42517134
515 0.83489539]
516 -11220.11861745478
517
518 [0.24165033 0.27522315 0.09242927 0.08929843 0.01801388 0
.42517134
519 0.83489539]
520 -11220.11861745478
521 -2952.6592550323567
522 [0.23931714 0.27420425 0.09746615 0.09204825 0.
01778568 0.42542611
523 0.8366114 ]
524 -11220.198008950567
525 The 13 -th iteration of the EM(G) algorithm
526 [0.24165033 0.27522315 0.09242927 0.08929843 0.01801388 0.
42517134
527 0.83489539]
528 -11184.056805857239
529 -2951.6005636423524
530
531 M-step
532 [0.24165033 0.27522315 0.09242927 0.08929843 0.01801388 0.
42517134
533 0.83489539]
534 -11184.056805857239
535 -2951.6005636423524
536 [0.25233893 0.28244319 0.07742812 0.0828009 0.
01543024 0.42981239
537 0.86283831]
538 -11214.19562305206
539 [0.24699463 0.27883317 0.08492869 0.08604967 0.
01672206 0.42749186
540 0.84886685]
541 -11190.087838839076
542 [0.24432248 0.27702816 0.08867898 0.08767405 0.
01736797 0.4263316
543 0.84188112]
544 -11184.79419942213
545 [0.2429864 0.27612566 0.09055413 0.08848624 0.
01769092 0.42575147
546 0.83838826]
547 -11183.85366561511
548
549 [0.2429864 0.27612566 0.09055413 0.08848624 0.01769092 0
.42575147
550 0.83838826]
```

```
551 -11183.85366561511
552 -2951.3974234002235
553 [0.23999628 0.27499983 0.09746984 0.09210947 0.
      01695981 0.42586581
554 0.84164814]
555 -11186.821213156065
556 [0.24149134 0.27556275 0.09401198 0.09029786 0.
      01732537 0.42580864
557 0.8400182 ]
558 -11183.76642052747
559
560 [0.24149134 0.27556275 0.09401198 0.09029786 0.01732537 0
      .42580864
561 0.8400182 ]
562 -11183.76642052747
563 -2951.310178312584
564 [0.24347527 0.27661959 0.09003522 0.08815876 0.
      01680368 0.42576552
565 0.84156262]
566 -11183.761867903255
567 The 14 -th iteration of the EM(G) algorithm
568 [0.24149134 0.27556275 0.09401198 0.09029786 0.01732537 0.
      42580864
569 0.8400182 ]
570 -11198.765429414429
571 -2951.0598006988766
572
573 M-step
574 [0.24149134 0.27556275 0.09401198 0.09029786 0.01732537 0.
      42580864
575 0.8400182 ]
576 -11198.765429414429
577 -2951.0598006988766
578 [0.25290082 0.28330511 0.07750644 0.08248703 0.
      00854954 0.42487463
579 0.8645458 ]
580 -11237.69989175555
581 [0.24719608 0.27943393 0.08575921 0.08639244 0.
      01293746 0.42534163
582 0.852282 ]
583 -11207.038211912582
584 [0.24434371 0.27749834 0.0898856 0.08834515 0.
      01513141 0.42557514
585 0.8461501 ]
586 -11200.087630971615
587 [0.24291753 0.27653054 0.09194879 0.0893215 0.
      01622839 0.42569189
588 0.84308415]
589 -11198.721071901455
590
```

```
591 [0.24291753 0.27653054 0.09194879 0.0893215 0.01622839 0  
.42569189  
592 0.84308415]  
593 -11198.721071901455  
594 -2951.0154431859028  
595 [0.23956183 0.27512111 0.09959407 0.09362778 0.  
01596637 0.42626099  
596 0.84614067]  
597 -11202.72622704562  
598 [0.24123968 0.27582583 0.09577143 0.09147464 0.  
01609738 0.42597644  
599 0.84461241]  
600 -11198.714668166187  
601 The 15 -th iteration of the EM(G) algorithm  
602 [0.24291753 0.27653054 0.09194879 0.0893215 0.01622839 0.  
.42569189  
603 0.84308415]  
604 -11169.725043409802  
605 -2950.3396448203184  
606  
607 M-step  
608 [0.24291753 0.27653054 0.09194879 0.0893215 0.01622839 0.  
.42569189  
609 0.84308415]  
610 -11169.725043409802  
611 -2950.3396448203184  
612 [0.25370724 0.28400846 0.07673782 0.08224185 0.  
01494176 0.43067388  
613 0.86790078]  
614 -11202.326035589282  
615 [0.24831239 0.2802695 0.0843433 0.08578168 0.  
01558508 0.42818288  
616 0.85549247]  
617 -11176.557222191825  
618 [0.24561496 0.27840002 0.08814605 0.08755159 0.  
01590673 0.42693739  
619 0.84928831]  
620 -11170.754349866258  
621 [0.24426624 0.27746528 0.09004742 0.08843655 0.  
01606756 0.42631464  
622 0.84618623]  
623 -11169.6407935662  
624  
625 [0.24426624 0.27746528 0.09004742 0.08843655 0.01606756 0  
.42631464  
626 0.84618623]  
627 -11169.6407935662  
628 -2950.2553949767153  
629 [0.24125592 0.27623802 0.09705653 0.09231973 0.  
01539376 0.42637308
```

```
630 0.8490676 ]
631          -11172.881834646994
632          [0.24276108 0.27685165 0.09355198 0.09037814 0.
633 01573066 0.42634386
634 0.84762692]
635
636 [0.24276108 0.27685165 0.09355198 0.09037814 0.01573066 0
637 .42634386
638 0.84762692]
639 -11169.609217421345
640 -2950.2238188318606
641 [0.2447614 0.27797581 0.08951923 0.0880718 0.
642 01524947 0.42628646
643 0.84898983]
644 -11169.664380408803
645 The 16 -th iteration of the EM(G) algorithm
646 [0.24276108 0.27685165 0.09355198 0.09037814 0.01573066 0.
647 .42634386
648 0.84762692]
649 -11185.422720112058
650 -2949.9592552490194
651
652 M-step
653 [0.24276108 0.27685165 0.09355198 0.09037814 0.01573066 0.
654 .42634386
655 0.84762692]
656 -11185.422720112058
657 -2949.9592552490194
658 [0.25425464 0.28484313 0.07684319 0.08198561 0.
659 00759688 0.42518299
660 0.86924622]
661 -11226.80298935636
662 [0.24850786 0.28084739 0.08519758 0.08618187 0.
663 01166377 0.42576342
664 0.85843657]
665 -11194.464109560475
666 [0.24563447 0.27884952 0.08937478 0.08828001 0.
667 01369722 0.42605364
668 0.85303174]
669 -11187.014169966089
670 [0.24419778 0.27785059 0.09146338 0.08932907 0.
671 01471394 0.42619875
672 0.85032933]
673 -11185.484047797696
674 [0.24347943 0.27735112 0.09250768 0.08985361 0.
675 0152223 0.4262713
676 0.84897812]
677 -11185.269631996238
678
679
```

```
670 [0.24347943 0.27735112 0.09250768 0.08985361 0.0152223 0
     .4262713
671 0.84897812]
672 -11185.269631996238
673 -2949.8061671332
674 [0.24299607 0.27722295 0.09392551 0.09073586 0.
     01492471 0.42637239
675 0.8503322 ]
676 -11185.1360669887
677
678 [0.24299607 0.27722295 0.09392551 0.09073586 0.01492471 0
     .42637239
679 0.8503322 ]
680 -11185.1360669887
681 -2949.672602125662
682 [0.24387543 0.27781977 0.09238447 0.08979395 0.
     01455764 0.4264203
683 0.85163362]
684 -11185.024337310304
685
686 [0.24387543 0.27781977 0.09238447 0.08979395 0.01455764 0
     .4264203
687 0.85163362]
688 -11185.024337310304
689 -2949.560872447266
690 [0.24308162 0.27743135 0.0943305 0.09114142 0.
     01433481 0.42656863
691 0.85293242]
692 -11184.937719771719
693
694 [0.24308162 0.27743135 0.0943305 0.09114142 0.01433481 0
     .42656863
695 0.85293242]
696 -11184.937719771719
697 -2949.4742549086805
698 [0.24423024 0.27823987 0.09211017 0.08955439 0.
     01396375 0.42660017
699 0.85416492]
700 -11184.887196155358
701
702 [0.24423024 0.27823987 0.09211017 0.08955439 0.01396375 0
     .42660017
703 0.85416492]
704 -11184.887196155358
705 -2949.4237312923196
706 [0.24303163 0.27747848 0.09482466 0.09167888 0.
     01379403 0.42677255
707 0.85540972]
708 -11184.881946952866
709 The 17 -th iteration of the EM(G) algorithm
```

```
710 [0.24423024 0.27823987 0.09211017 0.08955439 0.01396375 0.  
    42660017  
711 0.85416492]  
712 -11158.655966558914  
713 -2948.938852452735  
714  
715 M-step  
716 [0.24423024 0.27823987 0.09211017 0.08955439 0.01396375 0.  
    42660017  
717 0.85416492]  
718 -11158.655966558914  
719 -2948.938852452735  
720      [0.2554181 0.28615301 0.07605678 0.08143269 0.  
    0119338 0.42970657  
721 0.87439834]  
722      -11196.516877198948  
723      [0.24982417 0.28219644 0.08408347 0.08549354 0.  
    01294878 0.42815337  
724 0.86428163]  
725      -11167.013761682545  
726      [0.2470272 0.28021816 0.08809682 0.08752397 0.  
    01345627 0.42737677  
727 0.85922328]  
728      -11160.16896387823  
729      [0.24562872 0.27922901 0.09010349 0.08853918 0.  
    01371001 0.42698847  
730 0.8566941 ]  
731      -11158.743169216352  
732      [0.24492948 0.27873444 0.09110683 0.08904679 0.  
    01383688 0.42679432  
733 0.85542951]  
734      -11158.53189255896  
735  
736      [0.24492948 0.27873444 0.09110683 0.08904679 0.01383688 0  
    .42679432  
737 0.85542951]  
738 -11158.53189255896  
739 -2948.814778452781  
740      [0.24448539 0.27862606 0.09246126 0.08989002 0.  
    01366813 0.42692881  
741 0.85666167]  
742      -11158.425519530481  
743  
744      [0.24448539 0.27862606 0.09246126 0.08989002 0.01366813 0  
    .42692881  
745 0.85666167]  
746 -11158.425519530481  
747 -2948.7084054243023  
748      [0.24532298 0.2792017 0.09099764 0.0889958 0.  
    01337444 0.42696299
```

```
749 0.85783702]
750          -11158.337958509124
751
752 [0.24532298 0.2792017 0.09099764 0.0889958 0.01337444 0
    .42696299
753 0.85783702]
754 -11158.337958509124
755 -2948.6208444029453
756 [0.24458611 0.27884429 0.09284701 0.09027975 0.
    01320227 0.42708241
757 0.85900925]
758          -11158.271957090277
759
760 [0.24458611 0.27884429 0.09284701 0.09027975 0.01320227 0
    .42708241
761 0.85900925]
762 -11158.271957090277
763 -2948.5548429840983
764 [0.2456688 0.27961511 0.09074858 0.08877693 0.
    01288507 0.42709177
765 0.86012019]
766          -11158.237117498591
767
768 [0.2456688 0.27961511 0.09074858 0.08877693 0.01288507 0
    .42709177
769 0.86012019]
770 -11158.237117498591
771 -2948.520003392412
772 [0.2445562 0.27890634 0.09331248 0.09079133 0.
    01275421 0.42723409
773 0.86124349]
774          -11158.24127941341
775 The 18 -th iteration of the EM(G) algorithm
776 [0.2456688 0.27961511 0.09074858 0.08877693 0.01288507 0.
    42709177
777 0.86012019]
778 -11132.375149627082
779 -2948.0741838960294
780
781 M-step
782 [0.2456688 0.27961511 0.09074858 0.08877693 0.01288507 0.
    42709177
783 0.86012019]
784 -11132.375149627082
785 -2948.0741838960294
786 [0.25670974 0.28760744 0.07490762 0.0804349 0.
    0114387 0.42969345
787 0.87839329]
788          -11170.058826944934
789          [0.25118927 0.28361127 0.0828281 0.08460592 0.
```

```
789 01216189 0.42839261
790 0.86925674]
791      -11140.794990920003
792          [0.24842904 0.28161319 0.08678834 0.08669143 0.
    01252348 0.42774219
793 0.86468847]
794      -11133.957055440338
795          [0.24704892 0.28061415 0.08876846 0.08773418 0.
    01270428 0.42741698
796 0.86240433]
797      -11132.506305157289
798          [0.24635886 0.28011463 0.08975852 0.08825556 0.
    01279468 0.42725437
799 0.86126226]
800      -11132.275430121232
801
802      [0.24635886 0.28011463 0.08975852 0.08825556 0.01279468 0
    .42725437
803 0.86126226]
804 -11132.275430121232
805 -2947.9744643901795
806          [0.2459317 0.28000262 0.09109441 0.0891151 0.
    01266487 0.42736395
807 0.86237588]
808      -11132.19171757928
809
810      [0.2459317 0.28000262 0.09109441 0.0891151 0.01266487 0
    .42736395
811 0.86237588]
812 -11132.19171757928
813 -2947.8907518482283
814          [0.24675208 0.28058487 0.08965812 0.08820266 0.
    01241072 0.42737761
815 0.86343644]
816      -11132.12530333186
817
818      [0.24675208 0.28058487 0.08965812 0.08820266 0.01241072 0
    .42737761
819 0.86343644]
820 -11132.12530333186
821 -2947.8243376008086
822          [0.24604283 0.28022331 0.0914713 0.0895079 0.
    01227524 0.42747697
823 0.86449643]
824      -11132.0788357935
825
826      [0.24604283 0.28022331 0.0914713 0.0895079 0.01227524 0
    .42747697
827 0.86449643]
828 -11132.0788357935
```

```

829 -2947.7778700624476
830 [0.24709478 0.28100148 0.08942313 0.08798199 0.
     011995 0.42746957
831 0.86549866]
832 -11132.06166866058
833
834 [0.24709478 0.28100148 0.08942313 0.08798199 0.011995 0
     .42746957
835 0.86549866]
836 -11132.06166866058
837 -2947.7607029295286
838 [0.24602639 0.28028839 0.09192191 0.09002271 0.
     01189661 0.42759369
839 0.8665152 ]
840 -11132.081281063041
841 The 19 -th iteration of the EM(G) algorithm
842 [0.24709478 0.28100148 0.08942313 0.08798199 0.011995 0.
     42746957
843 0.86549866]
844 -11105.733936491955
845 -2947.3246442863892
846
847 M-step
848 [0.24709478 0.28100148 0.08942313 0.08798199 0.011995 0.
     42746957
849 0.86549866]
850 -11105.733936491955
851 -2947.3246442863892
852 [0.2579796 0.28904694 0.0738134 0.07947302 0.
     0110473 0.42976754
853 0.88205402]
854 -11143.029061640329
855 [0.25253719 0.28502421 0.08161826 0.0837275 0.
     01152115 0.42861855
856 0.87377634]
857 -11114.142751566606
858 [0.24981598 0.28301284 0.08552069 0.08585475 0.
     01175807 0.42804406
859 0.8696375 ]
860 -11107.35644778713
861 [0.24845538 0.28200716 0.08747191 0.08691837 0.
     01187653 0.42775681
862 0.86756808]
863 -11105.896962164828
864 [0.24777508 0.28150432 0.08844752 0.08745018 0.
     01193577 0.42761319
865 0.86653337]
866 -11105.653048598255
867
868 [0.24777508 0.28150432 0.08844752 0.08745018 0.01193577 0

```

```
868 .42761319
869 0.86653337]
870 -11105.653048598255
871 -2947.2437563926887
872 [0.24736491 0.28139052 0.08976286 0.08832119 0.
     0118363 0.42770585
873 0.86754262]
874 -11105.586861395539
875
876 [0.24736491 0.28139052 0.08976286 0.08832119 0.0118363 0
     .42770585
877 0.86754262]
878 -11105.586861395539
879 -2947.177569189973
880 [0.24816736 0.28197661 0.08835613 0.08739675 0.
     01161326 0.42770564
881 0.86850211]
882 -11105.536657519386
883
884 [0.24816736 0.28197661 0.08835613 0.08739675 0.01161326 0
     .42770564
885 0.86850211]
886 -11105.536657519386
887 -2947.1273653138196
888 [0.2474861 0.28161427 0.09013013 0.08871496 0.
     01150592 0.42779051
889 0.86946313]
890 -11105.504930568331
891
892 [0.2474861 0.28161427 0.09013013 0.08871496 0.01150592 0
     .42779051
893 0.86946313]
894 -11105.504930568331
895 -2947.0956383627654
896 [0.24850645 0.28239518 0.08813574 0.08717682 0.
     01125525 0.42777173
897 0.87036971]
898 -11105.500686723342
899 The 20 -th iteration of the EM(G) algorithm
900 [0.2474861 0.28161427 0.09013013 0.08871496 0.01150592 0.
     42779051
901 0.86946313]
902 -11111.419656791366
903 -2947.0519177069973
904
905 M-step
906 [0.2474861 0.28161427 0.09013013 0.08871496 0.01150592 0.
     42779051
907 0.86946313]
908 -11111.419656791366
```

909 -2947.0519177069973  
910 [0.25870397 0.289965 0.07378014 0.07942095 0.  
00735703 0.4274103  
911 0.88391284]  
912 -11153.426825315217  
913 [0.25309503 0.28578964 0.08195513 0.08406795 0.  
00943147 0.4276004  
914 0.87668799]  
915 -11121.019136074894  
916 [0.25029056 0.28370195 0.08604263 0.08639146 0.  
0104687 0.42769545  
917 0.87307556]  
918 -11113.343512890924  
919 [0.24888833 0.28265811 0.08808638 0.08755321 0.  
01098731 0.42774298  
920 0.87126935]  
921 -11111.659374383265  
922 [0.24818721 0.28213619 0.08910825 0.08813409 0.  
01124662 0.42776674  
923 0.87036624]  
924 -11111.358604126699  
925  
926 [0.24818721 0.28213619 0.08910825 0.08813409 0.01124662 0  
.42776674  
927 0.87036624]  
928 -11111.358604126699  
929 -2946.9908650423304  
930 [0.2477453 0.28199091 0.0904915 0.08908151 0.  
01110862 0.42783766  
931 0.87127067]  
932 -11111.310757425188  
933  
934 [0.2477453 0.28199091 0.0904915 0.08908151 0.01110862 0  
.42783766  
935 0.87127067]  
936 -11111.310757425188  
937 -2946.9430183408194  
938 [0.2485874 0.28261797 0.08900106 0.08805798 0.  
01087797 0.42784143  
939 0.87213253]  
940 -11111.280234488513  
941  
942 [0.2485874 0.28261797 0.08900106 0.08805798 0.01087797 0  
.42784143  
943 0.87213253]  
944 -11111.280234488513  
945 -2946.9124954041445  
946 [0.24785612 0.2822008 0.09088188 0.0895091 0.  
01077769 0.42793867  
947 0.87300116]

```
948          -11111.270645039167
949 The 21 -th iteration of the EM(G) algorithm
950 [0.2485874  0.28261797  0.08900106  0.08805798  0.01087797  0.
   42784143
951  0.87213253]
952 -11090.132600812358
953 -2946.6293291377406
954
955 M-step
956 [0.2485874  0.28261797  0.08900106  0.08805798  0.01087797  0.
   42784143
957  0.87213253]
958 -11090.132600812358
959 -2946.6293291377406
960          [0.25953196  0.29086724  0.07318782  0.07901352  0.
   0097502  0.42963463
961  0.88625049]
962          -11129.415059289206
963          [0.25405968  0.2867426   0.08109444  0.08353575  0.
   01031409  0.42873803
964  0.87919151]
965          -11099.112968736063
966          [0.25132354  0.28468029  0.08504775  0.08579686  0.
   01059603  0.42828973
967  0.87566202]
968          -11091.933616803175
969          [0.24995547  0.28364913  0.0870244   0.08692742  0.
   010737  0.42806558
970  0.87389728]
971          -11090.357840988521
972          [0.24927144  0.28313355  0.08801273  0.0874927   0.
   01080748  0.42795351
973  0.87301491]
974          -11090.076033379493
975
976          [0.24927144  0.28313355  0.08801273  0.0874927   0.01080748  0
   .42795351
977  0.87301491]
978 -11090.076033379493
979 -2946.572761704876
980          [0.24885789  0.28300244  0.0893463   0.08841042  0.
   010725  0.42803921
981  0.87388039]
982          -11090.032719371464
983
984          [0.24885789  0.28300244  0.0893463   0.08841042  0.010725  0
   .42803921
985  0.87388039]
986 -11090.032719371464
987 -2946.5294476968465
```

```

988 [0.24966764 0.28361263 0.08791762 0.0874246 0.
    01052427 0.42803637
989 0.87470105]
990 -11090.005245861848
991
992 [0.24966764 0.28361263 0.08791762 0.0874246 0.01052427
    0.42803637
993 0.87470105]
994 -11090.005245861848
995 -2946.501974187231
996 [0.24897968 0.28321949 0.08972025 0.08882482 0.
    01044201 0.42811942
997 0.87552743]
998 -11089.996673495709
999 The 22 -th iteration of the EM(G) algorithm
1000 [0.24966764 0.28361263 0.08791762 0.0874246 0.01052427 0
    .42803637
1001 0.87470105]
1002 -11069.072054029253
1003 -2946.2361337972243
1004
1005 M-step
1006 [0.24966764 0.28361263 0.08791762 0.0874246 0.01052427 0
    .42803637
1007 0.87470105]
1008 -11069.072054029253
1009 -2946.2361337972243
1010 [0.26042007 0.29183709 0.0724224 0.07839423 0.
    00966794 0.42959273
1011 0.88813599]
1012 -11107.173514114686
1013 [0.25504385 0.28772486 0.08017001 0.08290941 0.
    01009611 0.42881455
1014 0.88141852]
1015 -11077.798430714884
1016 [0.25235575 0.28566874 0.08404381 0.08516701 0.
    01031019 0.42842546
1017 0.87805978]
1018 -11070.831108815575
1019 [0.25101169 0.28464068 0.08598072 0.0862958 0.
    01041723 0.42823091
1020 0.87638041]
1021 -11069.297684412863
1022 [0.25033967 0.28412666 0.08694917 0.0868602 0.
    01047075 0.42813364
1023 0.87554073]
1024 -11069.02103834536
1025
1026 [0.25033967 0.28412666 0.08694917 0.0868602 0.01047075
    0.42813364

```

```

1027 0.87554073]
1028 -11069.02103834536
1029 -2946.1851181133306
1030 [0.24994371 0.28399874 0.0882552 0.08777467 0.
    01040433 0.42820636
1031 0.87636441]
1032 -11068.982548638256
1033
1034 [0.24994371 0.28399874 0.0882552 0.08777467 0.01040433
    0.42820636
1035 0.87636441]
1036 -11068.982548638256
1037 -2946.146628406227
1038 [0.25073313 0.28460528 0.08686345 0.08679489 0.
    01022066 0.42819335
1039 0.87714466]
1040 -11068.9589957455
1041
1042 [0.25073313 0.28460528 0.08686345 0.08679489 0.01022066
    0.42819335
1043 0.87714466]
1044 -11068.9589957455
1045 -2946.12307551347
1046 [0.2500742 0.28421954 0.08861782 0.08818491 0.
    01015234 0.42826555
1047 0.87793101]
1048 -11068.953166820267
1049 The 23 -th iteration of the EM(G) algorithm
1050 [0.25073313 0.28460528 0.08686345 0.08679489 0.01022066 0
    .42819335
1051 0.87714466]
1052 -11047.96863626418
1053 -2945.866929523684
1054
1055 M-step
1056 [0.25073313 0.28460528 0.08686345 0.08679489 0.01022066 0
    .42819335
1057 0.87714466]
1058 -11047.96863626418
1059 -2945.866929523684
1060 [0.26130035 0.29280265 0.07167599 0.0777831 0.
    00957462 0.42956907
1061 0.88993335]
1062 -11084.933597837999
1063 [0.25601674 0.28870397 0.07926972 0.082289 0.
    00989764 0.42888121
1064 0.88353901]
1065 -11056.448546157326
1066 [0.25337493 0.28665463 0.08306658 0.08454194 0.
    01005915 0.42853728

```

```
1067 0.88034183]
1068      -11049.685765844599
1069      [0.25205403 0.28562996 0.08496502 0.08566842 0.
1070      01013991 0.42836532
1071 0.87874325]
1072      -11048.193737788208
1073      [0.25139358 0.28511762 0.08591423 0.08623166 0.
1074      01018029 0.42827934
1075 0.87794395]
1076      -11047.922477846363
1077 0.87794395]
1078 -11047.922477846363
1079 -2945.8207711058667
1080      [0.25101438 0.28499295 0.08719346 0.08714246 0.
1081      01012654 0.42834225
1082 0.87872815]
1083      -11047.88816483408
1084 0.87872815]
1085      [0.25101438 0.28499295 0.08719346 0.08714246 0.01012654
1086 -11047.88816483408
1087 -2945.786458093583
1088      [0.25178424 0.28559565 0.08583768 0.08616931 0.
1089      00995692 0.42832194
1090 0.87947029]
1091      -11047.867941557302
1092 0.87947029]
1093      [0.25178424 0.28559565 0.08583768 0.08616931 0.00995692
1094 -11047.867941557302
1095 -2945.766234816806
1096      [0.25115314 0.28521748 0.08754493 0.08754831 0.
1097      00989971 0.42838578
1098 0.88021889]
1099      -11047.86433455319
1100 The 24 -th iteration of the EM(G) algorithm
1101 [0.25178424 0.28559565 0.08583768 0.08616931 0.00995692 0
1102      .42832194
1103 0.87947029]
1104 -11026.837284303632
1105 -2945.5194134076073
1106 M-step
1107 [0.25178424 0.28559565 0.08583768 0.08616931 0.00995692 0
1108      .42832194
```

```
1107 0.87947029]
1108 -11026.837284303632
1109 -2945.5194134076073
1110 [0.26217227 0.29376322 0.07094927 0.07718171 0.
     00947632 0.42955738
1111 0.89164949]
1112 -11062.701577424474
1113 [0.25697825 0.28967943 0.07839348 0.08167551 0.
     00971662 0.42893966
1114 0.88555989]
1115 -11035.076628173032
1116 [0.25438125 0.28763754 0.08211558 0.08392241 0.
     00983677 0.4286308
1117 0.88251509]
1118 -11028.5124000624
1119 [0.25308275 0.28661659 0.08397663 0.08504586 0.
     00989684 0.42847637
1120 0.88099269]
1121 -11027.061048560096
1122 [0.25243349 0.28610612 0.08490716 0.08560758 0.
     00992688 0.42839915
1123 0.88023149]
1124 -11026.79538738415
1125
1126 [0.25243349 0.28610612 0.08490716 0.08560758 0.00992688
     0.42839915
1127 0.88023149]
1128 -11026.79538738415
1129 -2945.4775164881257
1130 [0.25207031 0.28598481 0.0861602 0.08651421 0.
     00988331 0.42845455
1131 0.88097849]
1132 -11026.764695752514
1133
1134 [0.25207031 0.28598481 0.0861602 0.08651421 0.00988331
     0.42845455
1135 0.88097849]
1136 -11026.764695752514
1137 -2945.446824856489
1138 [0.25282131 0.2865834 0.08483954 0.08554836 0.
     00972547 0.42842896
1139 0.88168478]
1140 -11026.747296343085
1141
1142 [0.25282131 0.2865834 0.08483954 0.08554836 0.00972547
     0.42842896
1143 0.88168478]
1144 -11026.747296343085
1145 -2945.4294254470597
1146 [0.25221692 0.28621305 0.08650074 0.08691542 0.
```

```
1146 00967729 0.42848627
1147 0.88239787]
1148 -11026.745466418708
1149 The 25 -th iteration of the EM(G) algorithm
1150 [0.25282131 0.2865834 0.08483954 0.08554836 0.00972547 0
.42842896
1151 0.88168478]
1152 -11005.69417197331
1153 -2945.191609585905
1154
1155 M-step
1156 [0.25282131 0.2865834 0.08483954 0.08554836 0.00972547 0
.42842896
1157 0.88168478]
1158 -11005.69417197331
1159 -2945.191609585905
1160 [0.26303563 0.29471843 0.07024264 0.07659121 0.
00937695 0.42955323
1161 0.89329031]
1162 -11040.488090520188
1163 [0.25792847 0.29065092 0.07754109 0.08106979 0.
00955121 0.42899109
1164 0.88748755]
1165 -11013.69787816011
1166 [0.25537489 0.28861716 0.08119031 0.08330907 0.
00963834 0.42871003
1167 0.88458616]
1168 -11007.327154795898
1169 [0.2540981 0.28760028 0.08301493 0.08442872 0.
00968191 0.42856949
1170 0.88313547]
1171 -11005.915890073707
1172 [0.25345971 0.28709184 0.08392723 0.08498854 0.
00970369 0.42849923
1173 0.88241012]
1174 -11005.656019340502
1175
1176 [0.25345971 0.28709184 0.08392723 0.08498854 0.00970369
0.42849923
1177 0.88241012]
1178 -11005.656019340502
1179 -2945.1534569530977
1180 [0.25311185 0.28697401 0.08515465 0.08589045 0.
00966842 0.42854876
1181 0.88312213]
1182 -11005.628469305128
1183
1184 [0.25311185 0.28697401 0.08515465 0.08589045 0.00966842
0.42854876
1185 0.88312213]
```

```

1186 -11005.628469305128
1187 -2945.125906917723
1188 [0.25384465 0.28756824 0.08386832 0.08493262 0.
      00952065 0.42851935
1189 0.88379474]
1190 -11005.613458082536
1191
1192 [0.25384465 0.28756824 0.08386832 0.08493262 0.00952065
      0.42851935
1193 0.88379474]
1194 -11005.613458082536
1195 -2945.110895695132
1196 [0.25326595 0.28720597 0.08548446 0.08628677 0.
      0094799 0.42857143
1197 0.88447446]
1198 -11005.613027837508
1199 The 26 -th iteration of the EM(G) algorithm
1200 [0.25384465 0.28756824 0.08386832 0.08493262 0.00952065 0
      .42851935
1201 0.88379474]
1202 -10984.556058300695
1203 -2944.8817994429246
1204
1205 M-step
1206 [0.25384465 0.28756824 0.08386832 0.08493262 0.00952065 0
      .42851935
1207 0.88379474]
1208 -10984.556058300695
1209 -2944.8817994429246
1210 [0.26389031 0.29566804 0.06955595 0.07601221 0.
      00927897 0.42955355
1211 0.89486093]
1212 -11018.307241674387
1213 [0.25886748 0.29161814 0.07671213 0.08047242 0.
      00939981 0.42903645
1214 0.88932784]
1215 -10992.328717087947
1216 [0.25635607 0.28959319 0.08029023 0.08270252 0.
      00946023 0.4287779
1217 0.88656129]
1218 -10986.146870525521
1219 [0.25510036 0.28858072 0.08207927 0.08381757 0.
      00949044 0.42864863
1220 0.88517801]
1221 -10984.775125095148
1222 [0.2544725 0.28807448 0.0829738 0.08437509 0.
      00950555 0.42858399
1223 0.88448638]
1224 -10984.521200413881
1225

```

```

1226 [0.2544725 0.28807448 0.0829738 0.08437509 0.00950555
      0.42858399
1227 0.88448638]
1228 -10984.521200413881
1229 -2944.8469415561103
1230 [0.25413934 0.28796026 0.08417611 0.08527174 0.
      00947716 0.42862885
1231 0.8851655 ]
1232 -10984.496376124962
1233
1234 [0.25413934 0.28796026 0.08417611 0.08527174 0.00947716
      0.42862885
1235 0.8851655 ]
1236 -10984.496376124962
1237 -2944.822117267191
1238 [0.25485455 0.28854986 0.08292335 0.08432263 0.
      00933815 0.42859669
1239 0.88580649]
1240 -10984.483379275094
1241
1242 [0.25485455 0.28854986 0.08292335 0.08432263 0.00933815
      0.42859669
1243 0.88580649]
1244 -10984.483379275094
1245 -2944.8091204173234
1246 [0.25430054 0.28819592 0.08449542 0.08566294 0.
      00930359 0.42864449
1247 0.88645486]
1248 -10984.48402880162
1249 The 27 -th iteration of the EM(G) algorithm
1250 [0.25485455 0.28854986 0.08292335 0.08432263 0.00933815 0
      .42859669
1251 0.88580649]
1252 -10963.439619867158
1253 -2944.5884739079056
1254
1255 M-step
1256 [0.25485455 0.28854986 0.08292335 0.08432263 0.00933815 0
      .42859669
1257 0.88580649]
1258 -10963.439619867158
1259 -2944.5884739079056
1260 [0.26473627 0.29661189 0.06888904 0.07544504 0.
      00918399 0.42955635
1261 0.89636589]
1262 -10996.17406584058
1263 [0.25979541 0.29258088 0.0759062 0.07988384 0.
      00926107 0.42907652
1264 0.89108619]
1265 -10970.985675965154

```

```
1266 [0.25732498 0.29056537 0.07941477 0.08210323 0.  
00929961 0.42883661  
1267 0.88844634]  
1268 -10964.9883221836  
1269 [0.25608976 0.28955762 0.08116906 0.08321293 0.  
00931888 0.42871665  
1270 0.88712642]  
1271 -10963.6555224519  
1272 [0.25547215 0.28905374 0.08204621 0.08376778 0.  
00932851 0.42865667  
1273 0.88646646]  
1274 -10963.407664112045  
1275  
1276 [0.25547215 0.28905374 0.08204621 0.08376778 0.00932851  
0.42865667  
1277 0.88646646]  
1278 -10963.407664112045  
1279 -2944.556518152792  
1280 [0.2551531 0.28894325 0.08322392 0.08465864 0.  
00930589 0.42869774  
1281 0.88711468]  
1282 -10963.38520558635  
1283  
1284 [0.2551531 0.28894325 0.08322392 0.08465864 0.00930589  
0.42869774  
1285 0.88711468]  
1286 -10963.38520558635  
1287 -2944.534059627097  
1288 [0.25585128 0.289528 0.08200399 0.08371893 0.  
0091746 0.4286636  
1289 0.88772601]  
1290 -10963.373902514824  
1291  
1292 [0.25585128 0.289528 0.08200399 0.08371893 0.0091746  
0.4286636  
1293 0.88772601]  
1294 -10963.373902514824  
1295 -2944.5227565555715  
1296 [0.25532104 0.28918259 0.08353298 0.08504451 0.  
00914529 0.42870784  
1297 0.88834493]  
1298 -10963.375363478453  
1299 The 28 -th iteration of the EM(G) algorithm  
1300 [0.25585128 0.289528 0.08200399 0.08371893 0.0091746 0  
.4286636  
1301 0.88772601]  
1302 -10942.361015229242  
1303 -2944.310297142165  
1304  
1305 M-step
```

```
1306 [0.25585128 0.289528 0.08200399 0.08371893 0.0091746 0  
.4286636  
1307 0.88772601]  
1308 -10942.361015229242  
1309 -2944.310297142165  
1310 [0.26557363 0.29754993 0.06824154 0.07488989 0.  
00909294 0.42956027  
1311 0.89780922]  
1312 -10974.10411008084  
1313 [0.26071246 0.29353896 0.07512276 0.07930441 0.  
00913377 0.42911194  
1314 0.89276761]  
1315 -10949.684980066331  
1316 [0.25828187 0.29153348 0.07856337 0.08151167 0.  
00915419 0.42888777  
1317 0.89024681]  
1318 -10943.86779595523  
1319 [0.25706658 0.29053074 0.08028368 0.0826153 0.  
0091644 0.42877569  
1320 0.88898641]  
1321 -10942.57332822294  
1322 [0.25645893 0.29002937 0.08114383 0.08316711 0.  
0091695 0.42871964  
1323 0.88835621]  
1324 -10942.331618696988  
1325  
1326 [0.25645893 0.29002937 0.08114383 0.08316711 0.0091695  
0.42871964  
1327 0.88835621]  
1328 -10942.331618696988  
1329 -2944.2809006099105  
1330 [0.25615341 0.28992271 0.08229744 0.08405169 0.  
00915177 0.42875758  
1331 0.88897541]  
1332 -10942.311213510227  
1333  
1334 [0.25615341 0.28992271 0.08229744 0.08405169 0.00915177  
0.42875758  
1335 0.88897541]  
1336 -10942.311213510227  
1337 -2944.26049542315  
1338 [0.25683514 0.2905024 0.08110959 0.08312198 0.  
00902739 0.42872203  
1339 0.88955889]  
1340 -10942.301329097798  
1341 The 29 -th iteration of the EM(G) algorithm  
1342 [0.25615341 0.28992271 0.08229744 0.08405169 0.00915177 0  
.42875758  
1343 0.88897541]  
1344 -10944.524064560384
```

```
1345 -2944.254086306586
1346
1347 M-step
1348 [0.25615341 0.28992271 0.08229744 0.08405169 0.00915177 0
     .42875758
1349 0.88897541]
1350 -10944.524064560384
1351 -2944.254086306586
1352      [0.26598917 0.29805482 0.06824406 0.07490829 0.
     00712264 0.42816595
1353 0.89829589]
1354      -10977.952946182462
1355      [0.26107129 0.29398876 0.07527075 0.07947999 0.
     00813721 0.42846176
1356 0.89363565]
1357      -10952.264731772802
1358      [0.25861235 0.29195574 0.07878409 0.08176584 0.
     00864449 0.42860967
1359 0.89130553]
1360      -10946.131467781945
1361      [0.25738288 0.29093922 0.08054076 0.08290876 0.
     00889813 0.42868362
1362 0.89014047]
1363      -10944.759481352467
1364      [0.25676815 0.29043096 0.0814191 0.08348022 0.
     00902495 0.4287206
1365 0.88955794]
1366      -10944.499422634706
1367
1368      [0.25676815 0.29043096 0.0814191 0.08348022 0.00902495
     0.4287206
1369 0.88955794]
1370 -10944.499422634706
1371 -2944.229444380908
1372      [0.25645046 0.29031151 0.08260043 0.08439668 0.
     00897951 0.42874925
1373 0.89014358]
1374      -10944.48309935426
1375
1376      [0.25645046 0.29031151 0.08260043 0.08439668 0.00897951
     0.42874925
1377 0.89014358]
1378 -10944.48309935426
1379 -2944.2131211004616
1380      [0.25714694 0.29090749 0.08137877 0.0834255 0.
     00884522 0.42871865
1381 0.89069673]
1382      -10944.47784568886
1383 The 30 -th iteration of the EM(G) algorithm
1384 [0.25645046 0.29031151 0.08260043 0.08439668 0.00897951 0
```

```
1384 .42874925
1385 0.89014358]
1386 -10946.924697356833
1387 -2944.205972027795
1388
1389 M-step
1390 [0.25645046 0.29031151 0.08260043 0.08439668 0.00897951 0
     .42874925
1391 0.89014358]
1392 -10946.924697356833
1393 -2944.205972027795
1394      [0.2663553 0.29850742 0.06838671 0.07508397 0.
     00678609 0.42823443
1395 0.89897569]
1396      -10981.280088903593
1397      [0.26140288 0.29440946 0.07549357 0.07974033 0.
     0078828 0.42849184
1398 0.89455964]
1399      -10954.8966236552
1400      [0.25892667 0.29236049 0.079047 0.0820685 0.
     00843116 0.42862055
1401 0.89235161]
1402      -10948.589023138404
1403      [0.25768856 0.291336 0.08082371 0.08323259 0.
     00870533 0.4286849
1404 0.8912476 ]
1405      -10947.173812166433
1406      [0.25706951 0.29082375 0.08171207 0.08381463 0.
     00884242 0.42871708
1407 0.89069559]
1408      -10946.903202277921
1409
1410      [0.25706951 0.29082375 0.08171207 0.08381463 0.00884242
     0.42871708
1411 0.89069559]
1412 -10946.903202277921
1413 -2944.1844769488825
1414      [0.25674538 0.29069781 0.08290785 0.08474697 0.
     00879251 0.42875348
1415 0.89125234]
1416      -10946.890207402259
1417
1418      [0.25674538 0.29069781 0.08290785 0.08474697 0.00879251
     0.42875348
1419 0.89125234]
1420 -10946.890207402259
1421 -2944.1714820732204
1422      [0.25745031 0.29130257 0.08166656 0.08375294 0.
     00865503 0.42872992
1423 0.89177753]
```

```
1424          -10946.888683548688
1425 The 31 -th iteration of the EM(G) algorithm
1426 [0.25674538 0.29069781 0.08290785 0.08474697 0.00879251 0
     .42875348
1427 0.89125234]
1428 -10949.41438885577
1429 -2944.1639944836443
1430
1431 M-step
1432 [0.25674538 0.29069781 0.08290785 0.08474697 0.00879251 0
     .42875348
1433 0.89125234]
1434 -10949.41438885577
1435 -2944.1639944836443
1436          [0.26671429 0.29895228 0.06854632 0.07527921 0.
     00654613 0.42835067
1437 0.89963613]
1438          -10984.62410124287
1439          [0.26172983 0.29482505 0.07572709 0.08001309 0.
     00766932 0.42855207
1440 0.89544423]
1441          -10957.5995600651
1442          [0.25923761 0.29276143 0.07931747 0.08238003 0.
     00823092 0.42865277
1443 0.89334829]
1444          -10951.131146549254
1445          [0.25799149 0.29172962 0.08111266 0.0835635 0.
     00851172 0.42870312
1446 0.89230031]
1447          -10949.676084398921
1448          [0.25736843 0.29121372 0.08201026 0.08415523 0.
     00865211 0.4287283
1449 0.89177633]
1450          -10949.395764155446
1451
1452          [0.25736843 0.29121372 0.08201026 0.08415523 0.00865211
     0.4287283
1453 0.89177633]
1454 -10949.395764155446
1455 -2944.1453697833203
1456          [0.25703827 0.29108176 0.08321945 0.08510219 0.
     00860044 0.42877121
1457 0.89230602]
1458          -10949.385835200002
1459 The 32 -th iteration of the EM(G) algorithm
1460 [0.25736843 0.29121372 0.08201026 0.08415523 0.00865211 0
     .4287283
1461 0.89177633]
1462 -10932.265834740778
1463 -2943.997936773553
```

```
1464
1465 M-step
1466 [0.25736843 0.29121372 0.08201026 0.08415523 0.00865211 0
     .4287283
1467 0.89177633]
1468 -10932.265834740778
1469 -2943.997936773553
1470      [0.26712024 0.29935807 0.06809619 0.07495233 0.
     00813135 0.42956529
1471 0.90039281]
1472      -10965.311878251245
1473      [0.26224434 0.29528589 0.07505322 0.07955378 0.
     00839173 0.4291468
1474 0.89608457]
1475      -10939.93637371679
1476      [0.25980639 0.2932498 0.07853174 0.08185451 0.
     00852192 0.42893755
1477 0.89393045]
1478      -10933.868245336293
1479      [0.25858741 0.29223176 0.080271 0.08300487 0.
     00858702 0.42883292
1480 0.89285339]
1481      -10932.506415775297
1482      [0.25797792 0.29172274 0.08114063 0.08358005 0.
     00861957 0.42878061
1483 0.89231486]
1484      -10932.245665909237
1485
1486      [0.25797792 0.29172274 0.08114063 0.08358005 0.00861957
     0.42878061
1487 0.89231486]
1488 -10932.245665909237
1489 -2943.977767942012
1490      [0.257668 0.29160291 0.08230871 0.08449892 0.
     00859587 0.42882987
1491 0.89284789]
1492      -10932.234151757775
1493
1494      [0.257668 0.29160291 0.08230871 0.08449892 0.00859587
     0.42882987
1495 0.89284789]
1496 -10932.234151757775
1497 -2943.9662537905506
1498      [0.25835633 0.29220028 0.08110061 0.08352061 0.
     00847077 0.42880672
1499 0.89334828]
1500      -10932.23359770104
1501 The 33 -th iteration of the EM(G) algorithm
1502 [0.257668 0.29160291 0.08230871 0.08449892 0.00859587 0
     .42882987
```

```
1503 0.89284789]
1504 -10934.640964983344
1505 -2943.9592891126395
1506
1507 M-step
1508 [0.257668 0.29160291 0.08230871 0.08449892 0.00859587 0
     .42882987
1509 0.89284789]
1510 -10934.640964983344
1511 -2943.9592891126395
1512 [0.26751387 0.2998382 0.06815187 0.07503453 0.
     00655186 0.42843546
1513 0.90083692]
1514 -10969.150268822705
1515 [0.26259094 0.29572055 0.07523029 0.07976672 0.
     00757386 0.42863267
1516 0.8968424 ]
1517 -10942.669819357156
1518 [0.26012947 0.29366173 0.0787695 0.08213282 0.
     00808486 0.42873127
1519 0.89484515]
1520 -10936.328485911192
1521 [0.25889874 0.29263232 0.08053911 0.08331587 0.
     00834037 0.42878057
1522 0.89384652]
1523 -10934.90033093077
1524 [0.25828337 0.29211762 0.08142391 0.08390739 0.
     00846812 0.42880522
1525 0.89334721]
1526 -10934.624254251998
1527
1528 [0.25828337 0.29211762 0.08142391 0.08390739 0.00846812
     0.42880522
1529 0.89334721]
1530 -10934.624254251998
1531 -2943.942578381293
1532 [0.25796314 0.29198698 0.0826154 0.08485307 0.
     00842415 0.42884483
1533 0.89385207]
1534 -10934.61596364243
1535 The 34 -th iteration of the EM(G) algorithm
1536 [0.25828337 0.29211762 0.08142391 0.08390739 0.00846812 0
     .42880522
1537 0.89334721]
1538 -10917.468018925474
1539 -2943.7980976966683
1540
1541 M-step
1542 [0.25828337 0.29211762 0.08142391 0.08390739 0.00846812 0
     .42880522
```

```

1543 0.89334721]
1544 -10917.468018925474
1545 -2943.7980976966683
1546 [0.26791801 0.3002447 0.06770297 0.07470218 0.
    00806516 0.42958624
1547 0.90156409]
1548 -10949.898754556705
1549 [0.26310069 0.29618116 0.07456344 0.07930479 0.
    00826664 0.42919573
1550 0.89745565]
1551 -10925.001964001016
1552 [0.26069203 0.29414939 0.07799368 0.08160609 0.
    00836738 0.42900048
1553 0.89540143]
1554 -10919.045361918445
1555 [0.2594877 0.2931335 0.07970879 0.08275674 0.
    00841775 0.42890285
1556 0.89437432]
1557 -10917.706929986898
1558 [0.25888554 0.29262556 0.08056635 0.08333207 0.
    00844293 0.42885404
1559 0.89386076]
1560 -10917.44973815519
1561
1562 [0.25888554 0.29262556 0.08056635 0.08333207 0.00844293
    0.42885404
1563 0.89386076]
1564 -10917.44973815519
1565 -2943.7798169263842
1566 [0.25858487 0.29250673 0.08171779 0.0842503 0.
    00842543 0.42889944
1567 0.89436922]
1568 -10917.4398679158
1569 The 35 -th iteration of the EM(G) algorithm
1570 [0.25888554 0.29262556 0.08056635 0.08333207 0.00844293 0
    .42885404
1571 0.89386076]
1572 -10900.502353914391
1573 -2943.643144748863
1574
1575 M-step
1576 [0.25888554 0.29262556 0.08056635 0.08333207 0.00844293 0
    .42885404
1577 0.89386076]
1578 -10900.502353914391
1579 -2943.643144748863
1580 [0.26834506 0.30067688 0.06718343 0.0742863 0.
    00845611 0.42972406
1581 0.90213177]
1582 -10931.523588629174

```

```

1583      [0.2636153 0.29665122 0.07387489 0.07880919 0.
          00844952 0.42928905
1584 0.89799626]
1585      -10907.700229728489
1586      [0.26125042 0.29463839 0.07722062 0.08107063 0.
          00844623 0.42907154
1587 0.89592851]
1588      -10902.005181962088
1589      [0.26006798 0.29363197 0.07889349 0.08220135 0.
          00844458 0.42896279
1590 0.89489464]
1591      -10900.727510953158
1592      [0.25947676 0.29312877 0.07972992 0.08276671 0.
          00844375 0.42890841
1593 0.8943777 ]
1594      -10900.483090389896
1595
1596      [0.25947676 0.29312877 0.07972992 0.08276671 0.00844375
          0.42890841
1597 0.8943777 ]
1598 -10900.483090389896
1599 -2943.6238812243682
1600      [0.25919109 0.29301727 0.08085123 0.08366863 0.
          00843658 0.42894733
1601 0.89488717]
1602      -10900.472083396346
1603
1604      [0.25919109 0.29301727 0.08085123 0.08366863 0.00843658
          0.42894733
1605 0.89488717]
1606 -10900.472083396346
1607 -2943.6128742308174
1608      [0.2598495 0.29360351 0.07970369 0.08271405 0.
          00832709 0.42891485
1609 0.8953646 ]
1610      -10900.471067038723
1611 The 36 -th iteration of the EM(G) algorithm
1612 [0.25919109 0.29301727 0.08085123 0.08366863 0.00843658 0
          .42894733
1613 0.89488717]
1614 -10902.791766671731
1615 -2943.6065074125527
1616
1617 M-step
1618 [0.25919109 0.29301727 0.08085123 0.08366863 0.00843658 0
          .42894733
1619 0.89488717]
1620 -10902.791766671731
1621 -2943.6065074125527
1622      [0.26874643 0.30116307 0.06721438 0.07434663 0.

```

```

1622 00664643 0.42840577
1623 0.90251084]
1624 -10935.279423426313
1625 [0.26396876 0.29709017 0.0740328 0.07900763 0.
0075415 0.42867655
1626 0.89869901]
1627 -10910.349546502135
1628 [0.26157992 0.29505372 0.07744201 0.08133813 0.
00798904 0.42881194
1629 0.89679309]
1630 -10904.380229088683
1631 [0.26038551 0.29403549 0.07914662 0.08250338 0.
00821281 0.42887963
1632 0.89584013]
1633 -10903.03591951241
1634 [0.2597883 0.29352638 0.07999892 0.083086 0.
00832469 0.42891348
1635 0.89536365]
1636 -10902.776051227225
1637
1638 [0.2597883 0.29352638 0.07999892 0.083086 0.00832469
0.42891348
1639 0.89536365]
1640 -10902.776051227225
1641 -2943.5907919680467
1642 [0.25949196 0.29340347 0.08114477 0.08401642 0.
00829242 0.42894249
1643 0.89584546]
1644 -10902.768083189554
1645 The 37 -th iteration of the EM(G) algorithm
1646 [0.2597883 0.29352638 0.07999892 0.083086 0.00832469 0
.42891348
1647 0.89536365]
1648 -10885.6763452083
1649 -2943.454756787959
1650
1651 M-step
1652 [0.2597883 0.29352638 0.07999892 0.083086 0.00832469 0
.42891348
1653 0.89536365]
1654 -10885.6763452083
1655 -2943.454756787959
1656 [0.26914445 0.30156786 0.06677678 0.07401412 0.
00809688 0.42951889
1657 0.90320629]
1658 -10916.242153718435
1659 [0.26446637 0.29754712 0.07338785 0.07855006 0.
00821079 0.42921619
1660 0.89928497]
1661 -10892.77626526511

```

```

1662      [0.26212734 0.29553675 0.07669339 0.08081803 0.
00826774 0.42906483
1663 0.89732431]
1664      -10887.162764720917
1665      [0.26095782 0.29453156 0.07834616 0.08195202 0.
00829622 0.42898916
1666 0.89634398]
1667      -10885.901498098345
1668      [0.26037306 0.29402897 0.07917254 0.08251901 0.
00831046 0.42895132
1669 0.89585381]
1670      -10885.659133940335
1671
1672      [0.26037306 0.29402897 0.07917254 0.08251901 0.00831046
0.42895132
1673 0.89585381]
1674 -10885.659133940335
1675 -2943.4375455199943
1676      [0.260095    0.29391737 0.08028024 0.08342292 0.
00830253 0.42898674
1677 0.89633905]
1678      -10885.649693875584
1679 The 38 -th iteration of the EM(G) algorithm
1680 [0.26037306 0.29402897 0.07917254 0.08251901 0.00831046 0
.42895132
1681 0.89585381]
1682 -10868.772259476045
1683 -2943.3087349070847
1684
1685 M-step
1686 [0.26037306 0.29402897 0.07917254 0.08251901 0.00831046 0
.42895132
1687 0.89585381]
1688 -10868.772259476045
1689 -2943.3087349070847
1690      [0.26956418 0.30199687 0.06627143 0.07360225 0.
0084653 0.42965561
1691 0.90374816]
1692      -10898.034336780223
1693      [0.26496862 0.29801292 0.07272198 0.07806063 0.
00838788 0.42930346
1694 0.89980099]
1695      -10875.561257396965
1696      [0.26267084 0.29602095 0.07594726 0.08028982 0.
00834917 0.42912739
1697 0.8978274 ]
1698      -10870.189692424548
1699      [0.26152195 0.29502496 0.0775599 0.08140441 0.
00832981 0.42903936
1700 0.89684061]

```

```

1701      -10868.984649646427
1702      [0.2609475  0.29452697 0.07836622 0.08196171 0.
00832013 0.42899534
1703 0.89634721]
1704      -10868.75411630718
1705
1706 [0.2609475  0.29452697 0.07836622 0.08196171 0.00832013
0.42899534
1707 0.89634721]
1708 -10868.75411630718
1709 -2943.2905917382195
1710      [0.26068342 0.29442242 0.07944527 0.08284973 0.
00832124 0.42902534
1711 0.89683344]
1712      -10868.74361231524
1713
1714 [0.26068342 0.29442242 0.07944527 0.08284973 0.00832124
0.42902534
1715 0.89683344]
1716 -10868.74361231524
1717 -2943.2800877462796
1718      [0.26131486 0.29499907 0.07835281 0.08191531 0.
00822245 0.42898705
1719 0.89728869]
1720      -10868.742251609117
1721 The 39 -th iteration of the EM(G) algorithm
1722 [0.26068342 0.29442242 0.07944527 0.08284973 0.00832124 0
.42902534
1723 0.89683344]
1724 -10870.997979683372
1725 -2943.2741925412347
1726
1727 M-step
1728 [0.26068342 0.29442242 0.07944527 0.08284973 0.00832124 0
.42902534
1729 0.89683344]
1730 -10870.997979683372
1731 -2943.2741925412347
1732      [0.26996506 0.30248081 0.0663009 0.07366621 0.
00670542 0.42839244
1733 0.90410362]
1734      -10901.628224939313
1735      [0.26532424 0.29845161 0.07287309 0.07825797 0.
00751333 0.42870889
1736 0.90046853]
1737      -10878.12270778096
1738      [0.26300383 0.29643702 0.07615918 0.08055385 0.
00791729 0.42886712
1739 0.89865098]
1740      -10872.495246549768

```

```

1741 [0.26184363 0.29542972 0.07780222 0.08170179 0.
     00811927 0.42894623
1742 0.89774221]
1743 -10871.228048422314
1744 [0.26126353 0.29492607 0.07862375 0.08227576 0.
     00822025 0.42898579
1745 0.89728783]
1746 -10870.983121448899
1747
1748 [0.26126353 0.29492607 0.07862375 0.08227576 0.00822025
     0.42898579
1749 0.89728783]
1750 -10870.983121448899
1751 -2943.259334306761
1752 [0.26098935 0.29481057 0.07972624 0.08319127 0.
     00819579 0.42900785
1753 0.89774749]
1754 -10870.975400288382
1755 The 40 -th iteration of the EM(G) algorithm
1756 [0.26126353 0.29492607 0.07862375 0.08227576 0.00822025 0
     .42898579
1757 0.89728783]
1758 -10853.951226501234
1759 -2943.1310718725626
1760
1761 M-step
1762 [0.26126353 0.29492607 0.07862375 0.08227576 0.00822025 0
     .42898579
1763 0.89728783]
1764 -10853.951226501234
1765 -2943.1310718725626
1766 [0.27035666 0.30288333 0.06587521 0.07333508 0.
     00810616 0.42947421
1767 0.90477095]
1768 -10882.794517256549
1769 [0.26581009 0.2989047 0.07224948 0.07780542 0.
     00816321 0.42923
1770 0.90102939]
1771 -10860.650115609324
1772 [0.26353681 0.29691538 0.07543661 0.08004059 0.
     00819173 0.42910789
1773 0.89915861]
1774 -10855.353531454253
1775 [0.26240017 0.29592073 0.07703018 0.08115818 0.
     00820599 0.42904684
1776 0.89822322]
1777 -10854.163586967989
1778 [0.26183185 0.2954234 0.07782696 0.08171697 0.
     00821312 0.42901631
1779 0.89775552]

```

```
1780          -10853.934955861361
1781
1782 [0.26183185 0.2954234 0.07782696 0.08171697 0.00821312
     0.42901631
1783 0.89775552]
1784 -10853.934955861361
1785 -2943.1148012326894
1786 [0.26157482 0.29531878 0.07889302 0.08260674 0.
     0082115 0.42904513
1787 0.89821855]
1788 -10853.925868205179
1789 The 41 -th iteration of the EM(G) algorithm
1790 [0.26183185 0.2954234 0.07782696 0.08171697 0.00821312 0
     .42901631
1791 0.89775552]
1792 -10837.120562527938
1793 -2942.993253925568
1794
1795 M-step
1796 [0.26183185 0.2954234 0.07782696 0.08171697 0.00821312 0
     .42901631
1797 0.89775552]
1798 -10837.120562527938
1799 -2942.993253925568
1800 [0.27076907 0.30330888 0.06538407 0.0729281 0.
     0084578 0.42960938
1801 0.90528957]
1802 -10864.753069090573
1803 [0.26630046 0.29936614 0.07160552 0.07732253 0.
     00833546 0.42931285
1804 0.90152254]
1805 -10843.530661290117
1806 [0.26406615 0.29739477 0.07471624 0.07951975 0.
     00827429 0.42916458
1807 0.89963903]
1808 -10838.45876319631
1809 [0.262949 0.29640908 0.0762716 0.08061836 0.
     00824371 0.42909045
1810 0.89869728]
1811 -10837.321045437346
1812 [0.26239042 0.29591624 0.07704928 0.08116767 0.
     00822842 0.42905338
1813 0.8982264 ]
1814 -10837.103412184802
1815
1816 [0.26239042 0.29591624 0.07704928 0.08116767 0.00822842
     0.42905338
1817 0.8982264 ]
1818 -10837.103412184802
1819 -2942.976103582432
```

```

1820      [0.26214646 0.29581845 0.07808806 0.08204188 0.
00823495 0.42907752
1821 0.89869046]
1822      -10837.093332792761
1823
1824  [0.26214646 0.29581845 0.07808806 0.08204188 0.00823495
0.42907752
1825 0.89869046]
1826 -10837.093332792761
1827 -2942.966024190391
1828      [0.26275255 0.29638565 0.07704794 0.0811275 0.
00814425 0.42903606
1829 0.89912463]
1830      -10837.091627469466
1831 The 42 -th iteration of the EM(G) algorithm
1832 [0.26214646 0.29581845 0.07808806 0.08204188 0.00823495 0
.42907752
1833 0.89869046]
1834 -10839.278458217083
1835 -2942.9605573116014
1836
1837 M-step
1838 [0.26214646 0.29581845 0.07808806 0.08204188 0.00823495 0
.42907752
1839 0.89869046]
1840 -10839.278458217083
1841 -2942.9605573116014
1842      [0.27116881 0.30379021 0.0654132 0.07299656 0.
00675161 0.42839558
1843 0.90562459]
1844      -10868.182864393228
1845      [0.26665763 0.29980433 0.07175063 0.07751922 0.
00749328 0.42873655
1846 0.90215753]
1847      -10846.000601784806
1848      [0.26440204 0.29781139 0.07491934 0.07978055 0.
00786412 0.42890703
1849 0.90042399]
1850      -10840.69082135032
1851      [0.26327425 0.29681492 0.0765037 0.08091121 0.
00804953 0.42899227
1852 0.89955723]
1853      -10839.495339405388
1854      [0.26271035 0.29631668 0.07729588 0.08147655 0.
00814224 0.4290349
1855 0.89912385]
1856      -10839.264341424569
1857
1858  [0.26271035 0.29631668 0.07729588 0.08147655 0.00814224
0.4290349

```

```
1859 0.89912385]
1860 -10839.264341424569
1861 -2942.9464405190874
1862 [0.26245687 0.29620842 0.07835696 0.08237716 0.
    00812325 0.42905237
1863 0.89956248]
1864 -10839.256804134238
1865 The 43 -th iteration of the EM(G) algorithm
1866 [0.26271035 0.29631668 0.07729588 0.08147655 0.00814224 0
    .4290349
1867 0.89912385]
1868 -10822.314303567211
1869 -2942.825399544511
1870
1871 M-step
1872 [0.26271035 0.29631668 0.07729588 0.08147655 0.00814224 0
    .4290349
1873 0.89912385]
1874 -10822.314303567211
1875 -2942.825399544511
1876 [0.27155408 0.30419028 0.06499912 0.07266732 0.
    00810483 0.42944442
1877 0.90626562]
1878 -10849.554838580329
1879 [0.26713221 0.30025348 0.0711475 0.07707194 0.
    00812354 0.42923966
1880 0.90269473]
1881 -10828.639879963448
1882 [0.26492128 0.29828508 0.07422169 0.07927424 0.
    00813289 0.42913728
1883 0.90090929]
1884 -10823.63819954017
1885 [0.26381582 0.29730088 0.07575878 0.08037539 0.
    00813757 0.42908609
1886 0.90001657]
1887 -10822.514672144893
1888 [0.26326309 0.29680878 0.07652733 0.08092597 0.
    0081399 0.42906049
1889 0.89957021]
1890 -10822.298859033897
1891
1892 [0.26326309 0.29680878 0.07652733 0.08092597 0.0081399
    0.42906049
1893 0.89957021]
1894 -10822.298859033897
1895 -2942.8099550111974
1896 [0.2630257 0.29671098 0.07755361 0.08180159 0.
    00814254 0.42908484
1897 0.90001219]
1898 -10822.290057498572
```

```

1899 The 44 -th iteration of the EM(G) algorithm
1900 [0.26326309 0.29680878 0.07652733 0.08092597 0.0081399 0
     .42906049
1901 0.89957021]
1902 -10805.570437364617
1903 -2942.6951651956033
1904
1905 M-step
1906 [0.26326309 0.29680878 0.07652733 0.08092597 0.0081399 0
     .42906049
1907 0.89957021]
1908 -10805.570437364617
1909 -2942.6951651956033
1910      [0.27195923 0.30461226 0.06452192 0.07226567 0.
     00844209 0.42957667
1911 0.90676276]
1912      -10831.683856038415
1913      [0.26761116 0.30071052 0.07052462 0.07659582 0.
     008291 0.42931858
1914 0.90316649]
1915      -10811.6272096683
1916      [0.26543712 0.29875965 0.07352598 0.0787609 0.
     00821545 0.42918954
1917 0.90136835]
1918      -10806.83464958692
1919      [0.2643501 0.29778421 0.07502665 0.07984343 0.
     00817768 0.42912501
1920 0.90046928]
1921      -10805.759736502914
1922      [0.26380659 0.2972965 0.07577699 0.0803847 0.
     00815879 0.42909275
1923 0.90001974]
1924      -10805.554165395934
1925
1926      [0.26380659 0.2972965 0.07577699 0.0803847 0.00815879
     0.42909275
1927 0.90001974]
1928 -10805.554165395934
1929 -2942.67889322692
1930      [0.26358142 0.29720531 0.07677727 0.08124505 0.
     00816894 0.42911292
1931 0.90046283]
1932      -10805.544441813403
1933 The 45 -th iteration of the EM(G) algorithm
1934 [0.26380659 0.2972965 0.07577699 0.0803847 0.00815879 0
     .42909275
1935 0.90001974]
1936 -10788.952905876455
1937 -2942.5687477072515
1938

```

```

1939 M-step
1940 [0.26380659 0.2972965 0.07577699 0.0803847 0.00815879 0
     .42909275
1941 0.90001974]
1942 -10788.952905876455
1943 -2942.5687477072515
1944 [0.27236547 0.3050369 0.06403847 0.071853 0.
     00857552 0.4295392
1945 0.90722746]
1946 -10814.065022896799
1947 [0.26808603 0.3011667 0.06990773 0.07611885 0.
     00836716 0.42931598
1948 0.9036236 ]
1949 -10794.77184724916
1950 [0.26594631 0.2992316 0.07284236 0.07825178 0.
     00826297 0.42920436
1951 0.90182167]
1952 -10790.164688328148
1953 [0.26487645 0.29826405 0.07430968 0.07931824 0.
     00821088 0.42914856
1954 0.90092071]
1955 -10789.132708375493
1956 [0.26434152 0.29778027 0.07504333 0.07985147 0.
     00818484 0.42912066
1957 0.90047022]
1958 -10788.93607720413
1959
1960 [0.26434152 0.29778027 0.07504333 0.07985147 0.00818484
     0.42912066
1961 0.90047022]
1962 -10788.93607720413
1963 -2942.551919034926
1964 [0.2641274 0.29769479 0.07602 0.08069877 0.
     00819924 0.4291353
1965 0.90091371]
1966 -10788.925556413615
1967
1968 [0.2641274 0.29769479 0.07602 0.08069877 0.00819924
     0.4291353
1969 0.90091371]
1970 -10788.925556413615
1971 -2942.5413982444115
1972 [0.26469554 0.29824474 0.07506049 0.07982341 0.
     00811993 0.42908827
1973 0.90132852]
1974 -10788.922280969397
1975 The 46 -th iteration of the EM(G) algorithm
1976 [0.2641274 0.29769479 0.07602 0.08069877 0.00819924 0
     .4291353
1977 0.90091371]

```

```

1978 -10790.961731473293
1979 -2942.5365990204737
1980
1981 M-step
1982 [0.2641274 0.29769479 0.07602      0.08069877 0.00819924 0
      .4291353
1983 0.90091371]
1984 -10790.961731473293
1985 -2942.5365990204737
1986      [0.27276576 0.30551736 0.06406049 0.07191974 0.
      00690315 0.42836679
1987 0.90754038]
1988      -10817.230558595578
1989      [0.26844658 0.30160608 0.07004025 0.07630926 0.
      0075512 0.42875105
1990 0.90422705]
1991      -10797.064761231339
1992      [0.26628699 0.29965043 0.07303013 0.07850401 0.
      00787522 0.42894317
1993 0.90257038]
1994      -10792.241188078031
1995      [0.2652072 0.29867261 0.07452506 0.07960139 0.
      00803723 0.42903924
1996 0.90174204]
1997      -10791.156575242541
1998      [0.2646673 0.2981837 0.07527253 0.08015008 0.
      00811824 0.42908727
1999 0.90132787]
2000      -10790.947729171065
2001
2002 [0.2646673 0.2981837 0.07527253 0.08015008 0.00811824
      0.42908727
2003 0.90132787]
2004 -10790.947729171065
2005 -2942.522596718245
2006      [0.2644443 0.29808824 0.07627031 0.08102274 0.
      00810641 0.4290971
2007 0.9017469 ]
2008      -10790.939505811559
2009 The 47 -th iteration of the EM(G) algorithm
2010 [0.2646673 0.2981837 0.07527253 0.08015008 0.00811824 0
      .42908727
2011 0.90132787]
2012 -10774.19583324128
2013 -2942.412522265574
2014
2015 M-step
2016 [0.2646673 0.2981837 0.07527253 0.08015008 0.00811824 0
      .42908727
2017 0.90132787]

```

```

2018 -10774.19583324128
2019 -2942.412522265574
2020 [0.27314185 0.30591351 0.06366354 0.0715948 0.
     00817959 0.42936649
2021 0.90814882]
2022 -10798.988072874778
2023 [0.26890457 0.30204861 0.06946804 0.07587244 0.
     00814891 0.42922688
2024 0.90473835]
2025 -10779.946780083012
2026 [0.26678594 0.30011615 0.07237029 0.07801126 0.
     00813357 0.42915707
2027 0.90303311]
2028 -10775.396777285285
2029 [0.26572662 0.29914993 0.07382141 0.07908067 0.
     00812591 0.42912217
2030 0.90218049]
2031 -10774.376025834392
2032 [0.26519696 0.29866681 0.07454697 0.07961538 0.
     00812207 0.42910472
2033 0.90175418]
2034 -10774.180654391941
2035
2036 [0.26519696 0.29866681 0.07454697 0.07961538 0.00812207
     0.42910472
2037 0.90175418]
2038 -10774.180654391941
2039 -2942.3973434162353
2040 [0.26498851 0.29858114 0.07551254 0.08046436 0.
     00812992 0.42912177
2041 0.9021762 ]
2042 -10774.171348512647
2043 The 48 -th iteration of the EM(G) algorithm
2044 [0.26519696 0.29866681 0.07454697 0.07961538 0.00812207 0
     .42910472
2045 0.90175418]
2046 -10757.653588032957
2047 -2942.292813948404
2048
2049 M-step
2050 [0.26519696 0.29866681 0.07454697 0.07961538 0.00812207 0
     .42910472
2051 0.90175418]
2052 -10757.653588032957
2053 -2942.292813948404
2054 [0.27353649 0.30632989 0.06320696 0.07120224 0.
     00849224 0.42949632
2055 0.90862043]
2056 -10781.447914955605
2057 [0.26936673 0.30249835 0.06887697 0.07540881 0.

```

```
2057 00830715 0.42930052
2058 0.9051873 ]
2059 -10763.166784115532
2060 [0.26728184 0.30058258 0.07171197 0.07751209 0.
00821461 0.42920262
2061 0.90347074]
2062 -10758.80173642699
2063 [0.2662394 0.2996247 0.07312947 0.07856373 0.
00816834 0.42915367
2064 0.90261246]
2065 -10757.82400117535
2066 [0.26571818 0.29914576 0.07383822 0.07908955 0.
00814521 0.4291292
2067 0.90218332]
2068 -10757.637686299173
2069
2070 [0.26571818 0.29914576 0.07383822 0.07908955 0.00814521
0.4291292
2071 0.90218332]
2072 -10757.637686299173
2073 -2942.276912214619
2074 [0.26552068 0.29906628 0.07477983 0.07992397 0.
00815952 0.42914296
2075 0.90260624]
2076 -10757.627590627222
2077
2078 [0.26552068 0.29906628 0.07477983 0.07992397 0.00815952
0.42914296
2079 0.90260624]
2080 -10757.627590627222
2081 -2942.2668165426685
2082 [0.26606747 0.29960752 0.07386554 0.07906744 0.
00808355 0.42909736
2083 0.90300167]
2084 -10757.624147976214
2085 The 49 -th iteration of the EM(G) algorithm
2086 [0.26552068 0.29906628 0.07477983 0.07992397 0.00815952 0
.42914296
2087 0.90260624]
2088 -10759.59200920861
2089 -2942.262336643699
2090
2091 M-step
2092 [0.26552068 0.29906628 0.07477983 0.07992397 0.00815952 0
.42914296
2093 0.90260624]
2094 -10759.59200920861
2095 -2942.262336643699
2096 [0.27393337 0.30680604 0.06323397 0.07127827 0.
00691934 0.42839865
```

```

2097 0.9089236 ]
2098          -10784.443094742632
2099          [0.26972703 0.30293616 0.0690069 0.07560112 0.
2100          00753943 0.4287708
2100 0.90576492]
2101          -10765.36452887377
2102          [0.26762386 0.30100122 0.07189336 0.07776254 0.
2102          00784947 0.42895688
2103 0.90418558]
2104          -10760.8018378382
2105          [0.26657227 0.30003375 0.07333659 0.07884326 0.
2105          00800449 0.42904992
2106 0.90339591]
2107          -10759.776079552541
2108          [0.26604648 0.29955002 0.07405821 0.07938361 0.
2108          008082 0.42909644
2109 0.90300108]
2110          -10759.578645423486
2111
2112  [0.26604648 0.29955002 0.07405821 0.07938361 0.008082
2112          0.42909644
2113 0.90300108]
2114 -10759.578645423486
2115 -2942.2489728585742
2116          [0.26584078 0.2994612 0.07501943 0.08024185 0.
2116          00807154 0.42910591
2117 0.90340083]
2118          -10759.570619919325
2119 The 50 -th iteration of the EM(G) algorithm
2120  [0.26604648 0.29955002 0.07405821 0.07938361 0.008082 0
2120          .42909644
2121 0.90300108]
2122 -10742.935883898745
2123 -2942.1448367582434
2124
2125 M-step
2126  [0.26604648 0.29955002 0.07405821 0.07938361 0.008082 0
2126          .42909644
2127 0.90300108]
2128 -10742.935883898745
2129 -2942.1448367582434
2130          [0.27430328 0.30719937 0.0628479 0.07095623 0.
2130          00815536 0.42936498
2131 0.90950939]
2132          -10766.4062147674
2133          [0.27017488 0.30337469 0.06845306 0.07516992 0.
2133          00811868 0.42923071
2134 0.90625523]
2135          -10748.379183929821
2136          [0.26811068 0.30146236 0.07125563 0.07727677 0.

```

```

2136 00810034 0.42916358
2137 0.90462816]
2138 -10744.072294865073
2139 [0.26707858 0.30050619 0.07265692 0.07833019 0.
00809117 0.42913001
2140 0.90381462]
2141 -10743.10625217302
2142 [0.26656253 0.3000281 0.07335757 0.0788569 0.
00808659 0.42911322
2143 0.90340785]
2144 -10742.921418342046
2145
2146 [0.26656253 0.3000281 0.07335757 0.0788569 0.00808659
0.42911322
2147 0.90340785]
2148 -10742.921418342046
2149 -2942.130371201545
2150 [0.26637053 0.29994873 0.074288 0.07969209 0.
00809515 0.42912963
2151 0.90381068]
2152 -10742.912393613387
2153 The 51 -th iteration of the EM(G) algorithm
2154 [0.26656253 0.3000281 0.07335757 0.0788569 0.00808659 0
.42911322
2155 0.90340785]
2156 -10726.506458869753
2157 -2942.0314194025086
2158
2159 M-step
2160 [0.26656253 0.3000281 0.07335757 0.0788569 0.00808659 0
.42911322
2161 0.90340785]
2162 -10726.506458869753
2163 -2942.0314194025086
2164 [0.27469105 0.30761197 0.06240458 0.07056968 0.
00845859 0.42948972
2165 0.90996282]
2166 -10749.042630929931
2167 [0.27062679 0.30382003 0.06788107 0.07471329 0.
00827259 0.42930147
2168 0.90668534]
2169 -10731.727206433883
2170 [0.26859466 0.30192407 0.07061932 0.07678509 0.
00817959 0.42920735
2171 0.90504659]
2172 -10727.593443248532
2173 [0.26757859 0.30097609 0.07198844 0.077821 0.
00813309 0.42916029
2174 0.90422722]
2175 -10726.667667127636

```

```
2176 [0.26707056 0.30050209 0.072673 0.07833895 0.  
00810984 0.42913676  
2177 0.90381753]  
2178 -10726.491312931319  
2179  
2180 [0.26707056 0.30050209 0.072673 0.07833895 0.00810984  
0.42913676  
2181 0.90381753]  
2182 -10726.491312931319  
2183 -2942.0162734640744  
2184 [0.26688885 0.30042876 0.07358056 0.07915979 0.  
00812465 0.42914995  
2185 0.90422141]  
2186 -10726.481554252307  
2187 The 52 -th iteration of the EM(G) algorithm  
2188 [0.26707056 0.30050209 0.072673 0.07833895 0.00810984 0  
.42913676  
2189 0.90381753]  
2190 -10710.213572197224  
2191 -2941.9211711335056  
2192  
2193 M-step  
2194 [0.26707056 0.30050209 0.072673 0.07833895 0.00810984 0  
.42913676  
2195 0.90381753]  
2196 -10710.213572197224  
2197 -2941.9211711335056  
2198 [0.27507962 0.30802673 0.06195559 0.07017375 0.  
00857678 0.42945946  
2199 0.91038692]  
2200 -10731.918535243536  
2201 [0.27107509 0.30426441 0.0673143 0.07425635 0.  
00834331 0.42929811  
2202 0.90710223]  
2203 -10715.236989389176  
2204 [0.26907283 0.30238325 0.06999365 0.07629765 0.  
00822657 0.42921743  
2205 0.90545988]  
2206 -10711.257080761376  
2207 [0.26807169 0.30144267 0.07133333 0.0773183 0.  
00816821 0.42917709  
2208 0.90463871]  
2209 -10710.36691694962  
2210 [0.26757113 0.30097238 0.07200317 0.07782862 0.  
00813902 0.42915692  
2211 0.90422812]  
2212 -10710.197972704422  
2213  
2214 [0.26757113 0.30097238 0.07200317 0.07782862 0.00813902  
0.42915692
```

```
2215 0.90422812]
2216 -10710.197972704422
2217 -2941.905571640703
2218 [0.26739872 0.30090428 0.07288997 0.07863709 0.
00815719 0.42916564
2219 0.9046324 ]
2220 -10710.18757908868
2221
2222 [0.26739872 0.30090428 0.07288997 0.07863709 0.00815719
0.42916564
2223 0.9046324 ]
2224 -10710.18757908868
2225 -2941.8951780249618
2226 [0.26791317 0.30142926 0.07204594 0.07781803 0.
00808874 0.42911819
2227 0.90501039]
2228 -10710.18297691324
2229 The 53 -th iteration of the EM(G) algorithm
2230 [0.26739872 0.30090428 0.07288997 0.07863709 0.00815719 0
.42916564
2231 0.9046324 ]
2232 -10711.99614645197
2233 -2941.8912107541673
2234
2235 M-step
2236 [0.26739872 0.30090428 0.07288997 0.07863709 0.00815719 0
.42916564
2237 0.9046324 ]
2238 -10711.99614645197
2239 -2941.8912107541673
2240 [0.2754757 0.30850146 0.06197775 0.07024914 0.
00704141 0.4283938
2241 0.9106726 ]
2242 -10734.658017646649
2243 [0.27143721 0.30470287 0.06743386 0.07444311 0.
0075993 0.42877972
2244 0.9076525 ]
2245 -10717.254608345589
2246 [0.26941797 0.30280358 0.07016192 0.0765401 0.
00787825 0.42897268
2247 0.90614245]
2248 -10713.095557650046
2249 [0.26840835 0.30185393 0.07152594 0.0775886 0.
00801772 0.42906916
2250 0.90538743]
2251 -10712.161958056133
2252 [0.26790354 0.30137911 0.07220796 0.07811284 0.
00808746 0.4291174
2253 0.90500991]
2254 -10711.98289851916
```

```
2255
2256 [0.26790354 0.30137911 0.07220796 0.07811284 0.00808746
      0.4291174
2257 0.90500991]
2258 -10711.98289851916
2259 -2941.877962821358
2260      [0.2677235 0.30130215 0.07311321 0.07894406 0.
      00808086 0.42912269
2261 0.90539203]
2262      -10711.974366497792
2263 The 54 -th iteration of the EM(G) algorithm
2264 [0.26790354 0.30137911 0.07220796 0.07811284 0.00808746 0
      .4291174
2265 0.90500991]
2266 -10695.577656872922
2267 -2941.7829385554323
2268
2269 M-step
2270 [0.26790354 0.30137911 0.07220796 0.07811284 0.00808746 0
      .4291174
2271 0.90500991]
2272 -10695.577656872922
2273 -2941.7829385554323
2274      [0.27583699 0.30889058 0.06160737 0.06993229 0.
      00820848 0.42931198
2275 0.91122965]
2276      -10717.009014228468
2277      [0.27187026 0.30513484 0.06690766 0.07402257 0.
      00814797 0.42921469
2278 0.90811978]
2279      -10700.542818547812
2280      [0.2698869 0.30325698 0.06955781 0.07606771 0.
      00811771 0.42916604
2281 0.90656485]
2282      -10696.61180000032
2283      [0.26889522 0.30231804 0.07088288 0.07709028 0.
      00810258 0.42914172
2284 0.90578738]
2285      -10695.731275203118
2286      [0.26839938 0.30184858 0.07154542 0.07760156 0.
      00809502 0.42912956
2287 0.90539865]
2288      -10695.563435209706
2289
2290      [0.26839938 0.30184858 0.07154542 0.07760156 0.00809502
      0.42912956
2291 0.90539865]
2292 -10695.563435209706
2293 -2941.7687168922166
2294      [0.26823175 0.30178045 0.07242217 0.07841092 0.
```

```
2294 00810599 0.4291418
2295 0.90578358]
2296 -10695.554050453324
2297 The 55 -th iteration of the EM(G) algorithm
2298 [0.26839938 0.30184858 0.07154542 0.07760156 0.00809502 0
.42912956
2299 0.90539865]
2300 -10679.386823381028
2301 -2941.6783112084167
2302
2303 M-step
2304 [0.26839938 0.30184858 0.07154542 0.07760156 0.00809502 0
.42912956
2305 0.90539865]
2306 -10679.386823381028
2307 -2941.6783112084167
2308 [0.27621488 0.30929755 0.06118305 0.06955515 0.
00849181 0.42943259
2309 0.91166101]
2310 -10699.986766542086
2311 [0.27230713 0.30557306 0.06636423 0.07357835 0.
00829342 0.42928108
2312 0.90852983]
2313 -10684.153976905402
2314 [0.27035325 0.30371082 0.06895483 0.07558996 0.
00819422 0.42920532
2315 0.90696424]
2316 -10680.377022372752
2317 [0.26937631 0.3027797 0.07025012 0.07659576 0.
00814462 0.42916744
2318 0.90618144]
2319 -10679.532313375114
2320 [0.26888785 0.30231414 0.07089777 0.07709866 0.
00811982 0.4291485
2321 0.90579005]
2322 -10679.372008284601
2323
2324 [0.26888785 0.30231414 0.07089777 0.07709866 0.00811982
0.4291485
2325 0.90579005]
2326 -10679.372008284601
2327 -2941.66349611199
2328 [0.2687295 0.30225169 0.07175342 0.0778943 0.
00813635 0.42915808
2329 0.90617588]
2330 -10679.361996087639
2331
2332 [0.2687295 0.30225169 0.07175342 0.0778943 0.00813635
0.42915808
2333 0.90617588]
```

```
2334 -10679.361996087639
2335 -2941.653483915027
2336 [0.26922561 0.30276826 0.07094902 0.07709381 0.
00806959 0.42911342
2337 0.9065365 ]
2338 -10679.357318175415
2339 The 56 -th iteration of the EM(G) algorithm
2340 [0.2687295 0.30225169 0.07175342 0.0778943 0.00813635 0
.42915808
2341 0.90617588]
2342 -10681.09346723494
2343 -2941.6497644385363
2344
2345 M-step
2346 [0.2687295 0.30225169 0.07175342 0.0778943 0.00813635 0
.42915808
2347 0.90617588]
2348 -10681.09346723494
2349 -2941.6497644385363
2350 [0.27660722 0.3097681 0.0612102 0.06963892 0.
00704967 0.42843204
2351 0.91193912]
2352 -10702.565980048268
2353 [0.27266836 0.30600989 0.06648181 0.07376661 0.
00759301 0.42879506
2354 0.9090575 ]
2355 -10686.074753379773
2356 [0.27069893 0.30413079 0.06911761 0.07583046 0.
00786468 0.42897657
2357 0.90761669]
2358 -10682.134507943838
2359 [0.26971421 0.30319124 0.07043551 0.07686238 0.
00800052 0.42906732
2360 0.90689628]
2361 -10681.250251188769
2362 [0.26922185 0.30272146 0.07109447 0.07737834 0.
00806844 0.4291127
2363 0.90653608]
2364 -10681.080757807968
2365
2366 [0.26922185 0.30272146 0.07109447 0.07737834 0.00806844
0.4291127
2367 0.90653608]
2368 -10681.080757807968
2369 -2941.6370550115644
2370 [0.26905647 0.30265074 0.0719672 0.07819531 0.
00806182 0.42911896
2371 0.90690096]
2372 -10681.072417757574
2373 The 57 -th iteration of the EM(G) algorithm
```

```
2374 [0.26922185 0.30272146 0.07109447 0.07737834 0.00806844 0  
.4291127  
2375 0.90653608]  
2376 -10664.810221504871  
2377 -2941.547012780855  
2378  
2379 M-step  
2380 [0.26922185 0.30272146 0.07109447 0.07737834 0.00806844 0  
.4291127  
2381 0.90653608]  
2382 -10664.810221504871  
2383 -2941.547012780855  
2384 [0.27696272 0.31015431 0.06084988 0.0693255 0.  
00818041 0.42931835  
2385 0.9124761 ]  
2386 -10685.12975189401  
2387 [0.27309229 0.30643789 0.06597217 0.07335192 0.  
00812442 0.42921552  
2388 0.90950609]  
2389 -10669.51671627344  
2390 [0.27115707 0.30457968 0.06853332 0.07536513 0.  
00809643 0.42916411  
2391 0.90802109]  
2392 -10665.790117325185  
2393 [0.27018946 0.30365057 0.06981389 0.07637173 0.  
00808243 0.42913841  
2394 0.90727858]  
2395 -10664.955583869976  
2396 [0.26970566 0.30318602 0.07045418 0.07687504 0.  
00807543 0.42912555  
2397 0.90690733]  
2398 -10664.796600758811  
2399  
2400 [0.26970566 0.30318602 0.07045418 0.07687504 0.00807543  
.42912555  
2401 0.90690733]  
2402 -10664.796600758811  
2403 -2941.533392034795  
2404 [0.26955198 0.30312382 0.07129968 0.07767072 0.  
00808594 0.42913836  
2405 0.90727511]  
2406 -10664.787475074321  
2407 The 58 -th iteration of the EM(G) algorithm  
2408 [0.26970566 0.30318602 0.07045418 0.07687504 0.00807543 0  
.42912555  
2409 0.90690733]  
2410 -10648.756243204258  
2411 -2941.447677350794  
2412  
2413 M-step
```

```

2414 [0.26970566 0.30318602 0.07045418 0.07687504 0.00807543 0
      .42912555
2415 0.90690733]
2416 -10648.756243204258
2417 -2941.447677350794
2418 [0.27733411 0.3105575 0.06043773 0.06895446 0.
      00845626 0.42943344
2419 0.9128915 ]
2420 -10668.295556796253
2421 [0.27351988 0.30687176 0.06544596 0.07291475 0.
      00826585 0.4292795
2422 0.90989941]
2423 -10653.276939424892
2424 [0.27161277 0.30502889 0.06795007 0.07489489 0.
      00817064 0.42920253
2425 0.90840337]
2426 -10649.69490411518
2427 [0.27065921 0.30410745 0.06920212 0.07588496 0.
      00812304 0.42916404
2428 0.90765535]
2429 -10648.893976985428
2430 [0.27018244 0.30364673 0.06982815 0.07638 0.
      00809924 0.4291448
2431 0.90728134]
2432 -10648.742064444501
2433
2434 [0.27018244 0.30364673 0.06982815 0.07638 0.00809924
      0.4291448
2435 0.90728134]
2436 -10648.742064444501
2437 -2941.4334985910373
2438 [0.27003748 0.30359006 0.0706535 0.07716219 0.
      00811524 0.42915489
2439 0.90765017]
2440 -10648.732356124547
2441 The 59 -th iteration of the EM(G) algorithm
2442 [0.27018244 0.30364673 0.06982815 0.07638 0.00809924 0
      .4291448
2443 0.90728134]
2444 -10632.845608934656
2445 -2941.3509992812833
2446
2447 M-step
2448 [0.27018244 0.30364673 0.06982815 0.07638 0.00809924 0
      .4291448
2449 0.90728134]
2450 -10632.845608934656
2451 -2941.3509992812833
2452 [0.27770616 0.31096241 0.0600206 0.06857544 0.
      00856352 0.42940696

```

```
2453 0.91328025]
2454          -10651.689189147372
2455          [0.2739443  0.30730457 0.06492438 0.07247772 0.
2456          00833138 0.42927588
2457 0.9102808 ]
2458          -10637.201231731906
2459          [0.27206337 0.30547565 0.06737626 0.07442886 0.
2460          00821531 0.42921034
2461 0.90878107]
2462          -10633.747928481478
2463          [0.2711229 0.30456119 0.06860221 0.07540443 0.
2464          00815727 0.42917757
2465 0.90803121]
2466          -10632.976782603804
2467          [0.27065267 0.30410396 0.06921518 0.07589222 0.
2468          00812825 0.42916118
2469 0.90765627]
2470          -10632.831060452998
2471          -2941.336450799625
2472          [0.27051559 0.30405211 0.07002226 0.07666268 0.
2473          00814715 0.42916737
2474 0.90802557]
2475          -10632.820847124602
2476          [0.27051559 0.30405211 0.07002226 0.07666268 0.00814715
2477          0.42916737
2478 0.90802557]
2479          -10632.820847124602
2480          -2941.3262374712285
2481          [0.27098398 0.3045533 0.06927919 0.07589824 0.
2482          00808622 0.42912211
2483 0.90837077]
2484          -10632.815312364663
2485 The 60 -th iteration of the EM(G) algorithm
2486 [0.27051559 0.30405211 0.07002226 0.07666268 0.00814715 0
2487          .42916737
2488 0.90802557]
2489 -10634.393781623512
2490 -2941.3229129584697
2491 M-step
2492 [0.27051559 0.30405211 0.07002226 0.07666268 0.00814715 0
2493          .42916737
2494 0.90802557]
2495 -10634.393781623512
```

```
2493 -2941.3229129584697
2494 [0.27809702 0.31143143 0.06004387 0.06865838 0.
      00715733 0.42843348
2495 0.9135436 ]
2496 -10654.027098569612
2497 [0.27430631 0.30774177 0.06503306 0.07266053 0.
      00765224 0.42880043
2498 0.91078458]
2499 -10638.943405190585
2500 [0.27241095 0.30589694 0.06752766 0.0746616 0.
      00789969 0.4289839
2501 0.90940508]
2502 -10635.34226047746
2503 [0.27146327 0.30497452 0.06877496 0.07566214 0.
      00802342 0.42907564
2504 0.90871532]
2505 -10634.535260221699
2506 [0.27098943 0.30451332 0.06939861 0.07616241 0.
      00808528 0.4291215
2507 0.90837045]
2508 -10634.38118320077
2509
2510 [0.27098943 0.30451332 0.06939861 0.07616241 0.00808528
      0.4291215
2511 0.90837045]
2512 -10634.38118320077
2513 -2941.310314535728
2514 [0.27084581 0.30445362 0.07022172 0.07695318 0.
      00808123 0.42912489
2515 0.90871971]
2516 -10634.37247283451
2517 The 61 -th iteration of the EM(G) algorithm
2518 [0.27098943 0.30451332 0.06939861 0.07616241 0.00808528 0
      .4291215
2519 0.90837045]
2520 -10618.37984603734
2521 -2941.2279270754852
2522
2523 M-step
2524 [0.27098943 0.30451332 0.06939861 0.07616241 0.00808528 0
      .4291215
2525 0.90837045]
2526 -10618.37984603734
2527 -2941.2279270754852
2528 [0.27844448 0.31181337 0.05969789 0.06835057 0.
      00822569 0.42927495
2529 0.91405494]
2530 -10636.983071408764
2531 [0.27471696 0.30816335 0.06454825 0.07225649 0.
      00815549 0.42919823
```

```

2532 0.9112127 ]
2533      -10622.68402632434
2534      [0.2728532 0.30633833 0.06697343 0.07420945 0.
2535 00812038 0.42915987
2535 0.90979157]
2536      -10619.273733761058
2537      [0.27192131 0.30542582 0.06818602 0.07518593 0.
2538 00810283 0.42914068
2538 0.90908101]
2539      -10618.511139382368
2540      [0.27145537 0.30496957 0.06879231 0.07567417 0.
2540 00809406 0.42913109
2541 0.90872573]
2542      -10618.366442945393
2543
2544 [0.27145537 0.30496957 0.06879231 0.07567417 0.00809406
2544 0.42913109
2545 0.90872573]
2546 -10618.366442945393
2547 -2941.214523983538
2548      [0.27132239 0.30491786 0.06959022 0.07644477 0.
2548 00810592 0.42914096
2549 0.90907766]
2550      -10618.35706426518
2551 The 62 -th iteration of the EM(G) algorithm
2552 [0.27145537 0.30496957 0.06879231 0.07567417 0.00809406 0
2552 .42913109
2553 0.90872573]
2554 -10602.593911323469
2555 -2941.136002748027
2556
2557 M-step
2558 [0.27145537 0.30496957 0.06879231 0.07567417 0.00809406 0
2558 .42913109
2559 0.90872573]
2560 -10602.593911323469
2561 -2941.136002748027
2562      [0.27880673 0.31221102 0.05930321 0.06798903 0.
2562 00848433 0.42938574
2563 0.91445085]
2564      -10620.499996300307
2565      [0.27513105 0.30859029 0.06404776 0.0718316 0.
2565 0082892 0.42925842
2566 0.91158829]
2567      -10606.73216076307
2568      [0.27329321 0.30677993 0.06642004 0.07375288 0.
2568 00819163 0.42919476
2569 0.91015701]
2570      -10603.451003128192
2571      [0.27237429 0.30587475 0.06760618 0.07471352 0.

```

```
2571 00814284 0.42916292
2572 0.90944137]
2573 -10602.718412318362
2574 [0.27191483 0.30542216 0.06819924 0.07519385 0.
00811845 0.42914701
2575 0.90908355]
2576 -10602.58002133286
2577
2578 [0.27191483 0.30542216 0.06819924 0.07519385 0.00811845
0.42914701
2579 0.90908355]
2580 -10602.58002133286
2581 -2941.122112757418
2582 [0.27178973 0.30537565 0.06897855 0.07595155 0.
00813528 0.42915456
2583 0.90943641]
2584 -10602.570145401703
2585 The 63 -th iteration of the EM(G) algorithm
2586 [0.27191483 0.30542216 0.06819924 0.07519385 0.00811845 0
.42914701
2587 0.90908355]
2588 -10586.952921756936
2589 -2941.0464650064505
2590
2591 M-step
2592 [0.27191483 0.30542216 0.06819924 0.07519385 0.00811845 0
.42914701
2593 0.90908355]
2594 -10586.952921756936
2595 -2941.0464650064505
2596 [0.27916944 0.31261014 0.05890391 0.06762018 0.
008584 0.42936259
2597 0.91482163]
2598 -10604.23663094547
2599 [0.27554214 0.30901615 0.06355158 0.07140702 0.
00835122 0.4292548
2600 0.91195259]
2601 -10590.943586440852
2602 [0.27372849 0.30721916 0.06587541 0.07330043 0.
00823484 0.42920091
2603 0.91051807]
2604 -10587.7775534171
2605 [0.27282166 0.30632066 0.06703733 0.07424714 0.
00817664 0.42917396
2606 0.90980081]
2607 -10587.0715793443
2608 [0.27236825 0.30587141 0.06761829 0.07472049 0.
00814755 0.42916048
2609 0.90944218]
2610 -10586.938713408994
```

```
2611
2612 [0.27236825 0.30587141 0.06761829 0.07472049 0.00814755
      0.42916048
2613 0.90944218]
2614 -10586.938713408994
2615 -2941.0322566585082
2616 [0.27225026 0.30582944 0.06838073 0.07546694 0.
      00816691 0.42916458
2617 0.90979543]
2618 -10586.928406833975
2619
2620 [0.27225026 0.30582944 0.06838073 0.07546694 0.00816691
      0.42916458
2621 0.90979543]
2622 -10586.928406833975
2623 -2941.021950083489
2624 [0.27269358 0.30631609 0.06769355 0.07473682 0.
      00811024 0.42911999
2625 0.91012571]
2626 -10586.922227389128
2627 The 64 -th iteration of the EM(G) algorithm
2628 [0.27225026 0.30582944 0.06838073 0.07546694 0.00816691 0
      .42916458
2629 0.90979543]
2630 -10588.34819138391
2631 -2941.0189540265246
2632
2633 M-step
2634 [0.27225026 0.30582944 0.06838073 0.07546694 0.00816691 0
      .42916458
2635 0.90979543]
2636 -10588.34819138391
2637 -2941.0189540265246
2638 [0.27955762 0.3130766 0.05892684 0.06770546 0.
      00724834 0.42844313
2639 0.91507625]
2640 -10606.337921984516
2641 [0.27590394 0.30945302 0.06365379 0.0715862 0.
      00770762 0.42880385
2642 0.91243584]
2643 -10592.512371976496
2644 [0.2740771 0.30764123 0.06601726 0.07352657 0.
      00793727 0.42898422
2645 0.91111564]
2646 -10589.214154445508
2647 [0.27316368 0.30673533 0.067199 0.07449676 0.
      00805209 0.4290744
2648 0.91045553]
2649 -10588.476101042805
2650 [0.27270697 0.30628238 0.06778987 0.07498185 0.
```

```
2650 0081095 0.42911949
2651 0.91012548]
2652          -10588.335747944522
2653
2654 [0.27270697 0.30628238 0.06778987 0.07498185 0.0081095
      0.42911949
2655 0.91012548]
2656 -10588.335747944522
2657 -2941.006510587137
2658          [0.27258298 0.3062331 0.0685671 0.07574732 0.
      00810681 0.42912132
2659 0.91045968]
2660          -10588.326782182989
2661 The 65 -th iteration of the EM(G) algorithm
2662 [0.27270697 0.30628238 0.06778987 0.07498185 0.0081095 0
      .42911949
2663 0.91012548]
2664 -10572.613808350005
2665 -2940.93096818666
2666
2667 M-step
2668 [0.27270697 0.30628238 0.06778987 0.07498185 0.0081095 0
      .42911949
2669 0.91012548]
2670 -10572.613808350005
2671 -2940.93096818666
2672          [0.27989718 0.31345411 0.05859457 0.06740357 0.
      00825991 0.42924219
2673 0.91556378]
2674          -10589.680286117717
2675          [0.27630207 0.30986825 0.06319222 0.07119271 0.
      00818471 0.42918084
2676 0.91284463]
2677          -10576.558072129357
2678          [0.27450452 0.30807532 0.06549104 0.07308728 0.
      0081471 0.42915016
2679 0.91148506]
2680          -10573.430884347967
2681          [0.27360574 0.30717885 0.06664045 0.07403456 0.
      0081283 0.42913483
2682 0.91080527]
2683          -10572.732610701112
2684          [0.27315636 0.30673062 0.06721516 0.07450821 0.
      0081189 0.42912716
2685 0.91046538]
2686          -10572.600654458374
2687
2688 [0.27315636 0.30673062 0.06721516 0.07450821 0.0081189
      0.42912716
2689 0.91046538]
```

```
2690 -10572.600654458374
2691 -2940.9178142950295
2692 [0.27304205 0.30668882 0.06796903 0.07525454 0.
      00813114 0.42913528
2693 0.91080207]
2694 -10572.591120410238
2695 The 66 -th iteration of the EM(G) algorithm
2696 [0.27315636 0.30673062 0.06721516 0.07450821 0.0081189 0
      .42912716
2697 0.91046538]
2698 -10557.105489383914
2699 -2940.84573686528
2700
2701 M-step
2702 [0.27315636 0.30673062 0.06721516 0.07450821 0.0081189 0
      .42912716
2703 0.91046538]
2704 -10557.105489383914
2705 -2940.84573686528
2706 [0.28025061 0.31384622 0.05821655 0.06705145 0.
      0085037 0.42934825
2707 0.91594159]
2708 -10573.546928074238
2709 [0.27670349 0.31028842 0.06271586 0.07077983 0.
      0083113 0.4292377
2710 0.91320348]
2711 -10560.901061564264
2712 [0.27492992 0.30850952 0.06496551 0.07264402 0.
      0082151 0.42918243
2713 0.91183443]
2714 -10557.889620481088
2715 [0.27404314 0.30762007 0.06609033 0.07357611 0.
      008167 0.42915479
2716 0.9111499 ]
2717 -10557.218224607856
2718 [0.27359975 0.30717534 0.06665275 0.07404216 0.
      00814295 0.42914098
2719 0.91080764]
2720 -10557.091910122117
2721
2722 [0.27359975 0.30717534 0.06665275 0.07404216 0.00814295
      0.42914098
2723 0.91080764]
2724 -10557.091910122117
2725 -2940.832157603483
2726 [0.27349258 0.30713844 0.06738943 0.07477615 0.
      00815977 0.42914705
2727 0.91114518]
2728 -10557.081951290758
2729 The 67 -th iteration of the EM(G) algorithm
```

```
2730 [0.27359975 0.30717534 0.06665275 0.07404216 0.00814295 0
     .42914098
2731 0.91080764]
2732 -10541.743010823317
2733 -2940.7626567505868
2734
2735 M-step
2736 [0.27359975 0.30717534 0.06665275 0.07404216 0.00814295 0
     .42914098
2737 0.91080764]
2738 -10541.743010823317
2739 -2940.7626567505868
2740      [0.28060443 0.31423969 0.05783426 0.06669272 0.
     00859719 0.42932743
2741 0.91629565]
2742      -10557.625799283223
2743      [0.27710209 0.31070751 0.0622435 0.07036744 0.
     00837007 0.4292342
2744 0.91355164]
2745      -10545.406182501603
2746      [0.27535092 0.30894143 0.06444812 0.0722048 0.
     00825651 0.42918759
2747 0.91217964]
2748      -10542.498048734982
2749      [0.27447533 0.30805839 0.06555044 0.07312348 0.
     00819973 0.42916428
2750 0.91149364]
2751      -10541.85052294111
2752      [0.27403754 0.30761686 0.06610159 0.07358282 0.
     00817134 0.42915263
2753 0.91115064]
2754      -10541.729156702992
2755
2756 [0.27403754 0.30761686 0.06610159 0.07358282 0.00817134
     0.42915263
2757 0.91115064]
2758 -10541.729156702992
2759 -2940.7488026302617
2760      [0.27393682 0.30758425 0.0668227 0.074306 0.
     00819045 0.42915556
2761 0.91148853]
2762      -10541.71883051389
2763
2764 [0.27393682 0.30758425 0.0668227 0.074306 0.00819045
     0.42915556
2765 0.91148853]
2766 -10541.71883051389
2767 -2940.73847644116
2768      [0.27435731 0.30805699 0.06618675 0.07360894 0.
     00813719 0.42911232
```

```
2769 0.91180454]
2770      -10541.712165893547
2771 The 68 -th iteration of the EM(G) algorithm
2772 [0.27393682 0.30758425 0.0668227 0.074306 0.00819045 0
.42915556
2773 0.91148853]
2774 -10542.988155431727
2775 -2940.7357579454792
2776
2777 M-step
2778 [0.27393682 0.30758425 0.0668227 0.074306 0.00819045 0
.42915556
2779 0.91148853]
2780 -10542.988155431727
2781 -2940.7357579454792
2782      [0.28098957 0.31470348 0.05785721 0.06678025 0.
00732912 0.4284572
2783 0.91654218]
2784      -10559.501844228305
2785      [0.27746319 0.31114387 0.06233995 0.07054313 0.
00775979 0.42880638
2786 0.91401535]
2787      -10546.806441842768
2788      [0.27570001 0.30936406 0.06458132 0.07242457 0.
00797512 0.42898097
2789 0.91275194]
2790      -10543.780178791709
2791      [0.27481841 0.30847415 0.06570201 0.07336529 0.
00808279 0.42906826
2792 0.91212023]
2793      -10543.103967047933
2794      [0.27437761 0.3080292 0.06626235 0.07383564 0.
00813662 0.42911191
2795 0.91180438]
2796      -10542.97589594615
2797
2798 [0.27437761 0.3080292 0.06626235 0.07383564 0.00813662
0.42911191
2799 0.91180438]
2800 -10542.97589594615
2801 -2940.7234984599027
2802      [0.2742714 0.30798978 0.06699707 0.07457662 0.
00813466 0.4291129
2803 0.91212418]
2804      -10542.966763882581
2805 The 69 -th iteration of the EM(G) algorithm
2806 [0.27437761 0.3080292 0.06626235 0.07383564 0.00813662 0
.42911191
2807 0.91180438]
2808 -10527.542194499492
```

```
2809 -2940.654105782879
2810
2811 M-step
2812 [0.27437761 0.3080292 0.06626235 0.07383564 0.00813662 0
.42911191
2813 0.91180438]
2814 -10527.542194499492
2815 -2940.654105782879
2816 [0.28132164 0.31507657 0.05753804 0.06648443 0.
00828777 0.42921571
2817 0.91700736]
2818 -10543.226530410211
2819 [0.27784963 0.31155289 0.0619002 0.07016004 0.
0082122 0.42916381
2820 0.91440587]
2821 -10531.162998547752
2822 [0.27611362 0.30979104 0.06408127 0.07199784 0.
00817441 0.42913786
2823 0.91310512]
2824 -10528.290343257073
2825 [0.27524562 0.30891012 0.06517181 0.07291674 0.
00815551 0.42912489
2826 0.91245475]
2827 -10527.649845712545
2828 [0.27481162 0.30846966 0.06571708 0.07337619 0.
00814607 0.4291184
2829 0.91212956]
2830 -10527.529307096462
2831
2832 [0.27481162 0.30846966 0.06571708 0.07337619 0.00814607
0.4291184
2833 0.91212956]
2834 -10527.529307096462
2835 -2940.6412183798484
2836 [0.27471424 0.30843727 0.06643014 0.07409899 0.
00815817 0.42912544
2837 0.91245171]
2838 -10527.519691906266
2839 The 70 -th iteration of the EM(G) algorithm
2840 [0.27481162 0.30846966 0.06571708 0.07337619 0.00814607 0
.4291184
2841 0.91212956]
2842 -10512.31962041915
2843 -2940.5749383390485
2844
2845 M-step
2846 [0.27481162 0.30846966 0.06571708 0.07337619 0.00814607 0
.4291184
2847 0.91212956]
2848 -10512.31962041915
```

```
2849 -2940.5749383390485
2850 [0.28166663 0.31546329 0.05717592 0.0661417 0.
     0085182 0.42931686
2851 0.91736823]
2852 -10527.441943489424
2853 [0.27823913 0.31196648 0.0614465 0.06975895 0.
     00833213 0.42921763
2854 0.9147489 ]
2855 -10515.806795855855
2856 [0.27652537 0.31021807 0.06358179 0.07156757 0.
     0082391 0.42916801
2857 0.91343923]
2858 -10513.038187055667
2859 [0.27566849 0.30934387 0.06464944 0.07247188 0.
     00819258 0.42914321
2860 0.9127844 ]
2861 -10512.421836760777
2862 [0.27524005 0.30890676 0.06518326 0.07292404 0.
     00816933 0.4291308
2863 0.91245698]
2864 -10512.306360624983
2865
2866 [0.27524005 0.30890676 0.06518326 0.07292404 0.00816933
     0.4291308
2867 0.91245698]
2868 -10512.306360624983
2869 -2940.561678544882
2870 [0.27514916 0.30887898 0.06588041 0.07363503 0.
     00818571 0.42913598
2871 0.91277991]
2872 -10512.296382959368
2873 The 71 -th iteration of the EM(G) algorithm
2874 [0.27524005 0.30890676 0.06518326 0.07292404 0.00816933 0
     .4291308
2875 0.91245698]
2876 -10497.243133315962
2877 -2940.4977154670614
2878
2879 M-step
2880 [0.27524005 0.30890676 0.06518326 0.07292404 0.00816933 0
     .4291308
2881 0.91245698]
2882 -10497.243133315962
2883 -2940.4977154670614
2884 [0.28201192 0.31585111 0.05680979 0.06579288 0.
     00860633 0.42929771
2885 0.91770658]
2886 -10511.86264477704
2887 [0.27862599 0.31237894 0.06099653 0.06935846 0.
     00838783 0.42921426
```

```
2888 0.91508178]
2889      -10500.611208279806
2890      [0.27693302 0.31064285 0.06308989 0.07114125 0.
2891      00827858 0.42917253
2891 0.91376938]
2892      -10497.935554324655
2893      [0.27608654 0.30977481 0.06413658 0.07203264 0.
2894      00822395 0.42915167
2894 0.91311318]
2895      -10497.340668806195
2896      [0.2756633 0.30934079 0.06465992 0.07247834 0.
2897      00819664 0.42914123
2897 0.91278508]
2898      -10497.229636173864
2899
2900      [0.2756633 0.30934079 0.06465992 0.07247834 0.00819664
2901      0.42914123
2901 0.91278508]
2902 -10497.229636173864
2903 -2940.484218324964
2904      [0.27557824 0.30931706 0.06534266 0.07317896 0.
2905      00821515 0.4291435
2905 0.91310833]
2906      -10497.21934488464
2907
2908      [0.27557824 0.30931706 0.06534266 0.07317896 0.00821515
2909      0.4291435
2909 0.91310833]
2910 -10497.21934488464
2911 -2940.4739270357386
2912      [0.2759779 0.30977647 0.06475373 0.07251375 0.
2913      00816477 0.42910192
2913 0.91341074]
2914      -10497.212322468587
2915 The 72 -th iteration of the EM(G) algorithm
2916 [0.27557824 0.30931706 0.06534266 0.07317896 0.00821515 0
2917      .4291435
2917 0.91310833]
2918 -10498.341607218961
2919 -2940.471443558752
2920
2921 M-step
2922 [0.27557824 0.30931706 0.06534266 0.07317896 0.00821515 0
2923      .4291435
2923 0.91310833]
2924 -10498.341607218961
2925 -2940.471443558752
2926      [0.28239388 0.31631225 0.05683298 0.06588239 0.
2927      00740253 0.42847295
2927 0.91794552]
```

```

2928      -10513.525093309436
2929      [0.27898606 0.31281465 0.06108782 0.06953067 0.
00780884 0.42880822
2930 0.91552692]
2931      -10501.848359011641
2932      [0.27728215 0.31106585 0.06321524 0.07135481 0.
008012 0.42897586
2933 0.91431763]
2934      -10499.067132999675
2935      [0.2764302 0.31019146 0.06427895 0.07226688 0.
00811358 0.42905968
2936 0.91371298]
2937      -10498.446588415492
2938      [0.27600422 0.30975426 0.06481081 0.07272292 0.
00816436 0.42910159
2939 0.91341065]
2940      -10498.329550266346
2941
2942      [0.27600422 0.30975426 0.06481081 0.07272292 0.00816436
0.42910159
2943 0.91341065]
2944 -10498.329550266346
2945 -2940.459386606137
2946      [0.27591413 0.30972419 0.06550608 0.07344015 0.
0081628 0.42910212
2947 0.91371674]
2948      -10498.320322407275
2949 The 73 -th iteration of the EM(G) algorithm
2950 [0.27600422 0.30975426 0.06481081 0.07272292 0.00816436 0
.42910159
2951 0.91341065]
2952 -10483.191154744305
2953 -2940.3955378842884
2954
2955 M-step
2956 [0.27600422 0.30975426 0.06481081 0.07272292 0.00816436 0
.42910159
2957 0.91341065]
2958 -10483.191154744305
2959 -2940.3955378842884
2960      [0.28271872 0.31668101 0.05652637 0.06559279 0.
00831164 0.42919296
2961 0.91838962]
2962      -10497.628050836116
2963      [0.27936147 0.31321763 0.06066859 0.06915786 0.
008238 0.42914727
2964 0.91590014]
2965      -10486.520226780773
2966      [0.27768284 0.31148594 0.0627397 0.07094039 0.
00820118 0.42912443

```

```

2967 0.91465539]
2968      -10483.877221721039
2969      [0.27684353 0.3106201 0.06377525 0.07183165 0.
00818277 0.42911301
2970 0.91403302]
2971      -10483.288808985044
2972      [0.27642388 0.31018718 0.06429303 0.07227729 0.
00817357 0.4291073
2973 0.91372184]
2974      -10483.178542033023
2975
2976      [0.27642388 0.31018718 0.06429303 0.07227729 0.00817357
0.4291073
2977 0.91372184]
2978 -10483.178542033023
2979 -2940.3829251730067
2980      [0.27634186 0.3101637 0.0649682 0.07297726 0.
00818531 0.42911361
2981 0.91403014]
2982      -10483.168903946922
2983 The 74 -th iteration of the EM(G) algorithm
2984 [0.27642388 0.31018718 0.06429303 0.07227729 0.00817357 0
.4291073
2985 0.91372184]
2986 -10468.26083244026
2987 -2940.321878809459
2988
2989 M-step
2990 [0.27642388 0.31018718 0.06429303 0.07227729 0.00817357 0
.4291073
2991 0.91372184]
2992 -10468.26083244026
2993 -2940.321878809459
2994      [0.28305559 0.31706235 0.05617932 0.06525927 0.
00852984 0.42928923
2995 0.91873454]
2996      -10482.191271348196
2997      [0.27973973 0.31362476 0.06023618 0.06876828 0.
0083517 0.42919827
2998 0.91622819]
2999      -10471.469550062026
3000      [0.2780818 0.31190597 0.0622646 0.07052278 0.
00826264 0.42915278
3001 0.91497501]
3002      -10468.92027993991
3003      [0.27725284 0.31104657 0.06327882 0.07140004 0.
0082181 0.42913004
3004 0.91434843]
3005      -10468.353608503492
3006      [0.27683836 0.31061688 0.06378592 0.07183866 0.

```

```
3006 00819584 0.42911867
3007 0.91403513]
3008 -10468.247893779597
3009
3010 [0.27683836 0.31061688 0.06378592 0.07183866 0.00819584
      0.42911867
3011 0.91403513]
3012 -10468.247893779597
3013 -2940.308940148795
3014 [0.27676224 0.31059776 0.06444637 0.07252733 0.
      0082116 0.42912326
3015 0.91434417]
3016 -10468.237946165802
3017 The 75 -th iteration of the EM(G) algorithm
3018 [0.27683836 0.31061688 0.06378592 0.07183866 0.00819584 0
      .42911867
3019 0.91403513]
3020 -10453.476185916214
3021 -2940.249981885635
3022
3023 M-step
3024 [0.27683836 0.31061688 0.06378592 0.07183866 0.00819584 0
      .42911867
3025 0.91403513]
3026 -10453.476185916214
3027 -2940.249981885635
3028 [0.28339275 0.31744473 0.05582856 0.06492015 0.
      00861323 0.42927142
3029 0.91905814]
3030 -10466.953142640588
3031 [0.28011555 0.3140308 0.05980724 0.0683794 0.
      00840453 0.42919505
3032 0.91654664]
3033 -10456.577547153887
3034 [0.27847695 0.31232384 0.06179658 0.07010903 0.
      00830018 0.42915686
3035 0.91529088]
3036 -10454.11208868452
3037 [0.27765766 0.31147036 0.06279125 0.07097385 0.
      00824801 0.42913776
3038 0.91466301]
3039 -10453.56475870131
3040 [0.27724801 0.31104362 0.06328859 0.07140625 0.
      00822192 0.42912822
3041 0.91434907]
3042 -10453.463042341778
3043
3044 [0.27724801 0.31104362 0.06328859 0.07140625 0.00822192
      0.42912822
3045 0.91434907]
```

```
3046 -10453.463042341778
3047 -2940.2368383112
3048 [0.2771772 0.31102832 0.0639357 0.07208497 0.
      00823968 0.42913009
3049 0.91465841]
3050 -10453.452827299428
3051
3052 [0.2771772 0.31102832 0.0639357 0.07208497 0.00823968
      0.42913009
3053 0.91465841]
3054 -10453.452827299428
3055 -2940.22662326885
3056 [0.2775578 0.31147497 0.06338994 0.07145044 0.
      00819186 0.42909027
3057 0.9149479 ]
3058 -10453.445549324075
3059 The 76 -th iteration of the EM(G) algorithm
3060 [0.2771772 0.31102832 0.0639357 0.07208497 0.00823968 0
      .42913009
3061 0.91465841]
3062 -10454.432162466657
3063 -2940.2243390859476
3064
3065 M-step
3066 [0.2771772 0.31102832 0.0639357 0.07208497 0.00823968 0
      .42913009
3067 0.91465841]
3068 -10454.432162466657
3069 -2940.2243390859476
3070 [0.28377143 0.31790324 0.05585215 0.06501136 0.
      00747015 0.42848893
3071 0.91928982]
3072 -10468.413476915468
3073 [0.28047431 0.31446578 0.05989393 0.06854816 0.
      00785492 0.42880951
3074 0.91697411]
3075 -10457.657583714448
3076 [0.27882575 0.31274705 0.06191481 0.07031657 0.
      0080473 0.4289698
3077 0.91581626]
3078 -10455.097707776471
3079 [0.27800148 0.31188769 0.06292525 0.07120077 0.
      00814349 0.42904994
3080 0.91523733]
3081 -10454.527417216212
3082 [0.27758934 0.311458 0.06343048 0.07164287 0.
      00819159 0.42909001
3083 0.91494787]
3084 -10454.420319776636
3085
```

```
3086 [0.27758934 0.311458 0.06343048 0.07164287 0.00819159  
      0.42909001  
3087 0.91494787]  
3088 -10454.420319776636  
3089 -2940.212496395927  
3090 [0.2775139 0.3114368 0.06408911 0.0723371 0.  
      00819025 0.42909029  
3091 0.91524093]  
3092 -10454.411052352762  
3093 The 77 -th iteration of the EM(G) algorithm  
3094 [0.27758934 0.311458 0.06343048 0.07164287 0.00819159 0  
      .42909001  
3095 0.91494787]  
3096 -10439.582535850208  
3097 -2940.1536595665593  
3098  
3099 M-step  
3100 [0.27758934 0.311458 0.06343048 0.07164287 0.00819159 0  
      .42909001  
3101 0.91494787]  
3102 -10439.582535850208  
3103 -2940.1536595665593  
3104 [0.28408932 0.31826761 0.05555743 0.06472794 0.  
      0083329 0.42917258  
3105 0.91971404]  
3106 -10452.890766057782  
3107 [0.28083933 0.31486281 0.05949395 0.06818541 0.  
      00826224 0.4291313  
3108 0.91733095]  
3109 -10442.64783130696  
3110 [0.27921433 0.31316041 0.06146221 0.06991414 0.  
      00822692 0.42911066  
3111 0.91613941]  
3112 -10440.212543886699  
3113 [0.27840183 0.3123092 0.06244634 0.0707785 0.  
      00820925 0.42910034  
3114 0.91554364]  
3115 -10439.671203782964  
3116 [0.27799559 0.3118836 0.06293841 0.07121069 0.  
      00820042 0.42909518  
3117 0.91524576]  
3118 -10439.5702014748  
3119  
3120 [0.27799559 0.3118836 0.06293841 0.07121069 0.00820042  
      0.42909518  
3121 0.91524576]  
3122 -10439.5702014748  
3123 -2940.1413251911517  
3124 [0.27792754 0.3118686 0.06357838 0.07188854 0.  
      00821168 0.42910096
```

```
3125 0.91554091]
3126      -10439.560586100675
3127 The 78 -th iteration of the EM(G) algorithm
3128 [0.27799559 0.3118836 0.06293841 0.07121069 0.00820042 0
     .42909518
3129 0.91524576]
3130 -10424.949132570942
3131 -2940.085015210175
3132
3133 M-step
3134 [0.27799559 0.3118836 0.06293841 0.07121069 0.00820042 0
     .42909518
3135 0.91524576]
3136 -10424.949132570942
3137 -2940.085015210175
3138      [0.28441846 0.31864372 0.05522477 0.06440342 0.
     00853981 0.42926414
3139 0.92004395]
3140      -10437.800065420075
3141      [0.28120702 0.31526366 0.05908159 0.06780705 0.
     00837011 0.42917966
3142 0.91764485]
3143      -10427.90581447973
3144      [0.2796013 0.31357363 0.06101      0.06950887 0.
     00828527 0.42913742
3145 0.9164453 ]
3146      -10425.555139908207
3147      [0.27879844 0.31272862 0.0619742 0.07035978 0.
     00824284 0.4291163
3148 0.91584553]
3149      -10425.033413608116
3150      [0.27839701 0.31230611 0.06245631 0.07078523 0.
     00822163 0.42910574
3151 0.91554564]
3152      -10424.936512713844
3153
3154 [0.27839701 0.31230611 0.06245631 0.07078523 0.00822163
     0.42910574
3155 0.91554564]
3156 -10424.936512713844
3157 -2940.072395353077
3158      [0.27833434 0.31229521 0.06308263 0.07145227 0.
     0082367 0.42910992
3159 0.9158415 ]
3160      -10424.926633538174
3161 The 79 -th iteration of the EM(G) algorithm
3162 [0.27839701 0.31230611 0.06245631 0.07078523 0.00822163 0
     .42910574
3163 0.91554564]
3164 -10410.460417236376
```

```
3165 -2940.017970947677
3166
3167 M-step
3168 [0.27839701 0.31230611 0.06245631 0.07078523 0.00822163 0
     .42910574
3169 0.91554564]
3170 -10410.460417236376
3171 -2940.017970947677
3172      [0.28474783 0.31902074 0.05488865 0.06407384 0.
     00861888 0.42924744
3173 0.92035361]
3174      -10422.901356687507
3175      [0.28157242 0.31566343 0.05867248 0.06742954 0.
     00842025 0.42917659
3176 0.91794963]
3177      -10413.320090882762
3178      [0.27998472 0.31398477 0.06056439 0.06910738 0.
     00832094 0.42914116
3179 0.91674763]
3180      -10411.045169562824
3181      [0.27919087 0.31314544 0.06151035 0.06994631 0.
     00827129 0.42912345
3182 0.91614664]
3183      -10410.540914390647
3184      [0.27879394 0.31272578 0.06198333 0.07036577 0.
     00824646 0.42911459
3185 0.91584614]
3186      -10410.447620251147
3187
3188      [0.27879394 0.31272578 0.06198333 0.07036577 0.00824646
     0.42911459
3189 0.91584614]
3190 -10410.447620251147
3191 -2940.0051739624478
3192      [0.2787361 0.31271849 0.06259729 0.07102325 0.
     00826341 0.42911621
3193 0.91614228]
3194      -10410.43751292524
3195
3196      [0.2787361 0.31271849 0.06259729 0.07102325 0.00826341
     0.42911621
3197 0.91614228]
3198 -10410.43751292524
3199 -2939.995066636541
3200      [0.27909924 0.31315291 0.06209122 0.07041825 0.
     00821791 0.42907816
3201 0.9164195 ]
3202      -10410.430062544001
3203 The 80 -th iteration of the EM(G) algorithm
3204 [0.2787361 0.31271849 0.06259729 0.07102325 0.00826341 0
```

```
3204 .42911621
3205 0.91614228]
3206 -10411.278531231412
3207 -2939.9929518219396
3208
3209 M-step
3210 [0.2787361 0.31271849 0.06259729 0.07102325 0.00826341 0
     .42911621
3211 0.91614228]
3212 -10411.278531231412
3213 -2939.9929518219396
3214 [0.28512316 0.31947661 0.05491266 0.06416634 0.
     00753303 0.42850439
3215 0.92057828]
3216 -10424.171078337258
3217 [0.28192963 0.31609755 0.05875497 0.0675948 0.
     00789822 0.4288103
3218 0.91836028]
3219 -10414.249328112815
3220 [0.28033287 0.31440802 0.06067613 0.06930902 0.
     00808082 0.42896325
3221 0.91725128]
3222 -10411.889859503328
3223 [0.27953449 0.31356325 0.06163671 0.07016614 0.
     00817211 0.42903973
3224 0.91669678]
3225 -10411.365032604022
3226 [0.27913529 0.31314087 0.062117 0.0705947 0.
     00821776 0.42907797
3227 0.91641953]
3228 -10411.266910778706
3229
3230 [0.27913529 0.31314087 0.062117 0.0705947 0.00821776
     0.42907797
3231 0.91641953]
3232 -10411.266910778706
3233 -2939.981331369234
3234 [0.27907321 0.31312808 0.06274157 0.07126667 0.
     00821655 0.4290781
3235 0.91670021]
3236 -10411.257648922598
3237 The 81 -th iteration of the EM(G) algorithm
3238 [0.27913529 0.31314087 0.062117 0.0705947 0.00821776 0
     .42907797
3239 0.91641953]
3240 -10396.733213139665
3241 -2939.927035013183
3242
3243 M-step
3244 [0.27913529 0.31314087 0.062117 0.0705947 0.00821776 0
```

```
3244 .42907797
3245 0.91641953]
3246 -10396.733213139665
3247 -2939.927035013183
3248 [0.28543439 0.31983667 0.05462931 0.06388918 0.
00835228 0.42915379
3249 0.92098372]
3250 -10409.017842253981
3251 [0.28228484 0.31648877 0.05837316 0.06724194 0.
00828502 0.42911588
3252 0.91870162]
3253 -10399.559442274542
3254 [0.28071007 0.31481482 0.06024508 0.06891832 0.
00825139 0.42909693
3255 0.91756058]
3256 -10397.312478190473
3257 [0.27992268 0.31397785 0.06118104 0.06975651 0.
00823458 0.42908745
3258 0.91699005]
3259 -10396.813782563557
3260 [0.27952899 0.31355936 0.06164902 0.0701756 0.
00822617 0.42908271
3261 0.91670479]
3262 -10396.721157161517
3263
3264 [0.27952899 0.31355936 0.06164902 0.0701756 0.00822617
0.42908271
3265 0.91670479]
3266 -10396.721157161517
3267 -2939.914979035035
3268 [0.27947367 0.31355239 0.06225625 0.07083202 0.
00823691 0.42908809
3269 0.91698747]
3270 -10396.711600956842
3271 The 82 -th iteration of the EM(G) algorithm
3272 [0.27952899 0.31355936 0.06164902 0.0701756 0.00822617 0
.42908271
3273 0.91670479]
3274 -10382.399822972435
3275 -2939.862965385598
3276
3277 M-step
3278 [0.27952899 0.31355936 0.06164902 0.0701756 0.00822617 0
.42908271
3279 0.91670479]
3280 -10382.399822972435
3281 -2939.862965385598
3282 [0.28575613 0.32020771 0.05431032 0.06357354 0.
0085487 0.42924085
3283 0.92129945]
```

```

3284      -10394.270741536671
3285      [0.28264256 0.31688353 0.05797967 0.06687457 0.
00838744 0.42916178
3286 0.91900212]
3287      -10385.127843573897
3288      [0.28108577 0.31522145 0.05981434 0.06852509 0.
0083068 0.42912225
3289 0.91785345]
3290      -10382.957406508245
3291      [0.28030738 0.3143904 0.06073168 0.06935034 0.
00826649 0.42910248
3292 0.91727912]
3293      -10382.476439769242
3294      [0.27991818 0.31397488 0.06119035 0.06976297 0.
00824633 0.42909259
3295 0.91699195]
3296      -10382.38751675649
3297
3298 [0.27991818 0.31397488 0.06119035 0.06976297 0.00824633
0.42909259
3299 0.91699195]
3300 -10382.38751675649
3301 -2939.8506591696523
3302      [0.27986777 0.31397178 0.06178492 0.07040904 0.
00826069 0.42909646
3303 0.9172753 ]
3304      -10382.377735734319
3305 The 83 -th iteration of the EM(G) algorithm
3306 [0.27991818 0.31397488 0.06119035 0.06976297 0.00824633 0
.42909259
3307 0.91699195]
3308 -10368.209674745374
3309 -2939.800351525829
3310
3311 M-step
3312 [0.27991818 0.31397488 0.06119035 0.06976297 0.00824633 0
.42909259
3313 0.91699195]
3314 -10368.209674745374
3315 -2939.800351525829
3316      [0.28607804 0.32057943 0.05398812 0.06325316 0.
00862382 0.42922513
3317 0.92159595]
3318      -10379.709376780855
3319      [0.28299811 0.31727716 0.05758923 0.06650806 0.
00843507 0.42915886
3320 0.91929395]
3321      -10370.849911550908
3322      [0.28145815 0.31562602 0.05938979 0.06813552 0.
0083407 0.42912573

```

```

3323 0.91814295]
3324          -10368.748043779478
3325          [0.28068817 0.31480045 0.06029007 0.06894924 0.
3326          00829351 0.42910916
3327 0.91756745]
3328          -10368.282881165307
3329          [0.28030317 0.31438767 0.06074021 0.06935611 0.
3330          00826992 0.42910088
3331          0.9172797 ]
3332          -10368.197215991564
3333 0.9172797 ]
3334 -10368.197215991564
3335 -2939.7878927720185
3336          [0.28025717 0.31438798 0.06132332 0.06999302 0.
3337          00828607 0.42910232
3338 0.91756332]
3339          -10368.187240895313
3340 The 84 -th iteration of the EM(G) algorithm
3341 [0.28030317 0.31438767 0.06074021 0.06935611 0.00826992 0
3342          .42910088
3343          0.9172797 ]
3344 -10354.14800370758
3345 -2939.7391264417
3346 M-step
3347 [0.28030317 0.31438767 0.06074021 0.06935611 0.00826992 0
3348          .42910088
3349 0.9172797 ]
3350 -10354.14800370758
3351 -2939.7391264417
3352          [0.28639817 0.32095002 0.05366891 0.06293458 0.
3353          00867326 0.42919333
3354 0.92188673]
3355          -10365.29699633948
3356          [0.28335067 0.31766884 0.05720456 0.06614534 0.
3357          00847159 0.4291471
3358 0.91958322]
3359          -10356.705417895666
3360          [0.28182692 0.31602825 0.05897238 0.06775073 0.
3361          00837076 0.42912399
3362 0.91843146]
3363          -10354.668298477492
3364          [0.28106505 0.31520796 0.0598563 0.06855342 0.
3365          00832034 0.42911243
3366 0.91785558]
3367          -10354.218032639807
3368          [0.28068411 0.31479781 0.06029825 0.06895476 0.

```

```
3362 00829513 0.42910666
3363 0.91756764]
3364 -10354.135424286349
3365
3366 [0.28068411 0.31479781 0.06029825 0.06895476 0.00829513
      0.42910666
3367 0.91756764]
3368 -10354.135424286349
3369 -2939.7265470204693
3370 [0.2806423 0.31480137 0.06087041 0.06958293 0.
      00831249 0.42910582
3371 0.91785132]
3372 -10354.125276057403
3373
3374 [0.2806423 0.31480137 0.06087041 0.06958293 0.00831249
      0.42910582
3375 0.91785132]
3376 -10354.125276057403
3377 -2939.716398791523
3378 [0.28098388 0.31521935 0.06041379 0.06901842 0.
      00827107 0.42906812
3379 0.9181171 ]
3380 -10354.117475205563
3381 The 85 -th iteration of the EM(G) algorithm
3382 [0.2806423 0.31480137 0.06087041 0.06958293 0.00831249 0
      .42910582
3383 0.91785132]
3384 -10354.775899920001
3385 -2939.714479387564
3386
3387 M-step
3388 [0.2806423 0.31480137 0.06087041 0.06958293 0.00831249 0
      .42910582
3389 0.91785132]
3390 -10354.775899920001
3391 -2939.714479387564
3392 [0.28676992 0.32140355 0.05369168 0.06302611 0.
      00765011 0.42850077
3393 0.92210549]
3394 -10366.319014871622
3395 [0.28370611 0.31810246 0.05728104 0.06630452 0.
      0079813 0.42880329
3396 0.9199784 ]
3397 -10357.430424052138
3398 [0.2821742 0.31645192 0.05907572 0.06794373 0.
      00814689 0.42895456
3399 0.91891486]
3400 -10355.319490824764
3401 [0.28140825 0.31562664 0.05997307 0.06876333 0.
      00822969 0.42903019
```

```
3402 0.91838309]
3403          -10354.85123020747
3404          [0.28102527 0.31521401 0.06042174 0.06917313 0.
3405 0.0827109 0.429068
3405 0.9181172 ]
3406          -10354.764380521785
3407
3408  [0.28102527 0.31521401 0.06042174 0.06917313 0.00827109
3409 0.429068
3409 0.9181172 ]
3410 -10354.764380521785
3411 -2939.7029599893476
3412          [0.28097961 0.31521251 0.06100351 0.06981466 0.
3413 0.0827099 0.42906629
3413 0.91838618]
3414          -10354.754982576424
3415 The 86 -th iteration of the EM(G) algorithm
3416 [0.28102527 0.31521401 0.06042174 0.06917313 0.00827109 0
3417 0.429068
3417 0.9181172 ]
3418 -10340.660957245736
3419 -2939.6542792892405
3420
3421 M-step
3422 [0.28102527 0.31521401 0.06042174 0.06917313 0.00827109 0
3423 0.429068
3423 0.9181172 ]
3424 -10340.660957245736
3425 -2939.6542792892405
3426          [0.28707281 0.32175792 0.05342263 0.06275747 0.
3427 0.084124 0.42910894
3427 0.9224891 ]
3428          -10351.676217671353
3429          [0.28404904 0.31848597 0.05692218 0.0659653 0.
3430 0.0834175 0.42908847
3430 0.92030315]
3431          -10343.190033631501
3432          [0.28253716 0.31684999 0.05867196 0.06756922 0.
3433 0.0830642 0.42907824
3433 0.91921018]
3434          -10341.176759300659
3435          [0.28178121 0.316032    0.05954685 0.06837117 0.
3436 0.0828875 0.42907312
3436 0.91866369]
3437          -10340.731164378285
3438          [0.28140324 0.315623    0.05998429 0.06877215 0.
3439 0.0827992 0.42907056
3439 0.91839045]
3440          -10340.649073753186
3441
```

```

3442 [0.28140324 0.315623 0.05998429 0.06877215 0.00827992
      0.42907056
3443 0.91839045]
3444 -10340.649073753186
3445 -2939.64239579669
3446 [0.28136359 0.31562682 0.0605504 0.06939925 0.
      00829077 0.42907398
3447 0.91866115]
3448 -10340.63944808433
3449 The 87 -th iteration of the EM(G) algorithm
3450 [0.28140324 0.315623 0.05998429 0.06877215 0.00827992 0
      .42907056
3451 0.91839045]
3452 -10326.750450929789
3453 -2939.5956974213777
3454
3455 M-step
3456 [0.28140324 0.315623 0.05998429 0.06877215 0.00827992 0
      .42907056
3457 0.91839045]
3458 -10326.750450929789
3459 -2939.5956974213777
3460 [0.28738532 0.32212237 0.05312079 0.0624535 0.
      00859356 0.42919204
3461 0.9227887 ]
3462 -10337.406297530591
3463 [0.28439428 0.31887268 0.05655254 0.06561282 0.
      00843674 0.4291313
3464 0.92058957]
3465 -10329.194291789885
3466 [0.28289876 0.31724784 0.05826842 0.06719249 0.
      00835833 0.42910093
3467 0.91949001]
3468 -10327.247470301534
3469 [0.282151 0.31643542 0.05912635 0.06798232 0.
      00831912 0.42908575
3470 0.91894023]
3471 -10326.81725249468
3472 [0.28177712 0.31602921 0.05955532 0.06837724 0.
      00829952 0.42907815
3473 0.91866534]
3474 -10326.738364462642
3475
3476 [0.28177712 0.31602921 0.05955532 0.06837724 0.00829952
      0.42907815
3477 0.91866534]
3478 -10326.738364462642
3479 -2939.5836109542315
3480 [0.2817418 0.31603657 0.06011003 0.06899468 0.
      00831358 0.42908037

```

```
3481 0.91893654]
3482      -10326.728564662739
3483 The 88 -th iteration of the EM(G) algorithm
3484 [0.28177712 0.31602921 0.05955532 0.06837724 0.00829952 0
     .42907815
3485 0.91866534]
3486 -10312.97941857195
3487 -2939.5383953275204
3488
3489 M-step
3490 [0.28177712 0.31602921 0.05955532 0.06837724 0.00829952 0
     .42907815
3491 0.91866534]
3492 -10312.97941857195
3493 -2939.5383953275204
3494      [0.28769791 0.3224874 0.05281609 0.06214537 0.
     00866189 0.42917915
3495 0.92307037]
3496      -10323.312191883031
3497      [0.28473752 0.3192583 0.05618571 0.0652613 0.
     00848071 0.42912865
3498 0.92086786]
3499      -10315.34693982584
3500      [0.28325732 0.31764376 0.05787051 0.06681927 0.
     00839011 0.4291034
3501 0.9197666 ]
3502      -10313.45976666781
3503      [0.28251722 0.31683649 0.05871292 0.06759825 0.
     00834482 0.42909078
3504 0.91921597]
3505      -10313.043279556441
3506      [0.28214717 0.31643285 0.05913412 0.06798774 0.
     00832217 0.42908447
3507 0.91894065]
3508      -10312.96721343796
3509
3510 [0.28214717 0.31643285 0.05913412 0.06798774 0.00832217
     0.42908447
3511 0.91894065]
3512 -10312.96721343796
3513 -2939.526190193531
3514      [0.28211573 0.31644335 0.0596785 0.06859663 0.
     00833776 0.42908461
3515 0.91921199]
3516      -10312.95726409489
3517 The 89 -th iteration of the EM(G) algorithm
3518 [0.28214717 0.31643285 0.05913412 0.06798774 0.00832217 0
     .42908447
3519 0.91894065]
3520 -10299.333903762586
```

```
3521 -2939.4823166389797
3522
3523 M-step
3524 [0.28214717 0.31643285 0.05913412 0.06798774 0.00832217 0
     .42908447
3525 0.91894065]
3526 -10299.333903762586
3527 -2939.4823166389797
3528      [0.28800882 0.32285118 0.05251416 0.06183897 0.
     00870648 0.42915103
3529 0.92334674]
3530      -10309.361083490428
3531      [0.285078 0.31964201 0.05582414 0.06491336 0.
     00851433 0.42911775
3532 0.9211437 ]
3533      -10301.629335384136
3534      [0.28361258 0.31803743 0.05747913 0.06645055 0.
     00841825 0.42910111
3535 0.92004217]
3536      -10299.79855381894
3537      [0.28287988 0.31723514 0.05830663 0.06721915 0.
     00837021 0.42909279
3538 0.91949141]
3539      -10299.395023573577
3540      [0.28251353 0.31683399 0.05872037 0.06760345 0.
     00834619 0.42908863
3541 0.91921603]
3542      -10299.321607641452
3543
3544      [0.28251353 0.31683399 0.05872037 0.06760345 0.00834619
     0.42908863
3545 0.91921603]
3546 -10299.321607641452
3547 -2939.470020517845
3548      [0.28248578 0.31684747 0.05925488 0.06820414 0.
     00836279 0.4290868
3549 0.91948733]
3550      -10299.311525857878
3551
3552      [0.28248578 0.31684747 0.05925488 0.06820414 0.00836279
     0.4290868
3553 0.91948733]
3554 -10299.311525857878
3555 -2939.4599387342714
3556      [0.28280826 0.31725022 0.0588421 0.06767723 0.
     0083242 0.42905056
3557 0.91974173]
3558      -10299.303544549395
3559 The 90 -th iteration of the EM(G) algorithm
3560 [0.28248578 0.31684747 0.05925488 0.06820414 0.00836279 0
```

```
3560 .4290868
3561 0.91948733]
3562 -10299.785281639937
3563 -2939.458173429676
3564
3565 M-step
3566 [0.28248578 0.31684747 0.05925488 0.06820414 0.00836279 0
     .4290868
3567 0.91948733]
3568 -10299.785281639937
3569 -2939.458173429676
3570      [0.28837662 0.32330196 0.05253681 0.06193032 0.
     00774763 0.42850629
3571 0.92356038]
3572      -10310.155371018345
3573      [0.2854312 0.32007472 0.05589584 0.06506723 0.
     00805521 0.42879655
3574 0.92152385]
3575      -10302.16529691114
3576      [0.28395849 0.3184611 0.05757536 0.06663569 0.
     008209 0.42894167
3577 0.92050559]
3578      -10300.270274768427
3579      [0.28322214 0.31765428 0.05841512 0.06741991 0.
     0082859 0.42901424
3580 0.91999646]
3581      -10299.851058627319
3582      [0.28285396 0.31725088 0.058835 0.06781203 0.
     00832434 0.42905052
3583 0.91974189]
3584      -10299.773932139873
3585
3586      [0.28285396 0.31725088 0.058835 0.06781203 0.00832434
     0.42905052
3587 0.91974189]
3588 -10299.773932139873
3589 -2939.446823929612
3590      [0.28282274 0.31725973 0.05937819 0.06842496 0.
     00832443 0.42904813
3591 0.91999928]
3592      -10299.764512414582
3593 The 91 -th iteration of the EM(G) algorithm
3594 [0.28285396 0.31725088 0.058835 0.06781203 0.00832434 0
     .42905052
3595 0.91974189]
3596 -10286.093483837356
3597 -2939.4030297793515
3598
3599 M-step
3600 [0.28285396 0.31725088 0.058835 0.06781203 0.00832434 0
```

```
3600 .42905052
3601 0.91974189]
3602 -10286.093483837356
3603 -2939.4030297793515
3604 [0.28867156 0.32365087 0.05228138 0.06167025 0.
    00845873 0.4290757
3605 0.92392377]
3606 -10296.002867568051
3607 [0.28576276 0.32045088 0.05555819 0.06474114 0.
    00839154 0.42906311
3608 0.92183283]
3609 -10288.364080955616
3610 [0.28430836 0.31885088 0.05719659 0.06627658 0.
    00835794 0.42905681
3611 0.92078736]
3612 -10286.554268762688
3613 [0.28358116 0.31805088 0.0580158 0.0670443 0.
    00834114 0.42905367
3614 0.92026463]
3615 -10286.154813639667
3616 [0.28321756 0.31765088 0.0584254 0.06742817 0.
    00833274 0.42905209
3617 0.92000326]
3618 -10286.08182891677
3619
3620 [0.28321756 0.31765088 0.0584254 0.06742817 0.00833274
    0.42905209
3621 0.92000326]
3622 -10286.08182891677
3623 -2939.3913748587647
3624 [0.28319171 0.3176646 0.05895438 0.06802769 0.
    00834298 0.4290546
3625 0.92026217]
3626 -10286.072234049947
3627 The 92 -th iteration of the EM(G) algorithm
3628 [0.28321756 0.31765088 0.0584254 0.06742817 0.00833274 0
    .42905209
3629 0.92000326]
3630 -10272.5987516197
3631 -2939.349311308437
3632
3633 M-step
3634 [0.28321756 0.31765088 0.0584254 0.06742817 0.00833274 0
    .42905209
3635 0.92000326]
3636 -10272.5987516197
3637 -2939.349311308437
3638 [0.28897528 0.32400881 0.05199568 0.06137764 0.
    00862688 0.42915433
3639 0.92420842]
```

```

3640      -10282.194033686425
3641      [0.28609642 0.32082984 0.05521054 0.0644029 0.
00847981 0.42910321
3642 0.92210584]
3643      -10274.794930733497
3644      [0.28465699 0.31924036 0.05681797 0.06591553 0.
00840628 0.42907765
3645 0.92105455]
3646      -10273.043167588541
3647      [0.28393728 0.31844562 0.05762168 0.06667185 0.
00836951 0.42906487
3648 0.9205289 ]
3649      -10272.657129565074
3650      [0.28357742 0.31804825 0.05802354 0.06705001 0.
00835113 0.42905848
3651 0.92026608]
3652      -10272.586931744554
3653
3654 [0.28357742 0.31804825 0.05802354 0.06705001 0.00835113
0.42905848
3655 0.92026608]
3656 -10272.586931744554
3657 -2939.337491433291
3658      [0.2835554 0.31806523 0.05854222 0.06764051 0.
0083643 0.42905997
3659 0.92052538]
3660      -10272.577202529576
3661 The 93 -th iteration of the EM(G) algorithm
3662 [0.28357742 0.31804825 0.05802354 0.06705001 0.00835113 0
.42905848
3663 0.92026608]
3664 -10259.239707749002
3665 -2939.296724176913
3666
3667 M-step
3668 [0.28357742 0.31804825 0.05802354 0.06705001 0.00835113 0
.42905848
3669 0.92026608]
3670 -10259.239707749002
3671 -2939.296724176913
3672      [0.28927912 0.32436728 0.05170741 0.06108132 0.
00868982 0.42914319
3673 0.9244763 ]
3674      -10268.552310724448
3675      [0.28642827 0.32120777 0.05486548 0.06406567 0.
00852047 0.42910084
3676 0.92237119]
3677      -10261.369176892931
3678      [0.28500284 0.31962801 0.05644451 0.06555784 0.
0084358 0.42907966

```

```
3679 0.92131864]
3680          -10259.669580474942
3681          [0.28429013 0.31883813 0.05723402 0.06630392 0.
3682          00839346 0.42906907
3683 0.92079236]
3684          -10259.295536214931
3685          [0.28393377 0.31844319 0.05762878 0.06667697 0.
3686          00837229 0.42906378
3687 0.92052922]
3688          -10259.227796064879
3689 0.92052922]
3690 -10259.227796064879
3691 -2939.2848124927896
3692          [0.28391519 0.31846305 0.05813813 0.06725943 0.
3693          00838684 0.42906341
3694 0.92078857]
3695          -10259.217952142488
3696 The 94 -th iteration of the EM(G) algorithm
3697 [0.28393377 0.31844319 0.05762878 0.06667697 0.00837229 0
3698          .42906378
3699 0.92052922]
3700 -10246.003056214198
3701 -2939.2452200035214
3702 M-step
3703 [0.28393377 0.31844319 0.05762878 0.06667697 0.00837229 0
3704          .42906378
3705 0.92052922]
3706 -10246.003056214198
3707 -2939.2452200035214
3708          [0.28958131 0.32472459 0.05142173 0.06078677 0.
3709          00873068 0.42911773
3710 0.92473921]
3711          -10255.047914147697
3712          [0.28675754 0.32158389 0.05452525 0.06373187 0.
3713          00855148 0.42909076
3714 0.92263421]
3715          -10248.069428806482
3716          [0.28534566 0.32001354 0.05607702 0.06520442 0.
3717          00846189 0.42907727
3718 0.92158172]
3719          -10246.419217212846
3720          [0.28463972 0.31922836 0.0568529 0.06594069 0.
3721          00841709 0.42907052
3722 0.92105547]
3723          -10246.056505694618
3724          [0.28428674 0.31883578 0.05724084 0.06630883 0.
```

```
3718 00839469 0.42906715
3719 0.92079234]
3720 -10245.991076469509
3721
3722 [0.28428674 0.31883578 0.05724084 0.06630883 0.00839469
      0.42906715
3723 0.92079234]
3724 -10245.991076469509
3725 -2939.2332402588318
3726 [0.28427143 0.31885838 0.05774126 0.06688361 0.
      00841014 0.42906502
3727 0.92105157]
3728 -10245.981132192494
3729 The 95 -th iteration of the EM(G) algorithm
3730 [0.28428674 0.31883578 0.05724084 0.06630883 0.00839469 0
      .42906715
3731 0.92079234]
3732 -10232.884736204333
3733 -2939.194761750473
3734
3735 M-step
3736 [0.28428674 0.31883578 0.05724084 0.06630883 0.00839469 0
      .42906715
3737 0.92079234]
3738 -10232.884736204333
3739 -2939.194761750473
3740 [0.28988161 0.32508041 0.05113962 0.06049491 0.
      00876527 0.42909178
3741 0.92499944]
3742 -10241.673408176763
3743 [0.28708418 0.32195809 0.05419023 0.06340187 0.
      00857998 0.42907946
3744 0.92289589]
3745 -10234.89078396802
3746 [0.28568546 0.32039693 0.05571553 0.06485535 0.
      00848734 0.42907331
3747 0.92184412]
3748 -10233.287810966875
3749 [0.2849861 0.31961636 0.05647819 0.06558209 0.
      00844101 0.42907023
3750 0.92131823]
3751 -10232.935928305778
3752 [0.28463642 0.31922607 0.05685951 0.06594546 0.
      00841785 0.42906869
3753 0.92105529]
3754 -10232.87270128714
3755
3756 [0.28463642 0.31922607 0.05685951 0.06594546 0.00841785
      0.42906869
3757 0.92105529]
```

```
3758 -10232.87270128714
3759 -2939.182726833281
3760 [0.28462426 0.31925132 0.05735129 0.06651277 0.
      00843395 0.42906502
3761 0.92131427]
3762 -10232.862669004182
3763
3764 [0.28462426 0.31925132 0.05735129 0.06651277 0.00843395
      0.42906502
3765 0.92131427]
3766 -10232.862669004182
3767 -2939.1726945503224
3768 [0.28492551 0.31963594 0.05698741 0.06603106 0.
      00839888 0.42902986
3769 0.92155746]
3770 -10232.85449957117
3771 The 96 -th iteration of the EM(G) algorithm
3772 [0.28462426 0.31925132 0.05735129 0.06651277 0.00843395 0
      .42906502
3773 0.92131427]
3774 -10233.124334157428
3775 -2939.171081043163
3776
3777 M-step
3778 [0.28462426 0.31925132 0.05735129 0.06651277 0.00843395 0
      .42906502
3779 0.92131427]
3780 -10233.124334157428
3781 -2939.171081043163
3782 [0.2902448 0.32552824 0.05116168 0.0605848 0.
      00787751 0.42850288
3783 0.92520889]
3784 -10242.20333597039
3785 [0.28743453 0.32238978 0.05425649 0.06354879 0.
      00815573 0.42878395
3786 0.92326158]
3787 -10235.202132697888
3788 [0.2860294 0.32082055 0.05580389 0.06503078 0.
      00829484 0.42892448
3789 0.92228793]
3790 -10233.544740198087
3791 [0.28532683 0.32003593 0.05657759 0.06577178 0.
      00836439 0.42899475
3792 0.9218011 ]
3793 -10233.17953355543
3794 [0.28497554 0.31964363 0.05696444 0.06614228 0.
      00839917 0.42902989
3795 0.92155769]
3796 -10233.11313552842
3797
```

```
3798 [0.28497554 0.31964363 0.05696444 0.06614228 0.00839917  
      0.42902989  
3799 0.92155769]  
3800 -10233.11313552842  
3801 -2939.1598824141547  
3802      [0.2849603 0.31966471 0.05746393 0.06672062 0.  
      00839968 0.42902618  
3803 0.92180354]  
3804      -10233.103682304278  
3805 The 97 -th iteration of the EM(G) algorithm  
3806 [0.28497554 0.31964363 0.05696444 0.06614228 0.00839917 0  
      .42902989  
3807 0.92155769]  
3808 -10219.965208340927  
3809 -2939.1214636804834  
3810  
3811 M-step  
3812 [0.28497554 0.31964363 0.05696444 0.06614228 0.00839917 0  
      .42902989  
3813 0.92155769]  
3814 -10219.965208340927  
3815 -2939.1214636804834  
3816      [0.29053051 0.32587034 0.0509221 0.06033535 0.  
      00852916 0.42902855  
3817 0.92554997]  
3818      -10228.65561430179  
3819      [0.28775303 0.32275699 0.05394327 0.06323881 0.  
      00846416 0.42902922  
3820 0.92355383]  
3821      -10221.950802513995  
3822      [0.28636429 0.32120031 0.05545386 0.06469054 0.  
      00843167 0.42902955  
3823 0.92255576]  
3824      -10220.365252820982  
3825      [0.28566992 0.32042197 0.05620915 0.06541641 0.  
      00841542 0.42902972  
3826 0.92205672]  
3827      -10220.016687756757  
3828      [0.28532273 0.3200328 0.0565868 0.06577934 0.  
      00840729 0.4290298  
3829 0.9218072 ]  
3830      -10219.953768110674  
3831  
3832 [0.28532273 0.3200328 0.0565868 0.06577934 0.00840729  
      0.4290298  
3833 0.9218072 ]  
3834 -10219.953768110674  
3835 -2939.11002345023  
3836      [0.28531214 0.32005824 0.05707372 0.06634549 0.  
      00841698 0.42903082
```

```
3837 0.9220543 ]
3838          -10219.944194460433
3839 The 98 -th iteration of the EM(G) algorithm
3840 [0.28532273 0.3200328 0.0565868 0.06577934 0.00840729 0
     .4290298
3841 0.9218072 ]
3842 -10206.99308669275
3843 -2939.0730648821136
3844
3845 M-step
3846 [0.28532273 0.3200328 0.0565868 0.06577934 0.00840729 0
     .4290298
3847 0.9218072 ]
3848 -10206.99308669275
3849 -2939.0730648821136
3850          [0.29082409 0.32622058 0.05065514 0.06005654 0.
     00868167 0.4291027
3851 0.92581834]
3852          -10215.418358219073
3853          [0.28807341 0.32312669 0.05362097 0.06291794 0.
     00854448 0.42906625
3854 0.92381277]
3855          -10208.915952185624
3856          [0.28669807 0.32157974 0.05510388 0.06434864 0.
     00847589 0.42904803
3857 0.92280999]
3858          -10207.37937166197
3859          [0.2860104 0.32080627 0.05584534 0.06506399 0.
     00844159 0.42903891
3860 0.9223086 ]
3861          -10207.0421056191
3862          [0.28566657 0.32041953 0.05621607 0.06542167 0.
     00842444 0.42903436
3863 0.9220579 ]
3864          -10206.981523285895
3865
3866 [0.28566657 0.32041953 0.05621607 0.06542167 0.00842444
     0.42903436
3867 0.9220579 ]
3868 -10206.981523285895
3869 -2939.0615014752584
3870          [0.28565927 0.32044789 0.05669391 0.06597956 0.
     00843669 0.42903462
3871 0.9223052 ]
3872          -10206.97185749991
3873 The 99 -th iteration of the EM(G) algorithm
3874 [0.28566657 0.32041953 0.05621607 0.06542167 0.00842444 0
     .42903436
3875 0.9220579 ]
3876 -10194.1508643081
```

```
3877 -2939.025637854643
3878
3879 M-step
3880 [0.28566657 0.32041953 0.05621607 0.06542167 0.00842444 0
     .42903436
3881 0.9220579 ]
3882 -10194.1508643081
3883 -2939.025637854643
3884      [0.29111767 0.3265712 0.05038591 0.05977455 0.
     00873775 0.42909413
3885 0.92607125]
3886      -10202.337081085743
3887      [0.28839212 0.32349537 0.05330099 0.06259811 0.
     0085811 0.42906424
3888 0.92406458]
3889      -10196.017399141345
3890      [0.28702934 0.32195745 0.05475853 0.06400989 0.
     00850277 0.4290493
3891 0.92306124]
3892      -10194.52490639879
3893      [0.28634795 0.32118849 0.0554873 0.06471578 0.
     00846361 0.42904183
3894 0.92255957]
3895      -10194.197757749867
3896      [0.28600726 0.32080401 0.05585168 0.06506872 0.
     00844402 0.42903809
3897 0.92230873]
3898      -10194.139239060944
3899
3900      [0.28600726 0.32080401 0.05585168 0.06506872 0.00844402
     0.42903809
3901 0.92230873]
3902 -10194.139239060944
3903 -2939.0140126074866
3904      [0.28600292 0.32083495 0.0563213 0.06561925 0.
     00845743 0.42903681
3905 0.92255593]
3906      -10194.12949613498
3907 The 100 -th iteration of the EM(G) algorithm
3908 [0.28600726 0.32080401 0.05585168 0.06506872 0.00844402 0
     .42903809
3909 0.92230873]
3910 -10181.426170845687
3911 -2938.9791432174834
3912
3913 M-step
3914 [0.28600726 0.32080401 0.05585168 0.06506872 0.00844402 0
     .42903809
3915 0.92230873]
3916 -10181.426170845687
```

```
3917 -2938.9791432174834
3918 [0.29140978 0.32692068 0.05011918 0.05949429 0.
      00877375 0.42907224
3919 0.92631961]
3920 -10189.385493398515
3921 [0.28870852 0.32386235 0.05298543 0.06228151 0.
      00860889 0.42905517
3922 0.92431417]
3923 -10183.239316218147
3924 [0.28735789 0.32233318 0.05441856 0.06367511 0.
      00852646 0.42904663
3925 0.92331145]
3926 -10181.788646749937
3927 [0.28668257 0.3215686 0.05513512 0.06437192 0.
      00848524 0.42904236
3928 0.92281009]
3929 -10181.471077535622
3930 [0.28634492 0.3211863 0.0554934 0.06472032 0.
      00846463 0.42904023
3931 0.92255941]
3932 -10181.414503079919
3933
3934 [0.28634492 0.3211863 0.0554934 0.06472032 0.00846463
      0.42904023
3935 0.92255941]
3936 -10181.414503079919
3937 -2938.9674754517155
3938 [0.28634339 0.32121971 0.05595514 0.06526378 0.
      00847877 0.42903746
3939 0.92280637]
3940 -10181.404693960189
3941 The 101 -th iteration of the EM(G) algorithm
3942 [0.28634492 0.3211863 0.0554934 0.06472032 0.00846463 0
      .42904023
3943 0.92255941]
3944 -10168.815231666315
3945 -2938.9335508029053
3946
3947 M-step
3948 [0.28634492 0.3211863 0.0554934 0.06472032 0.00846463 0
      .42904023
3949 0.92255941]
3950 -10168.815231666315
3951 -2938.9335508029053
3952 [0.29170009 0.32726874 0.04985563 0.05921657 0.
      00880409 0.42904967
3953 0.92656549]
3954 -10176.557230488124
3955 [0.2890225 0.32422752 0.05267451 0.06196844 0.
      00863436 0.42904495
```

```

3956 0.92456245]
3957          -10170.577282514229
3958          [0.28768371 0.32270691 0.05408396 0.06334438 0.
            0085495 0.42904259
3959 0.92356093]
3960          -10169.16665959009
3961          [0.28701431 0.32194661 0.05478868 0.06403235 0.
            00850706 0.42904141
3962 0.92306017]
3963          -10168.85825256019
3964          [0.28667961 0.32156646 0.05514104 0.06437634 0.
            00848585 0.42904082
3965 0.92280979]
3966          -10168.803532219128
3967
3968 [0.28667961 0.32156646 0.05514104 0.06437634 0.00848585
      0.42904082
3969 0.92280979]
3970 -10168.803532219128
3971 -2938.921851355719
3972          [0.2866808 0.32160224 0.05559516 0.06491294 0.
            0085005 0.42903676
3973 0.9230564 ]
3974          -10168.79366650495
3975 The 102 -th iteration of the EM(G) algorithm
3976 [0.28667961 0.32156646 0.05514104 0.06437634 0.00848585 0
      .42904082
3977 0.92280979]
3978 -10156.31576293984
3979 -2938.8888321673267
3980
3981 M-step
3982 [0.28667961 0.32156646 0.05514104 0.06437634 0.00848585 0
      .42904082
3983 0.92280979]
3984 -10156.31576293984
3985 -2938.8888321673267
3986          [0.29198864 0.32761539 0.04959553 0.05894164 0.
            00883172 0.42902865
3987 0.92680935]
3988          -10163.84886355803
3989          [0.28933413 0.32459092 0.05236829 0.06165899 0.
            00865878 0.42903473
3990 0.92480957]
3991          -10158.028732411496
3992          [0.28800687 0.32307869 0.05375466 0.06301766 0.
            00857232 0.42903778
3993 0.92380968]
3994          -10156.656593925534
3995          [0.28734324 0.32232257 0.05444785 0.063697 0.

```

```

3995 00852908 0.4290393
3996 0.92330974]
3997 -10156.35698397609
3998 [0.28701143 0.32194451 0.05479445 0.06403667 0.
    00850747 0.42904006
3999 0.92305977]
4000 -10156.304039797418
4001
4002 [0.28701143 0.32194451 0.05479445 0.06403667 0.00850747
    0.42904006
4003 0.92305977]
4004 -10156.304039797418
4005 -2938.8771090249056
4006 [0.28701523 0.32198261 0.05524116 0.06456657 0.
    00852248 0.4290349
4007 0.92330592]
4008 -10156.29412665277
4009 The 103 -th iteration of the EM(G) algorithm
4010 [0.28701143 0.32194451 0.05479445 0.06403667 0.00850747 0
    .42904006
4011 0.92305977]
4012 -10143.926031671683
4013 -2938.8449606274007
4014
4015 M-step
4016 [0.28701143 0.32194451 0.05479445 0.06403667 0.00850747 0
    .42904006
4017 0.92305977]
4018 -10143.926031671683
4019 -2938.8449606274007
4020 [0.29227543 0.32796062 0.04933887 0.05866952 0.
    00885725 0.42900932
4021 0.92705126]
4022 -10151.258130274739
4023 [0.28964343 0.32495257 0.05206666 0.0613531 0.
    00868236 0.42902469
4024 0.92505551]
4025 -10145.591805474962
4026 [0.28832743 0.32344854 0.05343055 0.06269488 0.
    00859491 0.42903237
4027 0.92405764]
4028 -10144.25668776482
4029 [0.28766943 0.32269653 0.0541125 0.06336578 0.
    00855119 0.42903622
4030 0.9235587 ]
4031 -10143.965533021888
4032 [0.28734043 0.32232052 0.05445347 0.06370122 0.
    00852933 0.42903814
4033 0.92330923]
4034 -10143.914292126326

```

```

4035
4036 [0.28734043 0.32232052 0.05445347 0.06370122 0.00852933
      0.42903814
4037 0.92330923]
4038 -10143.914292126326
4039 -2938.8332210820445
4040 [0.28734677 0.32236086 0.05489299 0.06422458 0.
      00854458 0.42903205
4041 0.92355485]
4042 -10143.904339919849
4043 The 104 -th iteration of the EM(G) algorithm
4044 [0.28734043 0.32232052 0.05445347 0.06370122 0.00852933 0
      .42903814
4045 0.92330923]
4046 -10131.644427268431
4047 -2938.8019109576326
4048
4049 M-step
4050 [0.28734043 0.32232052 0.05445347 0.06370122 0.00852933 0
      .42903814
4051 0.92330923]
4052 -10131.644427268431
4053 -2938.8019109576326
4054 [0.29256042 0.3283044 0.04908548 0.05840013 0.
      00888098 0.42899162
4055 0.92729132]
4056 -10138.783114107588
4057 [0.28995042 0.32531246 0.05176948 0.06105068 0.
      00870515 0.42901488
4058 0.92530028]
4059 -10133.264818321022
4060 [0.28864543 0.32381649 0.05311147 0.06237595 0.
      00861724 0.42902651
4061 0.92430475]
4062 -10131.965314386289
4063 [0.28799293 0.32306851 0.05378247 0.06303859 0.
      00857328 0.42903232
4064 0.92380699]
4065 -10131.682286135114
4066 [0.28766668 0.32269451 0.05411797 0.0633699 0.
      0085513 0.42903523
4067 0.92355811]
4068 -10131.632678404758
4069
4070 [0.28766668 0.32269451 0.05411797 0.0633699 0.0085513
      0.42903523
4071 0.92355811]
4072 -10131.632678404758
4073 -2938.790162093959
4074 [0.28767546 0.32273704 0.05455051 0.06388686 0.

```

```
4074 00856667 0.42902836
4075 0.92380312]
4076 -10131.622694893958
4077 The 105 -th iteration of the EM(G) algorithm
4078 [0.28766668 0.32269451 0.05411797 0.0633699 0.0085513 0
     .42903523
4079 0.92355811]
4080 -10119.469301782428
4081 -2938.7596589756913
4082
4083 M-step
4084 [0.28766668 0.32269451 0.05411797 0.0633699 0.0085513 0
     .42903523
4085 0.92355811]
4086 -10119.469301782428
4087 -2938.7596589756913
4088 [0.29284373 0.3286468 0.04883551 0.05813353 0.
     0089031 0.42897538
4089 0.92752952]
4090 -10126.421547559148
4091 [0.29025521 0.32567066 0.05147674 0.06075172 0.
     0087272 0.4290053
4092 0.92554382]
4093 -10121.045972395816
4094 [0.28896094 0.32418258 0.05279736 0.06206081 0.
     00863925 0.42902027
4095 0.92455097]
4096 -10119.78079087336
4097 [0.28831381 0.32343855 0.05345767 0.06271536 0.
     00859528 0.42902775
4098 0.92405454]
4099 -10119.505588034315
4100 [0.28799024 0.32306653 0.05378782 0.06304263 0.
     00857329 0.42903149
4101 0.92380633]
4102 -10119.457549564602
4103
4104 [0.28799024 0.32306653 0.05378782 0.06304263 0.00857329
     0.42903149
4105 0.92380633]
4106 -10119.457549564602
4107 -2938.747906757865
4108 [0.2880014 0.32311119 0.05421354 0.06355333 0.
     00858868 0.42902397
4109 0.92405064]
4110 -10119.44754184015
4111
4112 [0.2880014 0.32311119 0.05421354 0.06355333 0.00858868
     0.42902397
4113 0.92405064]
```

```
4114 -10119.44754184015
4115 -2938.7378990334137
4116 [0.28827079 0.32346598 0.05392333 0.06314707 0.
     0085592 0.42898971
4117 0.92428076]
4118 -10119.43911527639
4119 The 106 -th iteration of the EM(G) algorithm
4120 [0.2880014 0.32311119 0.05421354 0.06355333 0.00858868 0
     .42902397
4121 0.92405064]
4122 -10119.35821125846
4123 -2938.736470473982
4124
4125 M-step
4126 [0.2880014 0.32311119 0.05421354 0.06355333 0.00858868 0
     .42902397
4127 0.92405064]
4128 -10119.35821125846
4129 -2938.736470473982
4130 [0.29319952 0.32909028 0.04885608 0.05821885 0.
     00812488 0.42847801
4131 0.92773765]
4132 -10126.529932982052
4133 [0.29060046 0.32610074 0.05153481 0.06088609 0.
     00835678 0.42875099
4134 0.92589415]
4135 -10120.98937477886
4136 [0.28930093 0.32460596 0.05287418 0.06221971 0.
     00847273 0.42888748
4137 0.9249724 ]
4138 -10119.683007331865
4139 [0.28865117 0.32385858 0.05354386 0.06288652 0.
     00853071 0.42895573
4140 0.92451152]
4141 -10119.397650254385
4142 [0.28832629 0.32348488 0.0538787 0.06321993 0.
     0085597 0.42898985
4143 0.92428108]
4144 -10119.347158250113
4145
4146 [0.28832629 0.32348488 0.0538787 0.06321993 0.0085597
     0.42898985
4147 0.92428108]
4148 -10119.347158250113
4149 -2938.7254174656346
4150 [0.28833489 0.32352605 0.05431074 0.06373984 0.
     00856079 0.4289834
4151 0.92451323]
4152 -10119.337634132584
4153 The 107 -th iteration of the EM(G) algorithm
```

```
4154 [0.28832629 0.32348488 0.0538787 0.06321993 0.0085597 0  
.42898985  
4155 0.92428108]  
4156 -10107.147158879596  
4157 -2938.694933989831  
4158  
4159 M-step  
4160 [0.28832629 0.32348488 0.0538787 0.06321993 0.0085597 0  
.42898985  
4161 0.92428108]  
4162 -10107.147158879596  
4163 -2938.694933989831  
4164 [0.2934703 0.32942084 0.04864218 0.05798829 0.  
00868169 0.42893615  
4165 0.92804618]  
4166 -10114.032454619797  
4167 [0.2908983 0.32645286 0.05126044 0.06060411 0.  
00862069 0.428963  
4168 0.92616363]  
4169 -10108.71052565981  
4170 [0.28961229 0.32496887 0.05256957 0.06191202 0.  
0085902 0.42897642  
4171 0.92522236]  
4172 -10107.457051462396  
4173 [0.28896929 0.32422688 0.05322413 0.06256597 0.  
00857495 0.42898314  
4174 0.92475172]  
4175 -10107.183912300985  
4176 [0.28864779 0.32385588 0.05355142 0.06289295 0.  
00856732 0.42898649  
4177 0.9245164 ]  
4178 -10107.135956798575  
4179  
4180 [0.28864779 0.32385588 0.05355142 0.06289295 0.00856732  
0.42898649  
4181 0.9245164 ]  
4182 -10107.135956798575  
4183 -2938.68373190881  
4184 [0.28866002 0.32390058 0.05397337 0.06340265 0.  
00857597 0.42898458  
4185 0.92474923]  
4186 -10107.126386845803  
4187 The 108 -th iteration of the EM(G) algorithm  
4188 [0.28864779 0.32385588 0.05355142 0.06289295 0.00856732 0  
.42898649  
4189 0.9245164 ]  
4190 -10095.103887187808  
4191 -2938.6543249781  
4192  
4193 M-step
```

```

4194 [0.28864779 0.32385588 0.05355142 0.06289295 0.00856732 0
     .42898649
4195 0.9245164 ]
4196 -10095.103887187808
4197 -2938.6543249781
4198      [0.29374764 0.32975814 0.04840535 0.0577332 0.
     00880837 0.42900431
4199 0.92829147]
4200      -10101.79386746468
4201      [0.29119772 0.32680701 0.05097838 0.06031308 0.
     00868785 0.4289954
4202 0.92640393]
4203      -10096.621192670274
4204      [0.28992275 0.32533145 0.0522649 0.06160301 0.
     00862758 0.42899095
4205 0.92546017]
4206      -10095.403744464122
4207      [0.28928527 0.32459366 0.05290816 0.06224798 0.
     00859745 0.42898872
4208 0.92498828]
4209      -10095.138883765483
4210      [0.28896653 0.32422477 0.05322979 0.06257047 0.
     00858239 0.42898761
4211 0.92475234]
4212      -10095.092623380442
4213
4214      [0.28896653 0.32422477 0.05322979 0.06257047 0.00858239
     0.42898761
4215 0.92475234]
4216 -10095.092623380442
4217 -2938.6430611707337
4218      [0.28898128 0.32427184 0.0536445 0.06307322 0.
     00859296 0.42898545
4219 0.92498496]
4220      -10095.083020383106
4221 The 109 -th iteration of the EM(G) algorithm
4222 [0.28896653 0.32422477 0.05322979 0.06257047 0.00858239 0
     .42898761
4223 0.92475234]
4224 -10083.17846405786
4225 -2938.6144623552964
4226
4227 M-step
4228 [0.28896653 0.32422477 0.05322979 0.06257047 0.00858239 0
     .42898761
4229 0.92475234]
4230 -10083.17846405786
4231 -2938.6144623552964
4232      [0.29402489 0.33009562 0.04816677 0.05747567 0.
     00885241 0.42900076

```

```

4233 0.92852333]
4234      -10089.691755207159
4235      [0.29149571 0.3271602  0.05069828 0.06002307 0.
4236      0087174  0.42899418
4237 0.92663784]
4238      -10084.654278532747
4239      [0.29023112 0.32569248 0.05196403 0.06129677 0.
4240      00864989  0.42899089
4241 0.92569509]
4242      -10083.469370938528
4243      [0.28959882 0.32495863 0.05259691 0.06193362 0.
4244      00861614  0.42898925
4245 0.92522372]
4246      -10083.211944386954
4247      [0.28928268 0.3245917  0.05291335 0.06225204 0.
4248      00859926  0.42898843
4249 0.92498803]
4250 -10083.167183132484
4251 -2938.6031814299195
4252      [0.28929969 0.32464086 0.0533215  0.06274856 0.
4253      00861058  0.4289853
4254 0.92522021]
4255      -10083.157555920048
4256 The 110 -th iteration of the EM(G) algorithm
4257 [0.28928268 0.3245917  0.05291335 0.06225204 0.00859926 0
4258      0.42898843
4259 0.92498803]
4260 -10071.36017890731
4261 -2938.5753190051173
4262 M-step
4263 [0.28928268 0.3245917  0.05291335 0.06225204 0.00859926 0
4264      0.42898843
4265 0.92498803]
4266 -10071.36017890731
4267 -2938.5753190051173
4268      [0.29430085 0.33043203 0.04793036 0.05721979 0.
4269      00887956  0.42898526
4270 0.92875121]
4271      -10077.705261522151
4272      [0.29179176 0.32751187 0.05042186 0.05973592 0.
4273      00873941  0.42898684
4274 0.92686962]
4275      -10072.796552931577
4276      [0.29053722 0.32605178 0.0516676  0.06099398 0.
4277

```

```
4272 00866934 0.42898763
4273 0.92592882]
4274 -10071.642607379228
4275 [0.28990995 0.32532174 0.05229048 0.06162301 0.
0086343 0.42898803
4276 0.92545843]
4277 -10071.392239929679
4278 [0.28959631 0.32495672 0.05260191 0.06193753 0.
00861678 0.42898823
4279 0.92522323]
4280 -10071.348894480889
4281
4282 [0.28959631 0.32495672 0.05260191 0.06193753 0.00861678
0.42898823
4283 0.92522323]
4284 -10071.348894480889
4285 -2938.564034578697
4286 [0.28961548 0.32500788 0.05300378 0.06242806 0.
00862852 0.42898414
4287 0.92545486]
4288 -10071.339249718725
4289 The 111 -th iteration of the EM(G) algorithm
4290 [0.28959631 0.32495672 0.05260191 0.06193753 0.00861678 0
.42898823
4291 0.92522323]
4292 -10059.645700627389
4293 -2938.5368740341055
4294
4295 M-step
4296 [0.28959631 0.32495672 0.05260191 0.06193753 0.00861678 0
.42898823
4297 0.92522323]
4298 -10059.645700627389
4299 -2938.5368740341055
4300 [0.29457519 0.33076714 0.04769676 0.05696622 0.
00890219 0.42896881
4301 0.9289769 ]
4302 -10065.829120634686
4303 [0.29208575 0.32786193 0.05014934 0.05945187 0.
00875949 0.42897852
4304 0.92710006]
4305 -10061.044201868805
4306 [0.29084103 0.32640933 0.05137563 0.0606947 0.
00868813 0.42898337
4307 0.92616165]
4308 -10059.920004020536
4309 [0.29021867 0.32568302 0.05198877 0.06131611 0.
00865246 0.4289858
4310 0.92569244]
4311 -10059.676410861837
```

```
4312 [0.28990749 0.32531987 0.05229534 0.06162682 0.  
     00863462 0.42898702  
4313 0.92545783]  
4314 -10059.634419858028  
4315  
4316 [0.28990749 0.32531987 0.05229534 0.06162682 0.00863462  
     0.42898702  
4317 0.92545783]  
4318 -10059.634419858028  
4319 -2938.525593264745  
4320 [0.28992873 0.32537297 0.05269111 0.06211152 0.  
     00864662 0.42898208  
4321 0.92568884]  
4322 -10059.62476343624  
4323 The 112 -th iteration of the EM(G) algorithm  
4324 [0.28990749 0.32531987 0.05229534 0.06162682 0.00863462 0  
     .42898702  
4325 0.92545783]  
4326 -10048.033057654458  
4327 -2938.4991077086142  
4328  
4329 M-step  
4330 [0.28990749 0.32531987 0.05229534 0.06162682 0.00863462 0  
     .42898702  
4331 0.92545783]  
4332 -10048.033057654458  
4333 -2938.4991077086142  
4334 [0.294848 0.33110093 0.04746613 0.05671517 0.  
     00892281 0.42895334  
4335 0.92920079]  
4336 -10054.060635962684  
4337 [0.29237774 0.3282104 0.04988074 0.059171 0.  
     00877871 0.42897018  
4338 0.92732931]  
4339 -10049.39507469876  
4340 [0.29114262 0.32676514 0.05108804 0.06039891 0.  
     00870667 0.4289786  
4341 0.92639357]  
4342 -10048.299546242844  
4343 [0.29052505 0.3260425 0.05169169 0.06101286 0.  
     00867064 0.42898281  
4344 0.9259257 ]  
4345 -10048.062475791352  
4346 [0.29021627 0.32568119 0.05199352 0.06131984 0.  
     00865263 0.42898491  
4347 0.92569177]  
4348 -10048.021785720415  
4349  
4350 [0.29021627 0.32568119 0.05199352 0.06131984 0.00865263  
     0.42898491
```

```
4351 0.92569177]
4352 -10048.021785720415
4353 -2938.487835774571
4354 [0.29023953 0.32573618 0.05238335 0.06179885 0.
    0086648 0.42897926
4355 0.92592208]
4356 -10048.012123121976
4357 The 113 -th iteration of the EM(G) algorithm
4358 [0.29021627 0.32568119 0.05199352 0.06131984 0.00865263 0
    .42898491
4359 0.92569177]
4360 -10036.520686094953
4361 -2938.4620012269606
4362
4363 M-step
4364 [0.29021627 0.32568119 0.05199352 0.06131984 0.00865263 0
    .42898491
4365 0.92569177]
4366 -10036.520686094953
4367 -2938.4620012269606
4368 [0.29511927 0.33143341 0.04723849 0.05646672 0.
    00894189 0.42893906
4369 0.92942295]
4370 -10042.397802125226
4371 [0.29266777 0.3285573 0.049616 0.05889328 0.
    00879726 0.42896198
4372 0.92755736]
4373 -10037.847500379348
4374 [0.29144202 0.32711924 0.05080476 0.06010656 0.
    00872495 0.42897345
4375 0.92662456]
4376 -10036.779645306002
4377 [0.29082915 0.32640022 0.05139914 0.0607132 0.
    00868879 0.42897918
4378 0.92615817]
4379 -10036.548865623745
4380 [0.29052271 0.3260407 0.05169633 0.06101652 0.
    00867071 0.42898204
4381 0.92592497]
4382 -10036.509427384945
4383
4384 [0.29052271 0.3260407 0.05169633 0.06101652 0.00867071
    0.42898204
4385 0.92592497]
4386 -10036.509427384945
4387 -2938.4507425169522
4388 [0.29054791 0.32609753 0.05208038 0.06148994 0.
    00868295 0.4289758
4389 0.92615453]
4390 -10036.499763877697
```

```
4391 The 114 -th iteration of the EM(G) algorithm
4392 [0.29052271 0.3260407 0.05169633 0.06101652 0.00867071 0
     .42898204
4393 0.92592497]
4394 -10025.107213695457
4395 -2938.425536788178
4396
4397 M-step
4398 [0.29052271 0.3260407 0.05169633 0.06101652 0.00867071 0
     .42898204
4399 0.92592497]
4400 -10025.107213695457
4401 -2938.425536788178
4402      [0.29538894 0.3317646 0.04701374 0.05622068 0.
     00895968 0.42892589
4403 0.92964342]
4404      -10030.839140045364
4405      [0.29295582 0.32890265 0.04935503 0.0586186 0.
     0088152 0.42895397
4406 0.92778419]
4407      -10026.400082210479
4408      [0.29173927 0.32747168 0.05052568 0.05981756 0.
     00874295 0.42896801
4409 0.92685458]
4410      -10025.358924032818
4411      [0.29113099 0.32675619 0.051111 0.06041704 0.
     00870683 0.42897503
4412 0.92638977]
4413      -10025.134207476358
4414      [0.29082685 0.32639845 0.05140366 0.06071678 0.
     00868877 0.42897854
4415 0.92615737]
4416      -10025.095972742438
4417
4418      [0.29082685 0.32639845 0.05140366 0.06071678 0.00868877
     0.42897854
4419 0.92615737]
4420 -10025.095972742438
4421 -2938.4142958351586
4422      [0.29085394 0.32645706 0.05178209 0.06118475 0.
     00870102 0.42897179
4423 0.92638613]
4424      -10025.086312904677
4425 The 115 -th iteration of the EM(G) algorithm
4426 [0.29082685 0.32639845 0.05140366 0.06071678 0.00868877 0
     .42897854
4427 0.92615737]
4428 -10013.79117361853
4429 -2938.389697181722
4430
```

```

4431 M-step
4432 [0.29082685 0.32639845 0.05140366 0.06071678 0.00868877 0
     .42897854
4433 0.92615737]
4434 -10013.79117361853
4435 -2938.389697181722
4436      [0.29565711 0.33209445 0.04679185 0.05597711 0.
     00897634 0.42891376
4437 0.92986226]
4438      -10019.382860327363
4439      [0.29324198 0.32924645 0.04909776 0.05834694 0.
     00883255 0.42894615
4440 0.92800981]
4441      -10015.051274996513
4442      [0.29203442 0.32782245 0.05025071 0.05953186 0.
     00876066 0.42896234
4443 0.92708359]
4444      -10014.035897389731
4445      [0.29143063 0.32711045 0.05082719 0.06012432 0.
     00872472 0.42897044
4446 0.92662048]
4447      -10013.817030690361
4448      [0.29112874 0.32675445 0.05111543 0.06042055 0.
     00870674 0.42897449
4449 0.92638893]
4450      -10013.779954368063
4451
4452      [0.29112874 0.32675445 0.05111543 0.06042055 0.00870674
     0.42897449
4453 0.92638893]
4454 -10013.779954368063
4455 -2938.3784779312546
4456      [0.29115766 0.3268148 0.05148836 0.06088317 0.
     00871893 0.42896734
4457 0.92661683]
4458      -10013.77030265816
4459 The 116 -th iteration of the EM(G) algorithm
4460 [0.29112874 0.32675445 0.05111543 0.06042055 0.00870674 0
     .42897449
4461 0.92638893]
4462 -10002.57120460303
4463 -2938.3544659199333
4464
4465 M-step
4466 [0.29112874 0.32675445 0.05111543 0.06042055 0.00870674 0
     .42897449
4467 0.92638893]
4468 -10002.57120460303
4469 -2938.3544659199333
4470      [0.29592375 0.33242306 0.04657284 0.05573601 0.

```

```
4470 0089919 0.42890253
4471 0.93007946]
4472 -10008.027299734087
4473 [0.29352624 0.32958875 0.04884413 0.05807828 0.
00884932 0.42893851
4474 0.92823419]
4475 -10003.799644484232
4476 [0.29232749 0.3281716 0.04997978 0.05924942 0.
00877803 0.4289565
4477 0.92731156]
4478 -10002.809187335082
4479 [0.29172812 0.32746302 0.0505476 0.05983498 0.
00874239 0.42896549
4480 0.92685024]
4481 -10002.595970570586
4482 [0.29142843 0.32710873 0.05083151 0.06012777 0.
00872457 0.42896999
4483 0.92661958]
4484 -10002.560010526118
4485
4486 [0.29142843 0.32710873 0.05083151 0.06012777 0.00872457
0.42896999
4487 0.92661958]
4488 -10002.560010526118
4489 -2938.343271843022
4490 [0.29145912 0.32717079 0.0511991 0.06058515 0.
00873664 0.42896251
4491 0.92684659]
4492 -10002.550370908222
4493 The 117 -th iteration of the EM(G) algorithm
4494 [0.29142843 0.32710873 0.05083151 0.06012777 0.00872457 0
.42896999
4495 0.92661958]
4496 -9991.446058989879
4497 -2938.3198272704913
4498
4499 M-step
4500 [0.29142843 0.32710873 0.05083151 0.06012777 0.00872457 0
.42896999
4501 0.92661958]
4502 -9991.446058989879
4503 -2938.3198272704913
4504 [0.29618894 0.33275039 0.04635665 0.05549735 0.
00900654 0.42889215
4505 0.93029508]
4506 -9996.771010506385
4507 [0.29380868 0.32992956 0.04859408 0.05781256 0.
00886555 0.42893107
4508 0.92845733]
4509 -9992.643894717352
```

```
4510      [0.29261856 0.32851915 0.0497128 0.05897016 0.  
        00879506 0.42895053  
4511 0.92753846]  
4512      -9991.677535152667  
4513      [0.29202349 0.32781394 0.05027216 0.05954897 0.  
        00875981 0.42896026  
4514 0.92707902]  
4515      -9991.46977722144  
4516      [0.29172596 0.32746134 0.05055184 0.05983837 0.  
        00874219 0.42896512  
4517 0.9268493 ]  
4518      -9991.434893264252  
4519  
4520      [0.29172596 0.32746134 0.05055184 0.05983837 0.00874219  
        0.42896512  
4521 0.9268493 ]  
4522 -9991.434893264252  
4523 -2938.3086615448638  
4524      [0.29175838 0.32752505 0.0509142 0.06029061 0.  
        0087541 0.42895739  
4525 0.92707536]  
4526      -9991.425269409578  
4527 The 118 -th iteration of the EM(G) algorithm  
4528 [0.29172596 0.32746134 0.05055184 0.05983837 0.00874219 0  
.42896512  
4529 0.9268493 ]  
4530 -9980.414511148545  
4531 -2938.285766025151  
4532  
4533 M-step  
4534 [0.29172596 0.32746134 0.05055184 0.05983837 0.00874219 0  
.42896512  
4535 0.9268493 ]  
4536 -9980.414511148545  
4537 -2938.285766025151  
4538      [0.29645266 0.33307642 0.04614322 0.05526107 0.  
        00902023 0.42888244  
4539 0.93050907]  
4540      -9985.612596246645  
4541      [0.29408931 0.33026888 0.04834753 0.05754972 0.  
        00888121 0.42892378  
4542 0.92867919]  
4543      -9981.582759880199  
4544      [0.29290764 0.32886511 0.04944968 0.05869404 0.  
        0088117 0.42894445  
4545 0.92776424]  
4546      -9980.639706509623  
4547      [0.2923168 0.32816322 0.05000076 0.05926621 0.  
        00877694 0.42895479  
4548 0.92730677]
```

```
4549      -9980.437223519708
4550      [0.29202138 0.32781228 0.0502763 0.05955229 0.
        00875957 0.42895996
4551 0.92707804]
4552      -9980.403376921971
4553
4554 [0.29202138 0.32781228 0.0502763 0.05955229 0.00875957
        0.42895996
4555 0.92707804]
4556 -9980.403376921971
4557 -2938.2746317985775
4558      [0.29205547 0.32787761 0.05063357 0.0599995 0.
        00877128 0.42895202
4559 0.92730312]
4560      -9980.393772286876
4561 The 119 -th iteration of the EM(G) algorithm
4562 [0.29202138 0.32781228 0.0502763 0.05955229 0.00875957 0
        .42895996
4563 0.92707804]
4564 -9969.475341109144
4565 -2938.2522676534663
4566
4567 M-step
4568 [0.29202138 0.32781228 0.0502763 0.05955229 0.00875957 0
        .42895996
4569 0.92707804]
4570 -9969.475341109144
4571 -2938.2522676534663
4572      [0.29671491 0.33340122 0.04593249 0.05502717 0.
        00903316 0.42887345
4573 0.93072153]
4574      -9974.55064934495
4575      [0.29436814 0.33060675 0.04810439 0.05728973 0.
        00889636 0.42891671
4576 0.92889978]
4577      -9970.614974145425
4578      [0.29319476 0.32920951 0.04919034 0.05842101 0.
        00882796 0.42893833
4579 0.92798891]
4580      -9969.694470652921
4581      [0.29260807 0.3285109 0.04973332 0.05898665 0.
        00879377 0.42894914
4582 0.92753347]
4583      -9969.497087159947
4584      [0.29231472 0.32816159 0.05000481 0.05926947 0.
        00877667 0.42895455
4585 0.92730576]
4586      -9969.464241128004
4587
4588 [0.29231472 0.32816159 0.05000481 0.05926947 0.00877667
```

```
4588 0.42895455
4589 0.92730576]
4590 -9969.464241128004
4591 -2938.241167672326
4592 [0.29235045 0.32822849 0.05035711 0.05971174 0.
00878815 0.42894647
4593 0.92752982]
4594 -9969.454658794744
4595 The 120 -th iteration of the EM(G) algorithm
4596 [0.29231472 0.32816159 0.05000481 0.05926947 0.00877667 0
.42895455
4597 0.92730576]
4598 -9958.627357389048
4599 -2938.2193179838423
4600
4601 M-step
4602 [0.29231472 0.32816159 0.05000481 0.05926947 0.00877667 0
.42895455
4603 0.92730576]
4604 -9958.627357389048
4605 -2938.2193179838423
4606 [0.29697569 0.33372474 0.04572445 0.05479562 0.
00904531 0.42886504
4607 0.93093241]
4608 -9963.583749271716
4609 [0.29464521 0.33094316 0.04786463 0.05703254 0.
00891099 0.4289098
4610 0.92911908]
4611 -9959.739291511069
4612 [0.29347997 0.32955238 0.04893472 0.05815101 0.
00884383 0.42893217
4613 0.92821242]
4614 -9958.840623970236
4615 [0.29289735 0.32885698 0.04946976 0.05871024 0.
00881025 0.42894336
4616 0.92775909]
4617 -9958.648174392849
4618 [0.29260604 0.32850929 0.04973729 0.05898985 0.
00879346 0.42894896
4619 0.92753242]
4620 -9958.61629421777
4621
4622 [0.29260604 0.32850929 0.04973729 0.05898985 0.00879346
0.42894896
4623 0.92753242]
4624 -9958.61629421777
4625 -2938.2082548125645
4626 [0.29264334 0.32857773 0.05008473 0.05942728 0.
00880469 0.42894077
4627 0.92775544]
```

```
4628      -9958.606737166538
4629 The 121 -th iteration of the EM(G) algorithm
4630 [0.29260604 0.32850929 0.04973729 0.05898985 0.00879346 0
     .42894896
4631 0.92753242]
4632 -9947.869452803645
4633 -2938.186903606228
4634
4635 M-step
4636 [0.29260604 0.32850929 0.04973729 0.05898985 0.00879346 0
     .42894896
4637 0.92753242]
4638 -9947.869452803645
4639 -2938.186903606228
4640      [0.2972351 0.33404706 0.04551908 0.05456639 0.
     00905678 0.42885716
4641 0.93114175]
4642      -9952.710665680841
4643      [0.29492057 0.33127817 0.04762819 0.05677812 0.
     00892512 0.42890306
4644 0.92933709]
4645      -9948.95457439189
4646      [0.2937633 0.32989373 0.04868274 0.05788398 0.
     00885929 0.42892601
4647 0.92843475]
4648      -9948.077052005816
4649      [0.29318467 0.32920151 0.04921001 0.05843692 0.
     00882637 0.42893748
4650 0.92798359]
4651      -9947.889376397245
4652      [0.29289535 0.3288554 0.04947365 0.05871338 0.
     00880991 0.42894322
4653 0.927758 ]
4654      -9947.858428690477
4655
4656      [0.29289535 0.3288554 0.04947365 0.05871338 0.00880991
     0.42894322
4657 0.927758 ]
4658 -9947.858428690477
4659 -2938.17587949306
4660      [0.29293419 0.32892534 0.04981636 0.05914607 0.
     00882087 0.42893497
4661 0.92797995]
4662      -9947.848899423407
4663 The 122 -th iteration of the EM(G) algorithm
4664 [0.29289535 0.3288554 0.04947365 0.05871338 0.00880991 0
     .42894322
4665 0.927758 ]
4666 -9937.200508562575
4667 -2938.1550112936475
```

```
4668
4669 M-step
4670 [0.29289535 0.3288554 0.04947365 0.05871338 0.00880991 0
      .42894322
4671 0.927758 ]
4672 -9937.200508562575
4673 -2938.1550112936475
4674 [0.2974931 0.33436817 0.04531635 0.0543395 0.
      00906764 0.42884978
4675 0.93134959]
4676 -9941.930044555838
4677 [0.29519422 0.33161178 0.047395 0.05652644 0.
      00893878 0.4288965
4678 0.9295538 ]
4679 -9938.259647443303
4680 [0.29404479 0.33023359 0.04843432 0.05761991 0.
      00887435 0.42891986
4681 0.9286559 ]
4682 -9937.402623085552
4683 [0.29347007 0.32954449 0.04895399 0.05816665 0.
      00884213 0.42893154
4684 0.92820695]
4685 -9937.219571805867
4686 [0.29318271 0.32919994 0.04921382 0.05844002 0.
      00882602 0.42893738
4687 0.92798248]
4688 -9937.189525435067
4689
4690 [0.29318271 0.32919994 0.04921382 0.05844002 0.00882602
      0.42893738
4691 0.92798248]
4692 -9937.189525435067
4693 -2938.14402816614
4694 [0.29322304 0.32927136 0.04955189 0.05886803 0.
      00883669 0.42892909
4695 0.92820333]
4696 -9937.180026518283
4697 The 123 -th iteration of the EM(G) algorithm
4698 [0.29318271 0.32919994 0.04921382 0.05844002 0.00882602 0
      .42893738
4699 0.92798248]
4700 -9926.619510553144
4701 -2938.123628459345
4702
4703 M-step
4704 [0.29318271 0.32919994 0.04921382 0.05844002 0.00882602 0
      .42893738
4705 0.92798248]
4706 -9926.619510553144
4707 -2938.123628459345
```

```

4708      [0.29774972 0.33468803 0.04511616 0.05411481 0.
        00907787 0.4288428
4709  0.93155591]
4710      -9931.240861083248
4711      [0.29546622 0.33194399 0.04716499 0.05627741 0.
        00895194 0.42889009
4712  0.92976919]
4713      -9927.65349497894
4714      [0.29432446 0.33057197 0.0481894 0.05735871 0.
        00888898 0.42891373
4715  0.92887584]
4716      -9926.816323264835
4717      [0.29375359 0.32988596 0.04870161 0.05789937 0.
        0088575 0.42892556
4718  0.92842916]
4719      -9926.637746829485
4720      [0.29346815 0.32954295 0.04895771 0.05816969 0.
        00884176 0.42893147
4721  0.92820582]
4722      -9926.608570561088
4723
4724      [0.29346815 0.32954295 0.04895771 0.05816969 0.00884176
        0.42893147
4725  0.92820582]
4726 -9926.608570561088
4727 -2938.1126884672885
4728      [0.29350993 0.32961579 0.04929127 0.05859313 0.
        00885213 0.42892318
4729  0.92842554]
4730      -9926.599104198667
4731 The 124 -th iteration of the EM(G) algorithm
4732 [0.29346815 0.32954295 0.04895771 0.05816969 0.00884176 0
        .42893147
4733  0.92820582]
4734 -9916.12532720855
4735 -2938.092742796007
4736
4737 M-step
4738 [0.29346815 0.32954295 0.04895771 0.05816969 0.00884176 0
        .42893147
4739  0.92820582]
4740 -9916.12532720855
4741 -2938.092742796007
4742      [0.29800495 0.3350067 0.0449185 0.05389239 0.
        00908756 0.42883624
4743  0.93176071]
4744      -9920.641738854643
4745      [0.29573655 0.33227482 0.04693811 0.05603104 0.
        00896466 0.42888385
4746  0.92998327]

```

```
4747      -9917.13492610332
4748      [0.29460235 0.33090889 0.04794791 0.05710036 0.
        00890321 0.42890766
4749  0.92909454]
4750      -9916.317007242433
4751      [0.29403525 0.33022592 0.04845281 0.05763503 0.
        00887249 0.42891956
4752  0.92865018]
4753      -9916.142767036166
4754      [0.2937517 0.32988443 0.04870526 0.05790236 0.
        00885712 0.42892552
4755  0.928428 ]
4756      -9916.11443207196
4757
4758  [0.2937517 0.32988443 0.04870526 0.05790236 0.00885712
        0.42892552
4759  0.928428 ]
4760 -9916.11443207196
4761 -2938.081847659416
4762      [0.29379489 0.32995868 0.04903439 0.0583213 0.
        00886718 0.42891725
4763  0.92864658]
4764      -9916.105000211424
4765 The 125 -th iteration of the EM(G) algorithm
4766 [0.2937517 0.32988443 0.04870526 0.05790236 0.00885712 0
        .42892552
4767  0.928428 ]
4768 -9905.716960321646
4769 -2938.0623425651092
4770
4771 M-step
4772 [0.2937517 0.32988443 0.04870526 0.05790236 0.00885712 0
        .42892552
4773  0.928428 ]
4774 -9905.716960321646
4775 -2938.0623425651092
4776      [0.2982589 0.33532426 0.04472336 0.05367221 0.
        00909678 0.42883006
4777  0.93196405]
4778      -9910.131585618474
4779      [0.2960053 0.33260435 0.04671431 0.05578728 0.
        00897695 0.42887779
4780  0.93019602]
4781      -9906.702919102008
4782      [0.2948785 0.33124439 0.04770979 0.05684482 0.
        00891704 0.42890165
4783  0.92931201]
4784      -9905.903671053893
4785      [0.2943151 0.33056441 0.04820753 0.05737359 0.
        00888708 0.42891358
```

```
4786 0.92887001]
4787          -9905.733632854159
4788          [0.2940334  0.33022442 0.04845639 0.05763798 0.
4789 0088721  0.42891955
4789 0.928649 ]
4790          -9905.706111458425
4791
4792  [0.2940334  0.33022442 0.04845639 0.05763798 0.0088721
4793 0.42891955
4793 0.928649 ]
4794 -9905.706111458425
4795 -2938.051493701888
4796          [0.29407796 0.33030004 0.04878121 0.05805251 0.
4797 00888183  0.42891132
4797 0.92886642]
4798          -9905.696716027476
4799 The 126 -th iteration of the EM(G) algorithm
4800 [0.2940334  0.33022442 0.04845639 0.05763798 0.0088721 0
4801 0.42891955
4801 0.928649 ]
4802 -9895.393396193427
4803 -2938.0324161029175
4804
4805 M-step
4806 [0.2940334  0.33022442 0.04845639 0.05763798 0.0088721 0
4807 0.42891955
4807 0.928649 ]
4808 -9895.393396193427
4809 -2938.0324161029175
4810          [0.29851148 0.33564058 0.04453071 0.05345422 0.
4811 00910546  0.42882417
4811 0.93216587]
4812          -9899.709207644592
4813          [0.29627244 0.3329325  0.04649355 0.0555461 0.
4814 00898878  0.42887186
4814 0.93040744]
4815          -9896.356418545434
4816          [0.29515292 0.33157846 0.04747497 0.05659204 0.
4817 00893044  0.4288957
4817 0.92952822]
4818          -9895.575292242705
4819          [0.29459316 0.33090144 0.04796568 0.05711501 0.
4820 00890127  0.42890763
4820 0.92908861]
4821          -9895.409329236798
4822          [0.29431328 0.33056293 0.04821104 0.05737649 0.
4823 00888669  0.42891359
4823 0.92886881]
4824          -9895.382595106501
4825
```

```
4826 [0.29431328 0.33056293 0.04821104 0.05737649 0.00888669  
     0.42891359  
4827 0.92886881]  
4828 -9895.382595106501  
4829 -2938.0216150159913  
4830      [0.29435918 0.33063988 0.04853162 0.05778669 0.  
     0088961 0.42890542  
4831 0.92908504]  
4832      -9895.373237784734  
4833 The 127 -th iteration of the EM(G) algorithm  
4834 [0.29431328 0.33056293 0.04821104 0.05737649 0.00888669 0  
     .42891359  
4835 0.92886881]  
4836 -9885.153704005512  
4837 -2938.002952584393  
4838  
4839 M-step  
4840 [0.29431328 0.33056293 0.04821104 0.05737649 0.00888669 0  
     .42891359  
4841 0.92886881]  
4842 -9885.153704005512  
4843 -2938.002952584393  
4844      [0.29876272 0.33595569 0.04434045 0.05323837 0.  
     00911375 0.42881861  
4845 0.93236624]  
4846      -9889.373617349978  
4847      [0.296538 0.33325931 0.04627574 0.05530743 0.  
     00900022 0.4288661  
4848 0.93061752]  
4849      -9886.094479811118  
4850      [0.29542564 0.33191112 0.04724339 0.05634196 0.  
     00894345 0.42888984  
4851 0.92974316]  
4852      -9885.33093679334  
4853      [0.29486946 0.33123703 0.04772722 0.05685923 0.  
     00891507 0.42890172  
4854 0.92930599]  
4855      -9885.16892470116  
4856      [0.29459137 0.33089998 0.04796913 0.05711786 0.  
     00890088 0.42890765  
4857 0.9290874 ]  
4858      -9885.142952099279  
4859  
4860      [0.29459137 0.33089998 0.04796913 0.05711786 0.00890088  
     0.42890765  
4861 0.9290874 ]  
4862 -9885.142952099279  
4863 -2937.99220067816  
4864      [0.29463857 0.33097824 0.04828558 0.05752379 0.  
     00890996 0.42889956
```

```
4865 0.92930243]
4866      -9885.133634471395
4867 The 128 -th iteration of the EM(G) algorithm
4868 [0.29459137 0.33089998 0.04796913 0.05711786 0.00890088 0
     .42890765
4869 0.9290874 ]
4870 -9874.996900792661
4871 -2937.973941318336
4872
4873 M-step
4874 [0.29459137 0.33089998 0.04796913 0.05711786 0.00890088 0
     .42890765
4875 0.9290874 ]
4876 -9874.996900792661
4877 -2937.973941318336
4878      [0.29901271 0.33626971 0.04415261 0.05302467 0.
     00912161 0.4288133
4879 0.93256514]
4880      -9879.123714801055
4881      [0.29680204 0.33358485 0.04606087 0.05507126 0.
     00901125 0.42886048
4882 0.93082627]
4883      -9875.916091016172
4884      [0.2956967 0.33224241 0.047015 0.05609456 0.
     00895606 0.42888406
4885 0.92995683]
4886      -9875.169614792681
4887      [0.29514404 0.3315712 0.04749206 0.05660621 0.
     00892847 0.42889586
4888 0.92952211]
4889      -9875.01143470074
4890      [0.2948677 0.33123559 0.04773059 0.05686203 0.
     00891467 0.42890176
4891 0.92930475]
4892      -9874.986199156416
4893
4894 [0.2948677 0.33123559 0.04773059 0.05686203 0.00891467
     0.42890176
4895 0.92930475]
4896 -9874.986199156416
4897 -2937.9632396820907
4898      [0.29491617 0.33131513 0.04804301 0.05726379 0.
     00892343 0.42889374
4899 0.92951858]
4900      -9874.976922674517
4901 The 129 -th iteration of the EM(G) algorithm
4902 [0.2948677 0.33123559 0.04773059 0.05686203 0.00891467 0
     .42890176
4903 0.92930475]
4904 -9864.922035113086
```

```
4905 -2937.94537177075
4906
4907 M-step
4908 [0.2948677  0.33123559  0.04773059  0.05686203  0.00891467  0
     .42890176
4909  0.92930475]
4910 -9864.922035113086
4911 -2937.94537177075
4912      [0.29926138  0.33658259  0.04396707  0.05281311  0.
     00912909  0.42880826
4913  0.9327626 ]
4914      -9868.958431287125
4915      [0.29706454  0.33390909  0.04584883  0.05483757  0.
     00902188  0.42885501
4916  0.93103368]
4917      -9865.82027326015
4918      [0.29596612  0.33257234  0.04678971  0.0558498   0.
     00896828  0.42887838
4919  0.93016922]
4920      -9865.0903689042
4921      [0.29541691  0.33190396  0.04726015  0.05635592  0.
     00894148  0.42889007
4922  0.92973699]
4923      -9864.935906809815
4924      [0.29514231  0.33156978  0.04749537  0.05660898  0.
     00892808  0.42889591
4925  0.92952087]
4926      -9864.911384835172
4927
4928      [0.29514231  0.33156978  0.04749537  0.05660898  0.00892808
     0.42889591
4929  0.92952087]
4930 -9864.911384835172
4931 -2937.9347214928357
4932      [0.295192    0.33165056  0.04780383  0.05700661  0.
     0089365   0.42888799
4933  0.92973347]
4934      -9864.902150749003
4935 The 130 -th iteration of the EM(G) algorithm
4936 [0.29514231  0.33156978  0.04749537  0.05660898  0.00892808  0
     .42889591
4937  0.92952087]
4938 -9854.928176281066
4939 -2937.9172338950984
4940
4941 M-step
4942 [0.29514231  0.33156978  0.04749537  0.05660898  0.00892808  0
     .42889591
4943  0.92952087]
4944 -9854.928176281066
```

```
4945 -2937.9172338950984
4946 [0.29950884 0.33689433 0.04378391 0.05260359 0.
      0091362 0.42880343
4947 0.93295861]
4948 -9858.876746762498
4949 [0.29732557 0.33423205 0.04563964 0.05460628 0.
      00903214 0.42884967
4950 0.93123974]
4951 -9855.806074254799
4952 [0.29623394 0.33290092 0.04656751 0.05560763 0.
      00898011 0.42887279
4953 0.93038031]
4954 -9855.092263484652
4955 [0.29568812 0.33223535 0.04703144 0.0561083 0.
      00895409 0.42888435
4956 0.92995059]
4957 -9854.94140933397
4958 [0.29541522 0.33190256 0.04726341 0.05635864 0.
      00894108 0.42889013
4959 0.92973573]
4960 -9854.917578314718
4961
4962 [0.29541522 0.33190256 0.04726341 0.05635864 0.00894108
      0.42889013
4963 0.92973573]
4964 -9854.917578314718
4965 -2937.906635928751
4966 [0.29546611 0.33198456 0.047568 0.05675224 0.
      00894918 0.42888232
4967 0.92994709]
4968 -9854.90838785607
4969 The 131 -th iteration of the EM(G) algorithm
4970 [0.29541522 0.33190256 0.04726341 0.05635864 0.00894108 0
      .42889013
4971 0.92973573]
4972 -9845.01440958506
4973 -2937.8895178769008
4974
4975 M-step
4976 [0.29541522 0.33190256 0.04726341 0.05635864 0.00894108 0
      .42889013
4977 0.92973573]
4978 -9845.01440958506
4979 -2937.8895178769008
4980 [0.299755 0.33720493 0.04360308 0.05239616 0.
      00914296 0.42879881
4981 0.93315318]
4982 -9848.877577779049
4983 [0.29758511 0.33455375 0.04543324 0.0543774 0.
      00904202 0.42884447
```

```

4984 0.93144445]
4985      -9845.872539100561
4986      [0.29650016 0.33322815 0.04634833 0.05536802 0.
        00899155 0.4288673
4987 0.93059009]
4988      -9845.17437484688
4989      [0.29595769 0.33256536 0.04680587 0.05586333 0.
        00896632 0.42887872
4990 0.93016291]
4991      -9845.027025863114
4992      [0.29568645 0.33223396 0.04703464 0.05611098 0.
        0089537 0.42888442
4993 0.92994932]
4994      -9845.003864732396
4995
4996      [0.29568645 0.33223396 0.04703464 0.05611098 0.0089537
        0.42888442
4997 0.92994932]
4998 -9845.003864732396
4999 -2937.878973024238
5000      [0.29573852 0.33231716 0.04733543 0.05650061 0.
        00896148 0.42887672
5001 0.93015943]
5002      -9844.994718934722
5003 The 132 -th iteration of the EM(G) algorithm
5004 [0.29568645 0.33223396 0.04703464 0.05611098 0.0089537 0
        .42888442
5005 0.92994932]
5006 -9835.179920103357
5007 -2937.8622144435785
5008
5009 M-step
5010 [0.29568645 0.33223396 0.04703464 0.05611098 0.0089537 0
        .42888442
5011 0.92994932]
5012 -9835.179920103357
5013 -2937.8622144435785
5014      [0.29999999 0.33751444 0.04342445 0.05219079 0.
        0091494 0.42879437
5015 0.93334631]
5016      -9838.960117368595
5017      [0.29784322 0.3348742 0.04522954 0.05415089 0.
        00905155 0.4288394
5018 0.93164782]
5019      -9836.018854575037
5020      [0.29676484 0.33355408 0.04613209 0.05513094 0.
        00900263 0.42886191
5021 0.93079857]
5022      -9835.33588838737
5023      [0.29622564 0.33289402 0.04658336 0.05562096 0.

```

```
5023 00897816 0.42887317
5024 0.93037394]
5025 -9835.191941506117
5026 [0.29595605 0.33256399 0.046809 0.05586597 0.
00896593 0.4288788
5027 0.93016163]
5028 -9835.169429150217
5029
5030 [0.29595605 0.33256399 0.046809 0.05586597 0.00896593
0.4288788
5031 0.93016163]
5032 -9835.169429150217
5033 -2937.8517234904384
5034 [0.29600925 0.33264836 0.04710609 0.05625169 0.
00897339 0.42887121
5035 0.93037048]
5036 -9835.160328938493
5037 The 133 -th iteration of the EM(G) algorithm
5038 [0.29595605 0.33256399 0.046809 0.05586597 0.00896593 0
.4288788
5039 0.93016163]
5040 -9825.423781496402
5041 -2937.8353142755077
5042
5043 M-step
5044 [0.29595605 0.33256399 0.046809 0.05586597 0.00896593 0
.4288788
5045 0.93016163]
5046 -9825.423781496402
5047 -2937.8353142755077
5048 [0.30024375 0.33782282 0.04324808 0.05198744 0.
00915556 0.42879015
5049 0.93353804]
5050 -9829.12328041394
5051 [0.2980999 0.3351934 0.04502854 0.05392671 0.
00906075 0.42883447
5052 0.93184984]
5053 -9826.244056410635
5054 [0.29702797 0.3338787 0.04591877 0.05489634 0.
00901334 0.42885663
5055 0.93100573]
5056 -9825.57586923728
5057 [0.29649201 0.33322134 0.04636389 0.05538116 0.
00898964 0.42886771
5058 0.93058368]
5059 -9825.43522827607
5060 [0.29622403 0.33289267 0.04658644 0.05562356 0.
00897778 0.42887326
5061 0.93037266]
5062 -9825.41334506029
```

```

5063
5064 [0.29622403 0.33289267 0.04658644 0.05562356 0.00897778
      0.42887326
5065 0.93037266]
5066 -9825.41334506029
5067 -2937.8248778393954
5068      [0.29627834 0.33297818 0.0468799 0.05600544 0.
      00898493 0.42886579
5069 0.93058024]
5070      -9825.40429135251
5071 The 134 -th iteration of the EM(G) algorithm
5072 [0.29622403 0.33289267 0.04658644 0.05562356 0.00897778 0
      .42887326
5073 0.93037266]
5074 -9815.745178771707
5075 -2937.808808536819
5076
5077 M-step
5078 [0.29622403 0.33289267 0.04658644 0.05562356 0.00897778 0
      .42887326
5079 0.93037266]
5080 -9815.745178771707
5081 -2937.808808536819
5082      [0.30048631 0.33813015 0.04307391 0.05178609 0.
      00916139 0.42878607
5083 0.93372836]
5084      -9819.36620634154
5085      [0.29835517 0.33551141 0.04483017 0.05370483 0.
      00906959 0.42882966
5086 0.93205051]
5087      -9816.547318729188
5088      [0.2972896 0.33420204 0.04570831 0.05466419 0.
      00902369 0.42885146
5089 0.93121158]
5090      -9815.89349998152
5091      [0.29675681 0.33354735 0.04614738 0.05514388 0.
      00900073 0.42886236
5092 0.93079212]
5093      -9815.75607072998
5094      [0.29649042 0.33322001 0.04636691 0.05538372 0.
      00898926 0.42886781
5095 0.93058239]
5096      -9815.734797435878
5097
5098      [0.29649042 0.33322001 0.04636691 0.05538372 0.00898926
      0.42886781
5099 0.93058239]
5100 -9815.734797435878
5101 -2937.79842720099
5102      [0.29654582 0.33330664 0.04665681 0.05576182 0.

```

```
5102 00899609 0.42886046
5103 0.9307887 ]
5104 -9815.725791015764
5105 The 135 -th iteration of the EM(G) algorithm
5106 [0.29649042 0.33322001 0.04636691 0.05538372 0.00898926 0
.42886781
5107 0.93058239]
5108 -9806.143266408615
5109 -2937.782688546018
5110
5111 M-step
5112 [0.29649042 0.33322001 0.04636691 0.05538372 0.00898926 0
.42886781
5113 0.93058239]
5114 -9806.143266408615
5115 -2937.782688546018
5116 [0.30072769 0.33843637 0.04290185 0.05158665 0.
00916698 0.42878214
5117 0.93391726]
5118 -9809.688031783215
5119 [0.29860906 0.33582819 0.04463438 0.05348518 0.
00907812 0.42882497
5120 0.93224982]
5121 -9806.927792445076
5122 [0.29754974 0.3345241 0.04550065 0.05443445 0.
00903369 0.42884639
5123 0.93141611]
5124 -9806.287934661437
5125 [0.29702008 0.33387205 0.04593378 0.05490909 0.
00901147 0.4288571
5126 0.93099925]
5127 -9806.153623464621
5128 [0.29675525 0.33354603 0.04615034 0.0551464 0.
00900037 0.42886245
5129 0.93079082]
5130 -9806.132940899282
5131
5132 [0.29675525 0.33354603 0.04615034 0.0551464 0.00900037
0.42886245
5133 0.93079082]
5134 -9806.132940899282
5135 -2937.7723630366854
5136 [0.2968117 0.33363375 0.04643676 0.05552079 0.
0090069 0.42885524
5137 0.93099585]
5138 -9806.123982450665
5139 The 136 -th iteration of the EM(G) algorithm
5140 [0.29675525 0.33354603 0.04615034 0.0551464 0.00900037 0
.42886245
5141 0.93079082]
```

```
5142 -9796.61713151211
5143 -2937.756945847723
5144
5145 M-step
5146 [0.29675525 0.33354603 0.04615034 0.0551464 0.00900037 0
     .42886245
5147 0.93079082]
5148 -9796.61713151211
5149 -2937.756945847723
5150      [0.30096789 0.33874157 0.04273196 0.05138921 0.
     00917231 0.42877836
5151 0.93410475]
5152      -9800.087649158651
5153      [0.29886157 0.3361438 0.04444115 0.0532678 0.
     00908634 0.42882041
5154 0.93244778]
5155      -9797.384517082373
5156      [0.29780841 0.33484492 0.04529575 0.0542071 0.
     00904335 0.42884143
5157 0.9316193 ]
5158      -9796.758249156093
5159      [0.29728183 0.33419547 0.04572305 0.05467675 0.
     00902186 0.42885194
5160 0.93120506]
5161      -9796.62697112856
5162      [0.29701854 0.33387075 0.04593669 0.05491158 0.
     00901111 0.4288572
5163 0.93099794]
5164      -9796.606862118442
5165
5166      [0.29701854 0.33387075 0.04593669 0.05491158 0.00901111
     0.4288572
5167 0.93099794]
5168 -9796.606862118442
5169 -2937.746676454055
5170      [0.29707601 0.33395954 0.0462197 0.05528231 0.
     00901734 0.42885011
5171 0.93120168]
5172      -9796.597952264809
5173 The 137 -th iteration of the EM(G) algorithm
5174 [0.29701854 0.33387075 0.04593669 0.05491158 0.00901111 0
     .4288572
5175 0.93099794]
5176 -9787.166028979558
5177 -2937.731572337936
5178
5179 M-step
5180 [0.29701854 0.33387075 0.04593669 0.05491158 0.00901111 0
     .4288572
5181 0.93099794]
```

```

5182 -9787.166028979558
5183 -2937.731572337936
5184      [0.30120696 0.33904565 0.04256415 0.05119367 0.
           00917737 0.4287747
5185 0.93429086]
5186      -9790.564311535018
5187      [0.29911275 0.3364582 0.04425042 0.05305262 0.
           00909424 0.42881595
5188 0.9326444 ]
5189      -9787.916747961846
5190      [0.29806565 0.33516448 0.04509356 0.0539821 0.
           00905268 0.42883657
5191 0.93182117]
5192      -9787.303698894677
5193      [0.29754209 0.33451762 0.04551513 0.05444684 0.
           00903189 0.42884688
5194 0.93140955]
5195      -9787.175368963804
5196      [0.29728032 0.33419418 0.04572591 0.05467921 0.
           0090215 0.42885204
5197 0.93120375]
5198      -9787.155816182154
5199
5200      [0.29728032 0.33419418 0.04572591 0.05467921 0.0090215
           0.42885204
5201 0.93120375]
5202 -9787.155816182154
5203 -2937.721359540532
5204      [0.29733879 0.33428402 0.04600557 0.05504634 0.
           00902744 0.42884508
5205 0.9314062 ]
5206      -9787.146955444736
5207 The 138 -th iteration of the EM(G) algorithm
5208 [0.29728032 0.33419418 0.04572591 0.05467921 0.0090215 0
           .42885204
5209 0.93120375]
5210 -9777.789132176074
5211 -2937.706560121218
5212
5213 M-step
5214 [0.29728032 0.33419418 0.04572591 0.05467921 0.0090215 0
           .42885204
5215 0.93120375]
5216 -9777.789132176074
5217 -2937.706560121218
5218      [0.30144484 0.33934872 0.04239843 0.05100003 0.
           00918223 0.42877119
5219 0.93447561]
5220      -9781.117100590149
5221      [0.29936258 0.33677145 0.04406217 0.05283962 0.

```

```

5221 00910187 0.42881162
5222 0.93283968]
5223 -9778.523636118829
5224 [0.29832145 0.33548282 0.04489404 0.05375941 0.
00906169 0.42883183
5225 0.93202171]
5226 -9777.923452021
5227 [0.29780088 0.3348385 0.04530998 0.05421931 0.
00904159 0.42884193
5228 0.93161273]
5229 -9777.797989218481
5230 [0.2975406 0.33451634 0.04551794 0.05444926 0.
00903155 0.42884699
5231 0.93140824]
5232 -9777.778976271675
5233
5234 [0.2975406 0.33451634 0.04551794 0.05444926 0.00903155
0.42884699
5235 0.93140824]
5236 -9777.778976271675
5237 -2937.6964042168183
5238 [0.29760005 0.3346072 0.04579433 0.05481286 0.
00903721 0.42884016
5239 0.93160939]
5240 -9777.770165178421
5241 The 139 -th iteration of the EM(G) algorithm
5242 [0.2975406 0.33451634 0.04551794 0.05444926 0.00903155 0
.42884699
5243 0.93140824]
5244 -9768.485665021146
5245 -2937.6819014921666
5246
5247 M-step
5248 [0.2975406 0.33451634 0.04551794 0.05444926 0.00903155 0
.42884699
5249 0.93140824]
5250 -9768.485665021146
5251 -2937.6819014921666
5252 [0.30168161 0.33965075 0.04223474 0.05080826 0.
00918684 0.42876777
5253 0.93465895]
5254 -9771.745182897275
5255 [0.2996111 0.33708354 0.04387634 0.05262876 0.
00910919 0.42880738
5256 0.93303359]
5257 -9769.204392090298
5258 [0.29857585 0.33579994 0.04469714 0.05353901 0.
00907037 0.42882718
5259 0.93222092]
5260 -9768.616729621546

```

```

5261 [0.29805823 0.33515814 0.04510754 0.05399414 0.
      00905096 0.42883709
5262 0.93181458]
5263 -9768.494055364557
5264 [0.29779941 0.33483724 0.04531274 0.0542217 0.
      00904125 0.42884204
5265 0.93161141]
5266 -9768.47556632546
5267
5268 [0.29779941 0.33483724 0.04531274 0.0542217 0.00904125
      0.42884204
5269 0.93161141]
5270 -9768.47556632546
5271 -2937.6718027964807
5272 [0.29785981 0.33492911 0.04558592 0.05458182 0.
      00904663 0.42883534
5273 0.93181127]
5274 -9768.466805235597
5275 The 140 -th iteration of the EM(G) algorithm
5276 [0.29779941 0.33483724 0.04531274 0.0542217 0.00904125 0
      .42884204
5277 0.93161141]
5278 -9759.254848549295
5279 -2937.6575890045006
5280
5281 M-step
5282 [0.29779941 0.33483724 0.04531274 0.0542217 0.00904125 0
      .42884204
5283 0.93161141]
5284 -9759.254848549295
5285 -2937.6575890045006
5286 [0.3019173 0.33995173 0.04207309 0.05061837 0.
      00919125 0.42876446
5287 0.93484093]
5288 -9762.447706080908
5289 [0.29985836 0.33739449 0.04369292 0.05242003 0.
      00911625 0.42880325
5290 0.93322617]
5291 -9759.95821902584
5292 [0.29882889 0.33611587 0.04450283 0.05332087 0.
      00907875 0.42882264
5293 0.93241879]
5294 -9759.38274853894
5295 [0.29831415 0.33547655 0.04490779 0.05377128 0.
      00906 0.42883234
5296 0.9320151 ]
5297 -9759.262787533997
5298 [0.29805678 0.3351569 0.04511026 0.05399649 0.
      00905063 0.42883719
5299 0.93181325]

```

```

5300          -9759.244807225867
5301
5302 [0.29805678 0.3351569  0.04511026 0.05399649 0.00905063
      0.42883719
5303 0.93181325]
5304 -9759.244807225867
5305 -2937.647547681072
5306 [0.29811811 0.33524974 0.04538029 0.05435318 0.
      00905574 0.42883062
5307 0.93201181]
5308          -9759.236096548866
5309 The 141 -th iteration of the EM(G) algorithm
5310 [0.29805678 0.3351569  0.04511026 0.05399649 0.00905063 0
      .42883719
5311 0.93181325]
5312 -9750.095929401308
5313 -2937.6336153583215
5314
5315 M-step
5316 [0.29805678 0.3351569  0.04511026 0.05399649 0.00905063 0
      .42883719
5317 0.93181325]
5318 -9750.095929401308
5319 -2937.6336153583215
5320 [0.30215185 0.34025169 0.04191341 0.05043028 0.
      00919546 0.42876125
5321 0.93502157]
5322          -9753.223883475328
5323 [0.30010432 0.33770429 0.04351184 0.05221338 0.
      00912304 0.42879922
5324 0.93341741]
5325          -9750.784356239903
5326 [0.29908055 0.3364306  0.04431105 0.05310494 0.
      00908684 0.4288182
5327 0.93261533]
5328          -9750.220754089081
5329 [0.29856867 0.33579375 0.04471066 0.05355071 0.
      00906873 0.4288277
5330 0.93221429]
5331          -9750.103432290314
5332 [0.29831272 0.33547532 0.04491046 0.0537736 0.
      00905968 0.42883244
5333 0.93201377]
5334          -9750.085945721581
5335 The 142 -th iteration of the EM(G) algorithm
5336 [0.29805678 0.3351569  0.04511026 0.05399649 0.00905063 0
      .42883719
5337 0.93181325]
5338 -9750.095929401308
5339 -2937.6336153583215

```

```
5340 EM has converged!
5341 finish
5342 PyDev console: using IPython 6.4.0
5343
5344 Python 3.6.5 |Anaconda, Inc.| (default, Apr 26 2018, 08:
   42:37)
5345 [GCC 4.2.1 Compatible Clang 4.0.1 (tags/RELEASE_401/final
   )] on darwin
5346
```