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1 "C:\Program Files\Python38\python.exe" "C:/Users/Ivan  
Kalinichenka/.AA_Programming/Projects/AA_KnabCase/  
Predicting-Cross-Sell/main.py"  
2 ****Processing data, at 06:42:56***  
3 ****Reading df list of time series data from file***  
4 sample size: 1341  
5 number of periods: 12  
6 ****Transforming datasets & adding some variables at 06:42:  
56***  
7 Taking log of saldototaal, minimum that gets added to log  
: -66.66  
8 Taking log of logins_totaal, minimum that gets added to log  
: 0.0  
9 Taking log of aantaltransacties_totaal, minimum that gets  
added to log: 0.0  
10 Taking log of saldototaal, minimum that gets added to log  
: -200.77  
11 Taking log of logins_totaal, minimum that gets added to log  
: 0.0  
12 Taking log of aantaltransacties_totaal, minimum that gets  
added to log: 0.0  
13 Taking log of saldototaal, minimum that gets added to log  
: -89.05  
14 Taking log of logins_totaal, minimum that gets added to log  
: 0.0  
15 Taking log of aantaltransacties_totaal, minimum that gets  
added to log: 0.0  
16 Taking log of saldototaal, minimum that gets added to log  
: -108.97  
17 Taking log of logins_totaal, minimum that gets added to log  
: 0.0  
18 Taking log of aantaltransacties_totaal, minimum that gets  
added to log: 0.0  
19 Taking log of saldototaal, minimum that gets added to log  
: -74.89  
20 Taking log of logins_totaal, minimum that gets added to log  
: 0.0  
21 Taking log of aantaltransacties_totaal, minimum that gets  
added to log: 0.0  
22 Taking log of saldototaal, minimum that gets added to log  
: -89.89  
23 Taking log of logins_totaal, minimum that gets added to log  
: 0.0  
24 Taking log of aantaltransacties_totaal, minimum that gets  
added to log: 0.0  
25 Taking log of saldototaal, minimum that gets added to log
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25 : -104.89
26 Taking log of logins_totaal, minimum that gets added to log
: 0.0
27 Taking log of aantaltransacties_totaal, minimum that gets
added to log: 0.0
28 Taking log of saldototaal, minimum that gets added to log
: -119.89
29 Taking log of logins_totaal, minimum that gets added to log
: 0.0
30 Taking log of aantaltransacties_totaal, minimum that gets
added to log: 0.0
31 Taking log of saldototaal, minimum that gets added to log
: -134.89
32 Taking log of logins_totaal, minimum that gets added to log
: 0.0
33 Taking log of aantaltransacties_totaal, minimum that gets
added to log: 0.0
34 Taking log of saldototaal, minimum that gets added to log
: -149.89
35 Taking log of logins_totaal, minimum that gets added to log
: 0.0
36 Taking log of aantaltransacties_totaal, minimum that gets
added to log: 0.0
37 Taking log of saldototaal, minimum that gets added to log
: -694.28
38 Taking log of logins_totaal, minimum that gets added to log
: 0.0
39 Taking log of aantaltransacties_totaal, minimum that gets
added to log: 0.0
40 Taking log of saldototaal, minimum that gets added to log
: -179.89
41 Taking log of logins_totaal, minimum that gets added to log
: 0.0
42 Taking log of aantaltransacties_totaal, minimum that gets
added to log: 0.0
43 Doing a check that the ID columns are the same
44 Data creation finished! Total time: 0:00:01
45 Dummy variables made:
46 ['income_1.0', 'income_2.0', 'income_3.0', 'income_4.0', 'income_5.0', 'age_bins_(0, 18]', 'age_bins_(18, 30]', 'age_bins_(30, 40]', 'age_bins_(40, 50]', 'age_bins_(50, 65]', 'age_bins_(65, 200]', 'geslacht_Man', 'geslacht_Man(nen) en vrouw(en)', 'geslacht_Vrouw']
47 Dummy variables made:
48 ['income_1.0', 'income_2.0', 'income_3.0', 'income_4.0', 'income_5.0', 'age_bins_(0, 18]', 'age_bins_(18, 30]', '
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48 age_bins_(30, 40]', 'age_bins_(40, 50]', 'age_bins_(50, 65]
  ]', 'age_bins_(65, 200]', 'geslacht_Man', 'geslacht_Man(nen
  ) en vrouw(en)', 'geslacht_Vrouw', 'hh_size_1.0', '
  hh_size_2.0', 'hh_size_3.0', 'hh_size_4.0', 'hh_size_5.0
  ', 'saldototaal_bins_(-inf, 0.0]', 'saldototaal_bins_(0.0,
  100.0]', 'saldototaal_bins_(100.0, 1000.0]', '
  saldototaal_bins_(1000.0, 5000.0]', 'saldototaal_bins_(5000
  .0, 15000.0]', 'saldototaal_bins_(15000.0, 50000.0]', '
  saldototaal_bins_(50000.0, inf]', 'businessType_Besloten
  Vennootschap', 'businessType_Eenmanszaak', '
  businessType_Maatschap/Stichting', '
  businessType_Vennootschap onder firma', '
  businessType_meerdere']
49 ****Defining variables to use at 06:42:57****
50 Running cross sell model
51 ****Running HMM at 06:42:57****
52 dependent variable: ['business_max', 'retail_max', '
  joint_max', 'accountoverlay_max']
53 covariates: ['log_logins_totaal', '
  log_aantaltransacties_totaal', 'income_2.0', 'income_3.0
  ', 'income_4.0', 'income_5.0', 'age_bins_(30, 40]', '
  age_bins_(40, 50]', 'age_bins_(50, 65]', 'age_bins_(65, 200
  ]', 'geslacht_Vrouw', 'hh_size_2.0', 'hh_size_3.0', '
  hh_size_4.0', 'hh_size_5.0', 'saldototaal_bins_(-inf, 0.0
  ]', 'saldototaal_bins_(100.0, 1000.0]', 'saldototaal_bins_(
  1000.0, 5000.0]', 'saldototaal_bins_(5000.0, 15000.0]', '
  saldototaal_bins_(15000.0, 50000.0]', 'saldototaal_bins_(
  50000.0, inf]', 'businessType_Besloten Vennootschap', '
  businessType_Eenmanszaak', 'businessType_Maatschap/
  Stichting', 'businessType_Vennootschap onder firma', '
  businessType_meerdere']
54 number of periods: 6
55 number of segments: 4
56 number of people: 1341
57 regularization term: 0.05
58 Starting values: [ 3.35016239e-03, -2.40257677e-02, -9.
  79506452e-01, -7.94965052e-05, -3.77881350e-01, 1.86814035e
  -03, -1.15539840e-15, -4.02395782e+00, 1.51571059e+00, -3.
  06792025e-04, 3.62782887e-03, -2.08705432e-04, -9.11641102e
  -04, -1.42462389e+00, -8.34496221e-04, -1.33250301e-01, -2.
  21315450e-03, -1.53967996e-04, 1.10096514e-08, 2.38256774e+
  00, 5.88304103e-03, -9.23085174e-07, -1.15369019e-03, 2.
  75367376e+01, -3.01028420e-03, 2.31592996e+01, 1.05993481e-
  10, 6.50161743e+00, -1.21259642e+00, 3.93027743e-01, 1.
  94021302e-03, 3.20951746e+00, 2.21201352e-13, 1.53263862e+
  00, -3.59286274e+00, 7.51959894e-02, -2.80312539e+00, -2.

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58	67887369e-03, -8.02686905e-01, 4.11309420e-02, -2.
	51202894e-08, 2.14827998e+00, -2.33706901e-02, 1.13431199e
	-05, -2.12548348e+00, 1.47269738e-03, 4.31744470e+00, -1.
	27322855e-06, 7.21898981e-05, 1.71967135e+01, -1.29242653e
	-05, -8.78829027e-13, 1.06793157e+01, -7.45314364e-01, 1.
	51055320e+01, -1.24328584e+00, 2.52586396e-01, -1.
	34115181e-08, 7.96737029e-01, -4.17876611e-04, 1.39533385e
	-03, -1.34615953e+00, 1.78642973e+00, -1.46042497e-03, -3.
	15918707e-02, 1.36416252e-03, -6.82104948e-03, 1.78953295e
	-05, 1.42813612e+00, 1.74467193e-03, 3.05728601e-03, -1.
	21313626e-05, 7.17928833e-04, 3.38806462e+00, 1.77060404e
	-02, -3.87583199e-03, -5.45615023e-10, -3.80650417e-10, -1.
	25103621e+01, -5.06017853e-11, -1.60018494e+01, -6.
	37479121e-04, -1.56655743e-05, -1.06873210e+00, 1.
	03881997e-02, -2.18109738e-04, -3.79763807e-04, 4.
	41834177e-04, -1.36841309e-02, 2.90407979e+00, 3.83964248e
	+00, 9.69465243e+00, -8.76624257e-03, 1.63032556e-03, 1.
	04924916e+00, 1.22868122e-05, -1.45217578e-07, 5.99177611e
	-07, -7.64115600e-04, 4.92352456e-02, 1.67940013e-04, 9.
	89765030e-05, -5.54356887e-03, 1.33368329e+00, 1.27283354e
	-02, 1.09817833e-02, 8.95652082e-07, 1.12541228e-07, -3.
	17554807e-06, 1.29711178e-05, 1.72982630e-03, -2.21412880e
	-03, 4.52470881e-04, -1.60926076e-03, 5.08691335e-03, 1.
	42919625e-03, -8.31817111e-04, 2.27364891e-03, -1.
	47688469e-03, 1.99895284e+00, -5.11473086e-02, 1.92994539e
	-02, -8.50305831e-10, 7.81512247e-04, 2.05403381e-04, -2.
	06557929e-07, -2.31461887e-08, -5.04940798e-11, -7.
	81818262e-05, -1.02961359e-02, -1.54404241e-08, 2.
	43824533e-06, -1.87152474e-06, 6.57941654e-06, 5.27872474e
	-07, 3.68831772e-07, 5.43170797e-02, -1.79053139e-02, -3.
	32377969e-05, 4.89271768e-06, 1.56996391e+01, 1.68962469e
	+01, 4.12212085e-01, 1.38261654e+01, 1.33567302e+01, 2.
	08140747e+00, 8.36830280e-08, 1.22610096e-04, -2.43387774e
	-05, 1.34483311e-06, 6.57597971e-01, 4.05916143e-01, -2.
	99968875e-04, -5.57573485e-05, -3.91841469e-04, 2.
	97585407e-04, -7.78745810e-02, -1.40898197e-06, -2.
	13444895e-04, -4.94779176e-03, 8.14466396e-02, 2.25063720e
	-04, 4.56931567e-05, 3.62745704e-04, 1.71003182e-04, -9.
	71147102e-06, 3.37777436e-05, -3.58021939e-11, -1.
	25759510e+01, -2.10274440e-11, 9.76385633e-07, 9.59291235e
	+00, 8.42738828e+00, -7.24068092e+00, -5.36927696e-04, -5.
	16857547e-01, 8.13003225e-01, -6.34438672e+00, 1.05927274e
	+01, 1.26283957e+01, -3.34409198e-05, 9.90773786e-02, -6.
	51913860e-01, 8.71134877e-01, -6.76287751e-01, -1.
	07244000e+01, -7.26752445e+00, -1.88467173e+01, 1.
	32012476e+00, -3.43978629e-01, -9.80957770e+00, -9.

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58 56270514e+00, -8.62496377e-01, -4.27016951e+00, 7.  
29597798e+00, 1.37813079e+00, -3.61576910e-01, -1.  
73668805e+00, -1.97076592e+00]  
59 ****Starting EM prodecure, at 06:42:57****  
60 tolerance: 0.001  
61 number of parameters: 199  
62 maximization method: Nelder-Mead  
63 random starting points: True  
64 E-step duration: 0:00:03  
65 function value: 11642.567484186246 at iteration 1000  
66 function value: 11642.53639950841 at iteration 2000  
67 function value: 11642.525526846475 at iteration 3000  
68 function value: 11642.522371412902 at iteration 4000  
69 function value: 11642.519506314195 at iteration 5000  
70 Optimization terminated successfully.  
71 Current function value: 11642.517670  
72 Iterations: 5272  
73 Function evaluations: 5809  
74  
75 10 largest Differences in logl according to simplex  
before termination:  
76 [0.00074893 0.00074991 0.00075028 0.00075391 0.00075409 0  
.0007627  
77 0.00076399 0.00076627 0.00076763 0.00076775]  
78  
79 10 largest Differences in logl according to simplex at  
termination:  
80 [0.00098123 0.00098222 0.00098258 0.00098622 0.00098639 0  
.00099501  
81 0.00099629 0.00099858 0.00099993 0.00100006]  
82  
83 10 largest Differences in x according to simplex before  
termination:  
84 [0.05911767 0.06999757 0.07110941 0.07938527 0.0798262 0  
.08194937  
85 0.09444171 0.09633161 0.10396331 0.11896505]  
86  
87 10 largest Differences in x according to simplex at  
termination:  
88 [0.05815936 0.0642311 0.06916148 0.07650295 0.07840356 0  
.08933139  
89 0.09272887 0.09621551 0.09691155 0.09747627]  
90 Finished iteration 0, duration M step 0:02:42  
91 [ 3.26975644e-03 -2.40317092e-02 -9.64635527e-01 -7.  
99715829e-05  
92 -4.08861564e-01 1.87508664e-03 -1.16239502e-15 -4.
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92	03948601e+00				
93	1.49513616e+00	-3.07920354e-04	3.66774819e-03	-2.	
	09372586e-04				
94	-8.69873829e-04	-1.48926750e+00	-8.46496314e-04	-1.	
	22483181e-01				
95	-2.22631380e-03	-1.56075570e-04	1.11211614e-08	2.	
	42772532e+00				
96	5.79780134e-03	-9.27133928e-07	-1.17319840e-03	2.	
	75042091e+01				
97	-3.09903359e-03	2.32471348e+01	1.07754604e-10	6.	
	50176285e+00				
98	-1.21245734e+00	3.91548382e-01	1.95805777e-03	3.	
	23247284e+00				
99	2.23115839e-13	1.54397245e+00	-3.60995311e+00	7.	
	53117655e-02				
100	-2.80438850e+00	-2.67182312e-03	-7.99397746e-01	4.	
	11234483e-02				
101	-2.63025526e-08	2.16461929e+00	-2.33483271e-02	1.	
	12977807e-05				
102	-2.19936842e+00	1.47404935e-03	4.27837400e+00	-1.	
	26202716e-06				
103	7.23315405e-05	1.72050647e+01	-1.28078229e-05	-8.	
	92082474e-13				
104	1.05901360e+01	-7.28217535e-01	1.50994118e+01	-1.	
	24385458e+00				
105	2.53981147e-01	-1.34317130e-08	7.86300137e-01	-4.	
	21471881e-04				
106	1.40080429e-03	-1.31767923e+00	1.77449599e+00	-1.	
	44069012e-03				
107	-3.14933693e-02	1.38118973e-03	-6.83812845e-03	1.	
	78605088e-05				
108	1.43869511e+00	1.74619789e-03	3.04520909e-03	-1.	
	21680976e-05				
109	7.06444309e-04	3.35779129e+00	1.72409754e-02	-3.	
	85068843e-03				
110	-5.53459945e-10	-3.83303297e-10	-1.24752885e+01	-5.	
	08142648e-11				
111	-1.60177974e+01	-6.45165972e-04	-1.59380841e-05	-1.	
	08801646e+00				
112	9.90715045e-03	-2.15771776e-04	-3.72761324e-04	4.	
	45573947e-04				
113	-1.36759550e-02	2.76295958e+00	3.75503062e+00	9.	
	64761128e+00				
114	-8.62688027e-03	1.54967724e-03	1.08700238e+00	1.	
	24622331e-05				
115	-1.45073060e-07	5.94036221e-07	-7.87214934e-04	4.	

115	96893618e-02				
116	1.67953198e-04	9.94175648e-05	-5.54807079e-03	1.	
	36761089e+00				
117	1.26137997e-02	1.09163582e-02	9.00714640e-07	1.	
	13287807e-07				
118	-3.15465958e-06	1.32511959e-05	1.72769710e-03	-2.	
	22836567e-03				
119	4.53046474e-04	-1.61912077e-03	5.10590273e-03	1.	
	39395265e-03				
120	-8.28089514e-04	2.28383022e-03	-1.48375240e-03	1.	
	95765837e+00				
121	-5.09304918e-02	1.94787780e-02	-8.86134299e-10	7.	
	87621147e-04				
122	2.05858558e-04	-2.04032120e-07	-2.35453766e-08	-4.	
	80810427e-11				
123	-7.59097258e-05	-1.03238386e-02	-1.54895070e-08	2.	
	43732755e-06				
124	-1.87795838e-06	6.51949534e-06	5.24193687e-07	3.	
	58067470e-07				
125	5.42142160e-02	-1.80587195e-02	-3.35873401e-05	5.	
	03077389e-06				
126	1.58381382e+01	1.70035841e+01	3.92173817e-01	1.	
	39646586e+01				
127	1.34433240e+01	2.07200025e+00	8.43392503e-08	1.	
	23339186e-04				
128	-2.40983941e-05	1.35409105e-06	6.46144072e-01	4.	
	01660761e-01				
129	-3.03942702e-04	-5.62646404e-05	-3.91320620e-04	2.	
	97156016e-04				
130	-7.34814578e-02	-1.39959075e-06	-2.14185427e-04	-4.	
	95773618e-03				
131	8.15171598e-02	2.24425846e-04	4.77742883e-05	3.	
	95535903e-04				
132	1.72742681e-04	-9.24815277e-06	3.27807089e-05	-3.	
	52317427e-11				
133	-1.26344523e+01	-2.11228715e-11	9.79762369e-07	9.	
	59012874e+00				
134	8.42221811e+00	-7.22296960e+00	-5.29501139e-04	-5.	
	11804338e-01				
135	8.10802170e-01	-6.37867341e+00	1.05922265e+01	1.	
	26280278e+01				
136	-3.37556489e-05	9.97793225e-02	-6.52814693e-01	8.	
	71671323e-01				
137	-6.75100973e-01	-1.06974518e+01	-7.26386407e+00	-1.	
	88230606e+01				
138	1.32063815e+00	-3.43993786e-01	-9.83366798e+00	-9.	

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138 59646876e+00
139 -8.62310743e-01 -4.26963613e+00 7.29571622e+00 1.
37778943e+00
140 -3.61281998e-01 -1.73630985e+00 -1.97277530e+00]
141 E-step duration: 0:00:03
142 function value: 11642.332766248875 at iteration 1000
143 function value: 11642.301306102487 at iteration 2000
144 function value: 11642.297830812558 at iteration 3000
145 function value: 11642.29445534877 at iteration 4000
146 function value: 11642.291923161285 at iteration 5000
147 Optimization terminated successfully.
148         Current function value: 11642.290432
149         Iterations: 5005
150         Function evaluations: 5560
151
152 10 largest Differences in logl according to simplex
before termination:
153 [0.00064213 0.00064313 0.00064354 0.00064459 0.00064491 0
.00064524
154 0.00064679 0.00064864 0.00064904 0.00064979]
155
156 10 largest Differences in logl according to simplex at
termination:
157 [0.00080355 0.00080454 0.00080495 0.000806 0.00080632 0
.00080665
158 0.0008082 0.00081005 0.00081045 0.0008112 ]
159
160 10 largest Differences in x according to simplex before
termination:
161 [0.04725039 0.04788506 0.05161233 0.05341095 0.06013388 0
.06131374
162 0.06737989 0.07349858 0.08342239 0.10073687]
163
164 10 largest Differences in x according to simplex at
termination:
165 [0.04602112 0.04640872 0.04928442 0.04940365 0.05012242 0
.06033761
166 0.06253456 0.06959046 0.08047464 0.09555474]
167 Finished iteration 1, duration M step 0:02:36
168 [ 3.26574834e-03 -2.39937329e-02 -9.53066885e-01 -7.
98563338e-05
169 -4.18231121e-01 1.85817917e-03 -1.15773250e-15 -4.
04439296e+00
170 1.46411937e+00 -2.94089217e-04 3.64703080e-03 -2.
12503892e-04
171 -8.70463700e-04 -1.51733154e+00 -8.39438585e-04 -1.
```

171	19305207e-01					
172	-2.20446403e-03	-1.67215588e-04	1.10498651e-08	2.		
	48223921e+00					
173	5.66746998e-03	-8.98358887e-07	-1.16559996e-03	2.		
	74796752e+01					
174	-3.02671983e-03	2.33031025e+01	1.06375380e-10	6.		
	49281047e+00					
175	-1.21420583e+00	3.90985015e-01	1.94219571e-03	3.		
	26532660e+00					
176	2.21840345e-13	1.54129014e+00	-3.60360280e+00	7.		
	68495677e-02					
177	-2.79954802e+00	-2.71626561e-03	-8.02057038e-01	4.		
	08929737e-02					
178	-2.51728939e-08	2.17809934e+00	-2.35412953e-02	1.		
	13746096e-05					
179	-2.24599466e+00	1.46034476e-03	4.22557259e+00	-1.		
	26064175e-06					
180	7.28779251e-05	1.72493623e+01	-1.22636653e-05	-8.		
	80387606e-13					
181	1.05120866e+01	-7.15588515e-01	1.51154493e+01	-1.		
	24373982e+00					
182	2.53351812e-01	-1.34594517e-08	7.99980190e-01	-4.		
	21539955e-04					
183	1.43059072e-03	-1.31104857e+00	1.78239614e+00	-1.		
	45578410e-03					
184	-3.11881767e-02	1.38101503e-03	-6.69421406e-03	1.		
	78041403e-05					
185	1.44654388e+00	1.73152196e-03	3.03501219e-03	-1.		
	22690386e-05					
186	7.15829974e-04	3.36919091e+00	1.71374378e-02	-3.		
	86167044e-03					
187	-5.54137427e-10	-3.80711305e-10	-1.25835368e+01	-5.		
	08603057e-11					
188	-1.60570349e+01	-6.22397461e-04	-1.61442975e-05	-1.		
	12809145e+00					
189	9.79152026e-03	-2.15561145e-04	-3.70734550e-04	4.		
	50205003e-04					
190	-1.40876750e-02	2.69211227e+00	3.69379313e+00	9.		
	63239142e+00					
191	-8.55717262e-03	1.58085043e-03	1.13178425e+00	1.		
	26598474e-05					
192	-1.44305247e-07	5.98363059e-07	-7.85895319e-04	5.		
	03941022e-02					
193	1.74127643e-04	1.01102745e-04	-5.53274443e-03	1.		
	39442079e+00					
194	1.25000060e-02	1.08780706e-02	9.22072411e-07	1.		

194	13574399e-07			
195	-3.16630888e-06	1.28452353e-05	1.70750272e-03	-2.
	29796627e-03			
196	4.59859380e-04	-1.61300876e-03	5.07728612e-03	1.
	31382619e-03			
197	-8.24085067e-04	2.26089491e-03	-1.46279121e-03	1.
	92315521e+00			
198	-5.05665466e-02	1.95574658e-02	-8.70768191e-10	7.
	74938338e-04			
199	2.05380578e-04	-2.09919867e-07	-2.34861335e-08	-4.
	73865478e-11			
200	-7.75049365e-05	-1.04199181e-02	-1.53456396e-08	2.
	43542075e-06			
201	-1.91223660e-06	6.44924933e-06	5.26504156e-07	3.
	59366477e-07			
202	5.42611621e-02	-1.80914397e-02	-3.03163870e-05	5.
	02499150e-06			
203	1.59246260e+01	1.71050157e+01	3.85324734e-01	1.
	40606356e+01			
204	1.35119602e+01	2.05995809e+00	8.45316435e-08	1.
	25280959e-04			
205	-2.40843630e-05	1.35680595e-06	6.40820485e-01	3.
	97265778e-01			
206	-3.04245308e-04	-5.64288628e-05	-3.90690693e-04	3.
	12252147e-04			
207	-7.27512816e-02	-1.44240661e-06	-2.17980108e-04	-5.
	04828413e-03			
208	8.09626754e-02	2.23424185e-04	4.76882256e-05	3.
	95465274e-04			
209	1.73121639e-04	-9.14912475e-06	3.27087108e-05	-3.
	51064505e-11			
210	-1.27546274e+01	-2.10979249e-11	9.91778476e-07	9.
	59575436e+00			
211	8.42282364e+00	-7.21850411e+00	-5.62429990e-04	-5.
	08659912e-01			
212	8.07186576e-01	-6.39287800e+00	1.05918205e+01	1.
	26274917e+01			
213	-3.53187440e-05	1.00611802e-01	-6.53930742e-01	8.
	72369451e-01			
214	-6.73476079e-01	-1.07441033e+01	-7.24959969e+00	-1.
	88507507e+01			
215	1.32103739e+00	-3.44632910e-01	-9.82608714e+00	-9.
	57200611e+00			
216	-8.62568653e-01	-4.26902284e+00	7.29635019e+00	1.
	37730966e+00			
217	-3.60950911e-01	-1.73706992e+00	-1.97221968e+00]	

```
218 norm absolute difference alpha: 0.023892220134589626
219 norm absolute difference beta: 0.43106917160581915
220 LogLikelihood value: 11608.428486382852
221 Difference LogLikelihood value: -0.3643521690319176
222 breakpoint
223 E-step duration: 0:00:03
224 function value: 11642.11861134811 at iteration 1000
225 function value: 11642.09477536494 at iteration 2000
226 function value: 11642.087543342099 at iteration 3000
227 Optimization terminated successfully.
228     Current function value: 11642.083422
229     Iterations: 3306
230     Function evaluations: 3839
231
232 10 largest Differences in logl according to simplex
before termination:
233 [0.00134626 0.00134822 0.00135551 0.00135573 0.00135667 0
.00135769
234 0.00139575 0.00139618 0.00139652 0.0014027 ]
235
236 10 largest Differences in logl according to simplex at
termination:
237 [0.00153233 0.00153429 0.00154157 0.0015418 0.00154274 0
.00154376
238 0.00158182 0.00158225 0.00158259 0.00158877]
239
240 10 largest Differences in x according to simplex before
termination:
241 [0.06666089 0.06720858 0.0749214 0.07688838 0.07693463 0
.08062509
242 0.08968548 0.09029335 0.09334621 0.1071963 ]
243
244 10 largest Differences in x according to simplex at
termination:
245 [0.06404483 0.06590668 0.07373134 0.08129272 0.0835812 0
.08596895
246 0.08699088 0.08757062 0.08788961 0.09248084]
247 Finished iteration 2, duration M step 0:01:48
248 [ 3.27739395e-03 -2.32976966e-02 -9.44438207e-01 -8.
04060482e-05
249 -4.25194294e-01 1.85400366e-03 -1.15559163e-15 -4.
05502518e+00
250 1.45572522e+00 -2.95766048e-04 3.72448908e-03 -2.
14685473e-04
251 -8.67252551e-04 -1.52922437e+00 -8.41718410e-04 -1.
18029598e-01
```

252	-2.24880627e-03	-1.69341045e-04	1.10790879e-08	2.
	54492692e+00			
253	5.70196617e-03	-8.79276471e-07	-1.16543326e-03	2.
	74105449e+01			
254	-3.06677378e-03	2.33364204e+01	1.05993989e-10	6.
	48735726e+00			
255	-1.21437387e+00	3.90816032e-01	1.94658186e-03	3.
	27589125e+00			
256	2.20898808e-13	1.53926734e+00	-3.61195171e+00	7.
	71268747e-02			
257	-2.79245602e+00	-2.71721192e-03	-7.92860741e-01	4.
	07064255e-02			
258	-2.49568034e-08	2.17798265e+00	-2.35558257e-02	1.
	14111791e-05			
259	-2.25310344e+00	1.46478105e-03	4.19839564e+00	-1.
	26685521e-06			
260	7.28443091e-05	1.72984171e+01	-1.23090424e-05	-8.
	78321906e-13			
261	1.04847372e+01	-7.06798060e-01	1.51021636e+01	-1.
	24645790e+00			
262	2.54472008e-01	-1.33300747e-08	7.98558235e-01	-4.
	23815594e-04			
263	1.43681459e-03	-1.31333928e+00	1.76508692e+00	-1.
	46346783e-03			
264	-3.11387566e-02	1.38090425e-03	-6.70160595e-03	1.
	78836386e-05			
265	1.44823520e+00	1.73197223e-03	3.04360575e-03	-1.
	21980709e-05			
266	7.21340076e-04	3.32723203e+00	1.72497754e-02	-3.
	89654539e-03			
267	-5.53039037e-10	-3.79659322e-10	-1.25894684e+01	-5.
	07414972e-11			
268	-1.60547651e+01	-6.24605857e-04	-1.62748057e-05	-1.
	14850628e+00			
269	9.82744538e-03	-2.13208851e-04	-3.73541415e-04	4.
	53371061e-04			
270	-1.40950563e-02	2.64224847e+00	3.62536063e+00	9.
	65747870e+00			
271	-8.58299708e-03	1.58364439e-03	1.17828912e+00	1.
	27435926e-05			
272	-1.43091512e-07	5.94860766e-07	-7.86061204e-04	5.
	08629025e-02			
273	1.74877281e-04	1.01350266e-04	-5.52275609e-03	1.
	41776658e+00			
274	1.24786333e-02	1.08711652e-02	8.33318556e-07	1.
	14400172e-07			

275	-3.16647078e-06	1.29087700e-05	1.72392566e-03	-2.
	29654624e-03			
276	4.63681174e-04	-1.61581007e-03	5.09983105e-03	1.
	27501056e-03			
277	-8.22853396e-04	2.26283247e-03	-1.46173294e-03	1.
	89900227e+00			
278	-5.09208385e-02	1.95391136e-02	-8.68746208e-10	7.
	75607851e-04			
279	2.06390055e-04	-2.09686882e-07	-2.34331666e-08	-4.
	72173248e-11			
280	-7.62272753e-05	-1.04469870e-02	-1.53937309e-08	2.
	44251894e-06			
281	-1.92489132e-06	6.45486425e-06	5.22184741e-07	3.
	56466959e-07			
282	5.38437119e-02	-1.82223426e-02	-3.03871405e-05	5.
	04086419e-06			
283	1.59833246e+01	1.71880744e+01	3.73262897e-01	1.
	41108783e+01			
284	1.35067863e+01	2.05128646e+00	8.44273006e-08	1.
	26560070e-04			
285	-2.41378263e-05	1.35411571e-06	6.38158507e-01	3.
	88610952e-01			
286	-3.04254628e-04	-5.68246693e-05	-3.95169737e-04	3.
	12976173e-04			
287	-7.23148023e-02	-1.44203667e-06	-2.19109940e-04	-5.
	05893824e-03			
288	8.08529660e-02	2.24366528e-04	4.79527551e-05	3.
	96748962e-04			
289	1.74608303e-04	-9.19060203e-06	3.28667517e-05	-3.
	49536231e-11			
290	-1.27921107e+01	-2.10385084e-11	1.01973946e-06	9.
	59223179e+00			
291	8.42378233e+00	-7.21960911e+00	-5.65109862e-04	-5.
	06042647e-01			
292	8.01946356e-01	-6.36379081e+00	1.05918406e+01	1.
	26270817e+01			
293	-3.56027363e-05	1.01932735e-01	-6.54624435e-01	8.
	72688245e-01			
294	-6.73204577e-01	-1.06734550e+01	-7.26716167e+00	-1.
	88589511e+01			
295	1.32201462e+00	-3.44718225e-01	-9.80618527e+00	-9.
	59798341e+00			
296	-8.63135845e-01	-4.26825120e+00	7.29559381e+00	1.
	37669601e+00			
297	-3.60859717e-01	-1.73732694e+00	-1.97221105e+00]	
298	norm absolute difference alpha:	0.019353188881843855		

```
299 norm absolute difference beta: 0.3437346066432947
300 LogLikelihood value: 11608.130801852312
301 Difference LogLikelihood value: -0.2976845305402094
302 E-step duration: 0:00:03
303 function value: 11642.022340738044 at iteration 1000
304 function value: 11642.003305513592 at iteration 2000
305 function value: 11641.994414981744 at iteration 3000
306 Optimization terminated successfully.
307 Current function value: 11641.991260
308 Iterations: 3090
309 Function evaluations: 3584
310
311 10 largest Differences in logl according to simplex
before termination:
312 [0.00160471 0.00161051 0.00161628 0.00162482 0.00162837 0
.00163038
313 0.00163083 0.0016315 0.00163165 0.00163769]
314
315 10 largest Differences in logl according to simplex at
termination:
316 [0.002158 0.0021638 0.00216957 0.00217811 0.00218167 0
.00218367
317 0.00218412 0.00218479 0.00218495 0.00219098]
318
319 10 largest Differences in x according to simplex before
termination:
320 [0.07110903 0.07163159 0.074719 0.07537306 0.07875681 0
.07893267
321 0.07934501 0.08549233 0.10440073 0.10861148]
322
323 10 largest Differences in x according to simplex at
termination:
324 [0.06696227 0.07582324 0.07717379 0.08188256 0.08241327 0
.08291718
325 0.08738732 0.08996655 0.09696205 0.09723672]
326 Finished iteration 3, duration M step 0:01:41
327 [ 3.28158415e-03 -2.31758707e-02 -9.42355678e-01 -8.
04857780e-05
328 -4.30115833e-01 1.86528871e-03 -1.15701343e-15 -4.
08361641e+00
329 1.45243691e+00 -2.97545053e-04 3.72634841e-03 -2.
16145237e-04
330 -8.69928553e-04 -1.63035782e+00 -8.46152600e-04 -1.
09268849e-01
331 -2.25494761e-03 -1.69273139e-04 1.12199112e-08 2.
59786594e+00
```

332	5.73367691e-03	-8.83533240e-07	-1.14154271e-03	2.
	74488076e+01			
333	-3.06954420e-03	2.33704818e+01	1.05447137e-10	6.
	48760439e+00			
334	-1.21452266e+00	3.90533646e-01	1.94189556e-03	3.
	28598502e+00			
335	2.20980888e-13	1.53476933e+00	-3.61586460e+00	7.
	72169137e-02			
336	-2.79269332e+00	-2.73359658e-03	-7.90771317e-01	4.
	07250930e-02			
337	-2.48788140e-08	2.17748015e+00	-2.36103679e-02	1.
	13772608e-05			
338	-2.26429314e+00	1.46694981e-03	4.18462857e+00	-1.
	25984418e-06			
339	7.34865977e-05	1.73158158e+01	-1.22527384e-05	-8.
	77738419e-13			
340	1.04386698e+01	-6.99832058e-01	1.51099914e+01	-1.
	24578587e+00			
341	2.54628877e-01	-1.33686053e-08	7.98612165e-01	-4.
	24999987e-04			
342	1.45960326e-03	-1.31634273e+00	1.76181979e+00	-1.
	47793063e-03			
343	-3.11225605e-02	1.39611751e-03	-6.71778637e-03	1.
	77985962e-05			
344	1.45683396e+00	1.73491005e-03	3.05006466e-03	-1.
	21696184e-05			
345	7.22976395e-04	3.31705539e+00	1.72592268e-02	-3.
	91289949e-03			
346	-5.51901821e-10	-3.78902280e-10	-1.26166876e+01	-5.
	07706361e-11			
347	-1.60665717e+01	-6.25969966e-04	-1.63548632e-05	-1.
	16149490e+00			
348	9.83938198e-03	-2.14029951e-04	-3.74454943e-04	4.
	57604912e-04			
349	-1.40722321e-02	2.60617208e+00	3.57785300e+00	9.
	67026091e+00			
350	-8.59921919e-03	1.57673204e-03	1.22533962e+00	1.
	28468724e-05			
351	-1.40558731e-07	5.93570934e-07	-7.87441869e-04	5.
	10103263e-02			
352	1.74181610e-04	1.02276511e-04	-5.51489391e-03	1.
	44001813e+00			
353	1.25016843e-02	1.08387099e-02	8.37359319e-07	1.
	14068551e-07			
354	-3.15515304e-06	1.28419706e-05	1.72857947e-03	-2.
	29859604e-03			

355	4.67398327e-04	-1.61961386e-03	5.09842625e-03	1.
	27669830e-03			
356	-8.22133251e-04	2.21014248e-03	-1.46189736e-03	1.
	87509715e+00			
357	-5.06585480e-02	1.95425296e-02	-8.73150215e-10	7.
	76975359e-04			
358	2.06342609e-04	-2.10604450e-07	-2.36938224e-08	-4.
	28750251e-11			
359	-7.62521829e-05	-1.03893511e-02	-1.54645954e-08	2.
	42808332e-06			
360	-1.93706666e-06	6.43632262e-06	5.20648700e-07	3.
	55946900e-07			
361	5.39807133e-02	-1.74842942e-02	-3.01884305e-05	5.
	01521068e-06			
362	1.60253726e+01	1.72514031e+01	3.70889571e-01	1.
	41389092e+01			
363	1.35391421e+01	2.04013521e+00	8.52615763e-08	1.
	27434976e-04			
364	-2.46604457e-05	1.36542776e-06	6.38200430e-01	3.
	88244648e-01			
365	-3.07924490e-04	-5.67535539e-05	-3.95851558e-04	3.
	13679040e-04			
366	-7.25334321e-02	-1.43734377e-06	-2.20363106e-04	-5.
	15080868e-03			
367	8.08799555e-02	2.22789858e-04	4.77558463e-05	3.
	94902463e-04			
368	1.74478921e-04	-9.12508371e-06	3.27376124e-05	-3.
	48062082e-11			
369	-1.27859764e+01	-2.12081102e-11	1.01779480e-06	9.
	59225076e+00			
370	8.42210600e+00	-7.21224381e+00	-5.64702400e-04	-5.
	03553129e-01			
371	7.99121085e-01	-6.37233135e+00	1.05916317e+01	1.
	26264147e+01			
372	-3.57722398e-05	1.02791744e-01	-6.54832586e-01	8.
	73543254e-01			
373	-6.72625873e-01	-1.06629581e+01	-7.24942227e+00	-1.
	88785793e+01			
374	1.32249858e+00	-3.44800755e-01	-9.82124494e+00	-9.
	60272735e+00			
375	-8.63162803e-01	-4.26837421e+00	7.29640568e+00	1.
	37601171e+00			
376	-3.60738265e-01	-1.73715600e+00	-1.97287994e+00]	
377	norm absolute difference alpha:	0.013451387109931098		
378	norm absolute difference beta:	0.3409430003473994		
379	LogLikelihood value:	11607.834973723959		

```
380 Difference LogLikelihood value: -0.2958281283536053
381 E-step duration: 0:00:03
382 function value: 11641.975893831095 at iteration 1000
383 function value: 11641.962619083619 at iteration 2000
384 function value: 11641.955167108643 at iteration 3000
385 function value: 11641.951073044553 at iteration 4000
386 function value: 11641.945735982374 at iteration 5000
387 function value: 11641.941428340697 at iteration 6000
388 function value: 11641.937039329552 at iteration 7000
389 function value: 11641.932093157468 at iteration 8000
390 function value: 11641.927008374785 at iteration 9000
391 Optimization terminated successfully.
392         Current function value: 11641.921360
393         Iterations: 9384
394         Function evaluations: 9971
395
396 10 largest Differences in logl according to simplex
before termination:
397 [0.00146358 0.0014751 0.00148073 0.00148306 0.00148903 0
.00148919
398 0.00149202 0.00149586 0.00149881 0.00150617]
399
400 10 largest Differences in logl according to simplex at
termination:
401 [0.0020614 0.00207292 0.00207856 0.00208088 0.00208686 0
.00208701
402 0.00208984 0.00209368 0.00209663 0.00210399]
403
404 10 largest Differences in x according to simplex before
termination:
405 [0.06326934 0.07135457 0.0728165 0.07327691 0.08395639 0
.08776327
406 0.09612309 0.10187948 0.13389537 0.13897167]
407
408 10 largest Differences in x according to simplex at
termination:
409 [0.06289847 0.06497527 0.06707896 0.06910025 0.0824964 0
.08513202
410 0.09034132 0.09557129 0.09921991 0.09975252]
411 Finished iteration 4, duration M step 0:04:37
412 [ 3.26718366e-03 -2.28864228e-02 -9.38087212e-01 -8.
71349135e-05
413 -5.33839054e-01 1.88619220e-03 -1.11901507e-15 -4.
07795670e+00
414 1.39966403e+00 -3.08645830e-04 3.74175076e-03 -2.
13169891e-04
```

415	-8.48066389e-04	-1.98619873e+00	-9.07309405e-04	-1.
	08465278e-01			
416	-2.32522550e-03	-1.61808641e-04	1.01932185e-08	2.
	64476216e+00			
417	5.68212766e-03	-8.32166640e-07	-1.05905628e-03	2.
	76354090e+01			
418	-3.12167105e-03	2.35280969e+01	1.16212904e-10	6.
	44197570e+00			
419	-1.21986839e+00	3.90956510e-01	1.99066049e-03	3.
	29704668e+00			
420	2.10978122e-13	1.53970988e+00	-3.62048381e+00	8.
	17683110e-02			
421	-2.80444233e+00	-2.53876171e-03	-7.83012653e-01	3.
	88668386e-02			
422	-2.45402193e-08	2.21270007e+00	-1.91496643e-02	1.
	19942963e-05			
423	-2.33778415e+00	1.40769849e-03	4.33633545e+00	-1.
	39699793e-06			
424	7.37504424e-05	1.72991078e+01	-9.37537633e-06	-8.
	25197188e-13			
425	1.03381788e+01	-6.47320206e-01	1.50824091e+01	-1.
	24835517e+00			
426	2.54052776e-01	-1.32646992e-08	8.13719187e-01	-3.
	95187523e-04			
427	1.49075557e-03	-1.37474099e+00	1.80473313e+00	-1.
	48067259e-03			
428	-3.54993874e-02	1.38205024e-03	-6.37565729e-03	1.
	59392310e-05			
429	1.47566409e+00	1.71784025e-03	3.18208153e-03	-1.
	24353717e-05			
430	8.13850901e-04	3.45160123e+00	1.77091464e-02	-2.
	98279301e-03			
431	-5.27912244e-10	-3.56321495e-10	-1.24917738e+01	-5.
	07273761e-11			
432	-1.60786500e+01	-6.30655555e-04	-1.84919862e-05	-1.
	29772820e+00			
433	9.39436068e-03	-2.17333216e-04	-3.98964920e-04	4.
	43380063e-04			
434	-1.40581712e-02	2.58434009e+00	3.72368004e+00	9.
	79883516e+00			
435	-8.77272587e-03	1.63495146e-03	1.28439065e+00	1.
	14830701e-05			
436	-1.32839073e-07	5.64262001e-07	-8.11626242e-04	5.
	22400978e-02			
437	2.08788217e-04	9.09259612e-05	-5.55603539e-03	1.
	52649002e+00			

438	1.24677242e-02	1.08213782e-02	7.27775945e-07	1.
	16756048e-07			
439	-3.08178207e-06	1.23938421e-05	1.80639042e-03	-2.
	27853963e-03			
440	4.69334944e-04	-1.64772378e-03	5.26485177e-03	1.
	26829980e-03			
441	-8.21099494e-04	2.28621233e-03	-1.46437031e-03	1.
	88297269e+00			
442	-4.85920048e-02	1.94452489e-02	-8.43403511e-10	7.
	71375043e-04			
443	2.04389593e-04	-2.00254729e-07	-2.30431069e-08	-4.
	09603195e-11			
444	-7.43268718e-05	-1.05508544e-02	-1.65626959e-08	2.
	76668945e-06			
445	-1.91663200e-06	6.40058739e-06	5.24938203e-07	3.
	49307093e-07			
446	5.36776363e-02	-1.77654361e-02	-3.00496784e-05	4.
	98380763e-06			
447	1.60055075e+01	1.72795659e+01	3.60773355e-01	1.
	42213539e+01			
448	1.35775309e+01	2.01644854e+00	8.08660241e-08	1.
	28025194e-04			
449	-2.87750153e-05	1.28947234e-06	7.15538030e-01	3.
	81923642e-01			
450	-3.07135892e-04	-5.40962445e-05	-3.46995491e-04	2.
	66769503e-04			
451	-7.08173489e-02	-1.73690108e-06	-2.15923695e-04	-5.
	22867861e-03			
452	8.04541829e-02	2.48518794e-04	4.76758909e-05	3.
	78998558e-04			
453	1.38044220e-04	-7.03255869e-06	3.50981622e-05	-3.
	21729282e-11			
454	-1.27194432e+01	-2.29728668e-11	1.04918152e-06	9.
	60455279e+00			
455	8.43475085e+00	-7.31947540e+00	-5.86449977e-04	-4.
	97837941e-01			
456	7.89692920e-01	-6.48360814e+00	1.05919401e+01	1.
	26264162e+01			
457	-3.62978981e-05	1.08955689e-01	-6.56545871e-01	8.
	75088813e-01			
458	-6.73599331e-01	-1.07426758e+01	-7.38129410e+00	-1.
	87805873e+01			
459	1.32628008e+00	-3.45536164e-01	-9.76192319e+00	-9.
	52091061e+00			
460	-8.63221595e-01	-4.26698437e+00	7.29558584e+00	1.
	37145385e+00			

```
461 -3.60088398e-01 -1.73784138e+00 -1.97159836e+00]
462 norm absolute difference alpha: 0.009833409190311265
463 norm absolute difference beta: 0.36481411353248555
464 LogLikelihood value: 11607.466225013704
465 Difference LogLikelihood value: -0.36874871025429456
466 E-step duration: 0:00:03
467 function value: 11641.584236103292 at iteration 1000
468 function value: 11641.576268823643 at iteration 2000
469 function value: 11641.568766064594 at iteration 3000
470 function value: 11641.565667106743 at iteration 4000
471 function value: 11641.561946816542 at iteration 5000
472 function value: 11641.559378891361 at iteration 6000
473 Optimization terminated successfully.
474 Current function value: 11641.557478
475 Iterations: 5560
476 Function evaluations: 6157
477
478 10 largest Differences in logl according to simplex
before termination:
479 [0.00125313 0.00125423 0.00125528 0.00126007 0.00126372 0
.00126517
480 0.00126558 0.00126686 0.00126878 0.00127036]
481
482 10 largest Differences in logl according to simplex at
termination:
483 [0.00139572 0.00139682 0.00139787 0.00140266 0.00140631 0
.00140776
484 0.00140817 0.00140945 0.00141136 0.00141295]
485
486 10 largest Differences in x according to simplex before
termination:
487 [0.06869645 0.07052764 0.07158253 0.07584374 0.07719361 0
.07760568
488 0.07964586 0.0861369 0.09604892 0.10244275]
489
490 10 largest Differences in x according to simplex at
termination:
491 [0.06455071 0.06717884 0.06825276 0.07364636 0.07910224 0
.08081124
492 0.08611068 0.08723629 0.09007587 0.09374179]
493 Finished iteration 5, duration M step 0:02:52
494 [ 3.25576887e-03 -2.26801991e-02 -9.36161169e-01 -8.
82995666e-05
495 -5.45579746e-01 1.91759046e-03 -1.10700783e-15 -4.
09903100e+00
496 1.37212063e+00 -3.09855741e-04 3.93939260e-03 -2.
```

496	15385264e-04				
497	-8.65473615e-04	-2.04688052e+00	-7.89573249e-04	-1.	
	05853555e-01				
498	-2.33058438e-03	-1.63042280e-04	1.01102691e-08	2.	
	66063983e+00				
499	5.67452160e-03	-8.28857569e-07	-1.02204504e-03	2.	
	76121055e+01				
500	-3.08033046e-03	2.36125689e+01	1.14686515e-10	6.	
	44128787e+00				
501	-1.22032522e+00	3.92981256e-01	1.96468721e-03	3.	
	29983928e+00				
502	2.09565614e-13	1.50920045e+00	-3.63749760e+00	8.	
	19037872e-02				
503	-2.80769779e+00	-2.00497295e-03	-7.92851945e-01	3.	
	86702835e-02				
504	-2.43279818e-08	2.22262902e+00	-1.91103993e-02	1.	
	21105288e-05				
505	-2.32458623e+00	1.36554113e-03	4.31669002e+00	-1.	
	41083415e-06				
506	7.52053795e-05	1.73369722e+01	-9.30738235e-06	-8.	
	21903908e-13				
507	1.03143960e+01	-6.38278958e-01	1.50601632e+01	-1.	
	24950529e+00				
508	2.53951297e-01	-1.32333522e-08	7.91640530e-01	-3.	
	98858755e-04				
509	1.50613526e-03	-1.38255163e+00	1.78069023e+00	-1.	
	49488803e-03				
510	-3.47507496e-02	1.41358142e-03	-6.36919276e-03	1.	
	61756254e-05				
511	1.53505619e+00	1.73885559e-03	3.12991201e-03	-1.	
	23624226e-05				
512	8.19519762e-04	3.48700010e+00	1.73237827e-02	-2.	
	98715023e-03				
513	-5.26295689e-10	-3.53626372e-10	-1.25647435e+01	-5.	
	06750763e-11				
514	-1.60315183e+01	-6.07914222e-04	-1.89085015e-05	-1.	
	48250839e+00				
515	9.36531044e-03	-2.17744956e-04	-3.90892902e-04	4.	
	45697232e-04				
516	-1.34537605e-02	2.66053170e+00	3.76385993e+00	9.	
	82864058e+00				
517	-8.78439258e-03	1.63554659e-03	1.33120112e+00	1.	
	14492458e-05				
518	-1.32026795e-07	5.69089429e-07	-7.67728928e-04	5.	
	30075572e-02				
519	2.12861444e-04	9.27152759e-05	-5.54714446e-03	1.	

519	59059052e+00				
520	1.30189706e-02	1.07650881e-02	7.24504130e-07	1.	
	15451676e-07				
521	-3.09262335e-06	1.26405846e-05	1.80197325e-03	-2.	
	29894354e-03				
522	4.31942151e-04	-1.77510051e-03	5.20819809e-03	1.	
	33401173e-03				
523	-8.52820345e-04	2.22348883e-03	-1.48771280e-03	1.	
	88083900e+00				
524	-4.90216950e-02	1.94228121e-02	-8.38003439e-10	7.	
	89562036e-04				
525	2.05854632e-04	-1.92026055e-07	-2.29584401e-08	-4.	
	07084613e-11				
526	-7.43357991e-05	-1.05574900e-02	-1.64378343e-08	2.	
	79090276e-06				
527	-1.89333508e-06	6.35440174e-06	5.21878765e-07	3.	
	46800894e-07				
528	5.34142832e-02	-1.78888050e-02	-3.03159212e-05	5.	
	02314317e-06				
529	1.60681700e+01	1.73241632e+01	3.51843693e-01	1.	
	42615899e+01				
530	1.36111731e+01	2.01207806e+00	8.04315148e-08	1.	
	28272215e-04				
531	-2.90501013e-05	1.24614243e-06	7.10559340e-01	3.	
	82236246e-01				
532	-3.19198886e-04	-5.40233886e-05	-3.58403438e-04	2.	
	64875049e-04				
533	-7.03653268e-02	-1.74175191e-06	-2.16422498e-04	-5.	
	60165773e-03				
534	7.94467757e-02	2.47898120e-04	4.79153063e-05	3.	
	78425994e-04				
535	1.40160594e-04	-6.97059281e-06	3.53158833e-05	-3.	
	19760776e-11				
536	-1.27798298e+01	-2.28476344e-11	1.05501408e-06	9.	
	61151178e+00				
537	8.42731570e+00	-7.22640411e+00	-5.86112551e-04	-4.	
	98587351e-01				
538	7.90866168e-01	-6.36516874e+00	1.05906513e+01	1.	
	26255611e+01				
539	-3.65180097e-05	1.11409671e-01	-6.56237826e-01	8.	
	74754889e-01				
540	-6.72513215e-01	-1.07245319e+01	-7.29628485e+00	-1.	
	88768628e+01				
541	1.32778326e+00	-3.45509501e-01	-9.91743976e+00	-9.	
	62030403e+00				
542	-8.63486839e-01	-4.26721792e+00	7.29644904e+00	1.	

```
542 36955737e+00
543 -3.59975917e-01 -1.73759139e+00 -1.97214255e+00]
544 norm absolute difference alpha: 0.019471952165143674
545 norm absolute difference beta: 0.7038928714928371
546 LogLikelihood value: 11607.212869401847
547 Difference LogLikelihood value: -0.2533556118578417
548 E-step duration: 0:00:03
549 function value: 11641.4019616717 at iteration 1000
550 function value: 11641.378801662966 at iteration 2000
551 function value: 11641.375207123141 at iteration 3000
552 function value: 11641.37307149852 at iteration 4000
553 Optimization terminated successfully.
554         Current function value: 11641.370532
555         Iterations: 3919
556         Function evaluations: 4512
557
558 10 largest Differences in logl according to simplex
before termination:
559 [0.00098755 0.00098964 0.00099031 0.00099174 0.00099184 0
.00100757
560 0.00100878 0.00101026 0.00101264 0.00101425]
561
562 10 largest Differences in logl according to simplex at
termination:
563 [0.0011033 0.00110538 0.00110605 0.00110748 0.00110758 0
.00112331
564 0.00112452 0.001126 0.00112838 0.00112999]
565
566 10 largest Differences in x according to simplex before
termination:
567 [0.06987156 0.07080009 0.07203351 0.07488613 0.07963563 0
.08422499
568 0.08625773 0.08751054 0.10007426 0.10248589]
569
570 10 largest Differences in x according to simplex at
termination:
571 [0.07045957 0.0730883 0.07542539 0.07609527 0.07652592 0
.08582922
572 0.08772994 0.09094742 0.09697162 0.09841106]
573 Finished iteration 6, duration M step 0:02:06
574 [ 3.24500884e-03 -2.26411986e-02 -9.32220449e-01 -8.
82106960e-05
575 -5.59021377e-01 1.91406982e-03 -1.10553283e-15 -4.
12229148e+00
576 1.31038858e+00 -3.10468047e-04 3.91794732e-03 -2.
15132853e-04
```

577	-8.59760836e-04	-2.08299859e+00	-7.87148831e-04	-1. 04653852e-01
578	-2.31913484e-03	-1.63079106e-04	1.00970787e-08	2. 68634397e+00
579	5.92474760e-03	-8.31338737e-07	-1.01980973e-03	2. 76542021e+01
580	-3.06028816e-03	2.36638312e+01	1.14812792e-10	6. 44365116e+00
581	-1.22180150e+00	3.93716173e-01	1.95884178e-03	3. 30539455e+00
582	2.09641320e-13	1.52104207e+00	-3.64487196e+00	8. 09888713e-02
583	-2.80145892e+00	-1.99636833e-03	-7.96483237e-01	3. 84235457e-02
584	-2.42012316e-08	2.22854066e+00	-1.90360972e-02	1. 21218824e-05
585	-2.33184710e+00	1.36041877e-03	4.31691609e+00	-1. 41154762e-06
586	7.48995714e-05	1.73218524e+01	-9.63587165e-06	-8. 22289812e-13
587	1.02806031e+01	-6.28498598e-01	1.50700800e+01	-1. 24948060e+00
588	2.54436819e-01	-1.31506266e-08	7.89704108e-01	-3. 99213514e-04
589	1.49973456e-03	-1.38231537e+00	1.77255003e+00	-1. 48934731e-03
590	-3.46179039e-02	1.40744125e-03	-6.33169657e-03	1. 61934449e-05
591	1.54422678e+00	1.73734128e-03	3.10537579e-03	-1. 21236697e-05
592	8.25579391e-04	3.49247579e+00	1.72762519e-02	-3. 24357023e-03
593	-5.25599742e-10	-3.52974465e-10	-1.25900429e+01	-5. 06031384e-11
594	-1.60266981e+01	-6.06135254e-04	-1.89126433e-05	-1. 62355439e+00
595	9.32067359e-03	-2.17305785e-04	-3.92407205e-04	4. 38720115e-04
596	-1.34327667e-02	2.71088035e+00	3.77140278e+00	9. 81916888e+00
597	-8.74250098e-03	1.61814864e-03	1.36333088e+00	1. 14827130e-05
598	-1.31895468e-07	5.64073979e-07	-7.63283817e-04	5. 36720967e-02
599	2.13811536e-04	9.26632763e-05	-5.51410419e-03	1. 63610569e+00

600	1.29446341e-02	1.06545732e-02	7.28528202e-07	1.
	14364801e-07			
601	-3.05842653e-06	1.26532984e-05	1.79927871e-03	-2.
	29062781e-03			
602	4.30449860e-04	-1.76838963e-03	5.17779790e-03	1.
	33235806e-03			
603	-8.48323024e-04	2.21073806e-03	-1.48411395e-03	1.
	86661314e+00			
604	-4.97093147e-02	1.92789784e-02	-8.38223383e-10	7.
	85074200e-04			
605	2.05066997e-04	-1.93224918e-07	-2.29783406e-08	-4.
	07202855e-11			
606	-7.47748885e-05	-1.04927569e-02	-1.62781361e-08	2.
	70130649e-06			
607	-1.90133214e-06	6.56544361e-06	5.14973782e-07	3.
	43491144e-07			
608	5.28257558e-02	-1.77747584e-02	-3.12386291e-05	5.
	03004855e-06			
609	1.61379812e+01	1.73590905e+01	3.42994717e-01	1.
	43132130e+01			
610	1.36677909e+01	2.00928788e+00	8.02984305e-08	1.
	28645490e-04			
611	-2.79229929e-05	1.24525943e-06	7.02898593e-01	3.
	78945435e-01			
612	-3.17124325e-04	-5.40296402e-05	-3.57128619e-04	2.
	66336367e-04			
613	-6.96748863e-02	-1.72321590e-06	-2.16021342e-04	-5.
	57263373e-03			
614	7.90198354e-02	2.47969626e-04	4.76640737e-05	3.
	80733547e-04			
615	1.40670936e-04	-6.97803372e-06	3.52007916e-05	-3.
	19918043e-11			
616	-1.27956901e+01	-2.27887571e-11	1.04074608e-06	9.
	61280131e+00			
617	8.42647842e+00	-7.25641784e+00	-5.81055964e-04	-4.
	96613145e-01			
618	7.87716476e-01	-6.40227871e+00	1.05904955e+01	1.
	26255702e+01			
619	-3.96219991e-05	1.12256674e-01	-6.56594664e-01	8.
	75374548e-01			
620	-6.71792388e-01	-1.07003882e+01	-7.31036328e+00	-1.
	88595558e+01			
621	1.32962063e+00	-3.45687247e-01	-9.81551872e+00	-9.
	60563504e+00			
622	-8.63399672e-01	-4.26692629e+00	7.29585117e+00	1.
	36863827e+00			

```
623 -3.60111033e-01 -1.73768899e+00 -1.97257795e+00]
624 norm absolute difference alpha: 0.007956950758383863
625 norm absolute difference beta: 0.4552341594799373
626 LogLikelihood value: 11607.024077091755
627 Difference LogLikelihood value: -0.18879231009123032
628 E-step duration: 0:00:03
629 function value: 11641.376175727362 at iteration 1000
630 function value: 11641.369340208781 at iteration 2000
631 function value: 11641.36416210012 at iteration 3000
632 function value: 11641.358880559446 at iteration 4000
633 Optimization terminated successfully.
634         Current function value: 11641.354927
635         Iterations: 4164
636         Function evaluations: 4709
637
638 10 largest Differences in logl according to simplex
before termination:
639 [0.00158886 0.00159405 0.00159793 0.00160934 0.00161693 0
.00161749
640 0.00162385 0.00162414 0.00162843 0.00163347]
641
642 10 largest Differences in logl according to simplex at
termination:
643 [0.00171271 0.0017179 0.00172178 0.00173319 0.00174077 0
.00174134
644 0.0017477 0.00174799 0.00175228 0.00175732]
645
646 10 largest Differences in x according to simplex before
termination:
647 [0.06966352 0.07574702 0.0774554 0.08101355 0.08126279 0
.08383093
648 0.08789091 0.08875672 0.10290239 0.10308678]
649
650 10 largest Differences in x according to simplex at
termination:
651 [0.07281919 0.07831604 0.07865983 0.08055132 0.08439761 0
.08624353
652 0.09147576 0.09714055 0.09846937 0.09921174]
653 Finished iteration 7, duration M step 0:02:12
654 [ 3.25112292e-03 -2.26228436e-02 -9.29536035e-01 -8.
69379418e-05
655 -5.80872932e-01 1.93695100e-03 -1.10042909e-15 -4.
15098358e+00
656 1.27943113e+00 -3.17063039e-04 4.03997525e-03 -2.
14019036e-04
657 -8.55564305e-04 -2.14330800e+00 -7.82589029e-04 -1.
```

657	02728373e-01				
658	-2.30759861e-03	-1.65418861e-04	1.01062885e-08	2.	
	70251783e+00				
659	6.00305057e-03	-8.33895615e-07	-9.64877849e-04	2.	
	76615366e+01				
660	-3.04959118e-03	2.36780554e+01	1.14454242e-10	6.	
	44174172e+00				
661	-1.22229005e+00	3.92671948e-01	1.95530528e-03	3.	
	30677723e+00				
662	2.19492650e-13	1.52484651e+00	-3.64249920e+00	8.	
	25616545e-02				
663	-2.81165635e+00	-1.97299004e-03	-8.01910420e-01	3.	
	67626071e-02				
664	-2.42318545e-08	2.23390573e+00	-1.88663783e-02	1.	
	20466433e-05				
665	-2.32778453e+00	1.36410117e-03	4.32354402e+00	-1.	
	44018971e-06				
666	7.42164807e-05	1.73394071e+01	-9.57487588e-06	-8.	
	16309945e-13				
667	1.02345352e+01	-6.22619804e-01	1.50598852e+01	-1.	
	25082179e+00				
668	2.54365904e-01	-1.32033318e-08	7.77549716e-01	-3.	
	96089050e-04				
669	1.48704943e-03	-1.37796284e+00	1.74016591e+00	-1.	
	46954959e-03				
670	-3.42593195e-02	1.39685180e-03	-6.33576734e-03	1.	
	60445349e-05				
671	1.56709981e+00	1.72057267e-03	3.08174554e-03	-1.	
	21353786e-05				
672	8.21625079e-04	3.50502986e+00	1.70983667e-02	-3.	
	25681883e-03				
673	-5.26739145e-10	-3.53357394e-10	-1.25880352e+01	-5.	
	07051776e-11				
674	-1.60194367e+01	-6.06259347e-04	-1.88614772e-05	-1.	
	70512552e+00				
675	9.35462599e-03	-2.18321359e-04	-3.89883721e-04	4.	
	18771819e-04				
676	-1.34782031e-02	2.80975540e+00	3.80727075e+00	9.	
	82605397e+00				
677	-8.75772500e-03	1.62436615e-03	1.40590739e+00	1.	
	14709168e-05				
678	-1.32619159e-07	5.95434336e-07	-7.63109663e-04	5.	
	93768932e-02				
679	2.14570839e-04	9.18659738e-05	-5.53434699e-03	1.	
	70324686e+00				
680	1.30238065e-02	1.06342839e-02	7.29810746e-07	1.	

680	14188729e-07			
681	-3.05728592e-06	1.25772278e-05	1.81760189e-03	-2.
	29792328e-03			
682	4.28226141e-04	-1.77501134e-03	5.18685683e-03	1.
	32270068e-03			
683	-8.53057530e-04	2.19945792e-03	-1.47196021e-03	1.
	87273377e+00			
684	-4.82104743e-02	1.91818011e-02	-8.39780141e-10	7.
	78134029e-04			
685	2.03863563e-04	-1.93744080e-07	-2.30368192e-08	-4.
	07630219e-11			
686	-7.39550443e-05	-1.05986052e-02	-1.62741364e-08	2.
	69666174e-06			
687	-1.89336083e-06	6.55654785e-06	5.15770077e-07	3.
	43665783e-07			
688	5.19515654e-02	-1.79034099e-02	-3.11757122e-05	4.
	85719268e-06			
689	1.61557229e+01	1.74028968e+01	3.33811419e-01	1.
	43398488e+01			
690	1.37081857e+01	2.01225220e+00	8.04567489e-08	1.
	27447258e-04			
691	-2.79280731e-05	1.24842951e-06	6.96300155e-01	3.
	84287026e-01			
692	-3.32758548e-04	-5.36445442e-05	-3.53709154e-04	2.
	67203082e-04			
693	-6.90294782e-02	-1.72187818e-06	-2.13682204e-04	-5.
	57872806e-03			
694	7.80834365e-02	2.45566136e-04	4.72766016e-05	3.
	79522328e-04			
695	1.38969419e-04	-6.94560312e-06	3.48403835e-05	-3.
	20396704e-11			
696	-1.28347328e+01	-2.28104547e-11	1.03865796e-06	9.
	60818069e+00			
697	8.42346995e+00	-7.23749627e+00	-5.89983376e-04	-4.
	96605649e-01			
698	7.83900324e-01	-6.40303517e+00	1.05897851e+01	1.
	26253056e+01			
699	-3.77447045e-05	1.15063832e-01	-6.57296923e-01	8.
	76049537e-01			
700	-6.70111252e-01	-1.07123098e+01	-7.28280730e+00	-1.
	88634417e+01			
701	1.33138599e+00	-3.45638695e-01	-9.81871633e+00	-9.
	58395042e+00			
702	-8.62948594e-01	-4.26650436e+00	7.29623864e+00	1.
	36648442e+00			
703	-3.60046341e-01	-1.73764304e+00	-1.97259190e+00]	

```
704 norm absolute difference alpha: 0.00960617578412274
705 norm absolute difference beta: 0.31386389857794444
706 LogLikelihood value: 11606.863990483766
707 Difference LogLikelihood value: -0.1600866079897969
708 E-step duration: 0:00:03
709 function value: 11641.326824804659 at iteration 1000
710 function value: 11641.31856582035 at iteration 2000
711 function value: 11641.311851730901 at iteration 3000
712 function value: 11641.307088469057 at iteration 4000
713 function value: 11641.299730830844 at iteration 5000
714 function value: 11641.295031667158 at iteration 6000
715 function value: 11641.289067983329 at iteration 7000
716 Optimization terminated successfully.
717     Current function value: 11641.284751
718     Iterations: 6971
719     Function evaluations: 7542
720
721 10 largest Differences in logl according to simplex
before termination:
722 [0.00149309 0.00149543 0.00149564 0.00149741 0.00150017 0
.00150627
723 0.00150648 0.00152089 0.00152145 0.00152442]
724
725 10 largest Differences in logl according to simplex at
termination:
726 [0.0021834 0.00218574 0.00218594 0.00218772 0.00219048 0
.00219658
727 0.00219678 0.0022112 0.00221175 0.00221473]
728
729 10 largest Differences in x according to simplex before
termination:
730 [0.07434538 0.07941847 0.08022199 0.08071518 0.08307237 0
.084699
731 0.09254645 0.09381126 0.09384121 0.10744583]
732
733 10 largest Differences in x according to simplex at
termination:
734 [0.06829792 0.07727802 0.07829168 0.07891651 0.08225805 0
.08600792
735 0.08636036 0.08919444 0.09036878 0.09624415]
736 Finished iteration 8, duration M step 0:03:30
737 [ 3.17241237e-03 -2.27928750e-02 -9.21347515e-01 -7.
65719287e-05
738 -6.56736578e-01 1.88447190e-03 -1.08012896e-15 -4.
20512036e+00
739 1.22562936e+00 -3.15036254e-04 3.95338511e-03 -2.
```

739	12615632e-04				
740	-8.76521818e-04	-2.24837723e+00	-8.73394352e-04	-1.	
	01142400e-01				
741	-2.23594874e-03	-1.64581984e-04	9.94831160e-09	2.	
	63735490e+00				
742	5.99681071e-03	-8.42237906e-07	-9.32200298e-04	2.	
	77685099e+01				
743	-2.94409373e-03	2.37557721e+01	1.11248047e-10	6.	
	43739984e+00				
744	-1.22097104e+00	3.93691159e-01	1.89529184e-03	3.	
	33587362e+00				
745	2.14193927e-13	1.53614857e+00	-3.68519470e+00	8.	
	48120175e-02				
746	-2.82403949e+00	-1.86494046e-03	-8.16364947e-01	3.	
	53931151e-02				
747	-2.87388939e-08	2.24405098e+00	-1.86518419e-02	1.	
	20651274e-05				
748	-2.35022919e+00	1.33512951e-03	4.36060468e+00	-1.	
	31731473e-06				
749	7.58962646e-05	1.72957629e+01	-9.74417266e-06	-7.	
	99048866e-13				
750	1.01377338e+01	-6.26388606e-01	1.50890471e+01	-1.	
	25039238e+00				
751	2.49620847e-01	-1.27882934e-08	7.60260311e-01	-3.	
	97446457e-04				
752	1.48473525e-03	-1.43074829e+00	1.73837100e+00	-1.	
	50388814e-03				
753	-3.28858700e-02	1.43219422e-03	-6.10978068e-03	1.	
	95914240e-05				
754	1.60475660e+00	1.89791890e-03	2.97294092e-03	-1.	
	01111967e-05				
755	8.17381266e-04	3.54709960e+00	1.70612102e-02	-3.	
	18859822e-03				
756	-5.28430065e-10	-3.31064830e-10	-1.25771563e+01	-4.	
	99438529e-11				
757	-1.60067765e+01	-6.06645359e-04	-1.83518314e-05	-1.	
	84294230e+00				
758	9.21705180e-03	-2.17431830e-04	-3.79025457e-04	4.	
	17509871e-04				
759	-1.46509512e-02	2.94529238e+00	3.97561179e+00	9.	
	91055148e+00				
760	-8.61282609e-03	1.62891527e-03	1.44009493e+00	1.	
	12451996e-05				
761	-1.29684226e-07	5.95360699e-07	-7.48103727e-04	6.	
	76305165e-02				
762	2.10787371e-04	7.20180555e-05	-5.56564238e-03	1.	

762	90683043e+00					
763	1.37451423e-02	1.03227833e-02	7.61512984e-07	1.		
	13403039e-07					
764	-2.99991243e-06	1.25153782e-05	1.69650744e-03	-2.		
	34800473e-03					
765	4.17895613e-04	-1.75028732e-03	5.10008902e-03	1.		
	29377740e-03					
766	-1.09231269e-03	2.26378512e-03	-1.45701223e-03	1.		
	89635900e+00					
767	-5.30762858e-02	1.79766863e-02	-8.23921182e-10	7.		
	57652581e-04					
768	1.83065511e-04	-1.94998975e-07	-2.25866770e-08	-3.		
	59801987e-11					
769	-7.30408496e-05	-1.03530142e-02	-1.60975022e-08	2.		
	69635049e-06					
770	-1.85884201e-06	6.47032343e-06	6.05752161e-07	3.		
	73300521e-07					
771	4.88223353e-02	-1.71744756e-02	-3.12905112e-05	4.		
	85981669e-06					
772	1.61928814e+01	1.73499686e+01	3.19251885e-01	1.		
	43307724e+01					
773	1.37180960e+01	2.01639132e+00	7.93643474e-08	1.		
	27605252e-04					
774	-2.78702143e-05	1.24071912e-06	6.91948053e-01	3.		
	98489600e-01					
775	-3.26531897e-04	-5.38049141e-05	-3.57703708e-04	2.		
	62621290e-04					
776	-6.39289796e-02	-1.90039699e-06	-2.14744154e-04	-5.		
	43032521e-03					
777	8.04844228e-02	2.48078638e-04	4.82967257e-05	3.		
	71381139e-04					
778	1.42442844e-04	-6.12739765e-06	3.56921740e-05	-3.		
	07580358e-11					
779	-1.28886802e+01	-2.35737942e-11	8.33096807e-07	9.		
	60216923e+00					
780	8.41971055e+00	-7.26077874e+00	-5.98137961e-04	-4.		
	97977994e-01					
781	7.79503603e-01	-6.45093421e+00	1.05897229e+01	1.		
	26234769e+01					
782	-3.73867614e-05	1.19185979e-01	-6.57152286e-01	8.		
	76856982e-01					
783	-6.68278436e-01	-1.06479768e+01	-7.28078295e+00	-1.		
	88014707e+01					
784	1.33592506e+00	-3.45617927e-01	-9.81611525e+00	-9.		
	57801114e+00					
785	-8.63157521e-01	-4.26531744e+00	7.29584166e+00	1.		

```
785 36195681e+00
786 -3.59793411e-01 -1.73811392e+00 -1.97438757e+00]
787 norm absolute difference alpha: 0.0077125883511894085
788 norm absolute difference beta: 0.45195720652727933
789 LogLikelihood value: 11606.65889611271
790 Difference LogLikelihood value: -0.20509437105465622
791 E-step duration: 0:00:03
792 function value: 11641.051415696229 at iteration 1000
793 function value: 11641.040551524404 at iteration 2000
794 function value: 11641.037380471033 at iteration 3000
795 function value: 11641.03110487278 at iteration 4000
796 function value: 11641.026057965952 at iteration 5000
797 function value: 11641.019704227898 at iteration 6000
798 function value: 11641.01376242261 at iteration 7000
799 Optimization terminated successfully.
800 Current function value: 11641.010581
801 Iterations: 6813
802 Function evaluations: 7381
803
804 10 largest Differences in logl according to simplex
before termination:
805 [0.00147628 0.00147752 0.00148569 0.00149753 0.00150427 0
.00150695
806 0.00151316 0.00151981 0.00152265 0.0015289 ]
807
808 10 largest Differences in logl according to simplex at
termination:
809 [0.0022544 0.00225564 0.0022638 0.00227564 0.00228239 0
.00228507
810 0.00229127 0.00229792 0.00230077 0.00230702]
811
812 10 largest Differences in x according to simplex before
termination:
813 [0.06725631 0.0727691 0.07529165 0.08158646 0.08533574 0
.09119618
814 0.09499647 0.09616565 0.09884173 0.11856351]
815
816 10 largest Differences in x according to simplex at
termination:
817 [0.06627305 0.07132375 0.07144489 0.0753032 0.07815567 0
.08944651
818 0.08961226 0.09186787 0.09490884 0.09857705]
819 Finished iteration 9, duration M step 0:03:26
820 [ 3.14413653e-03 -2.28053763e-02 -9.16898313e-01 -7.
54155373e-05
821 -7.30880987e-01 1.92931678e-03 -1.07504575e-15 -4.
```

821	29207186e+00				
822	1.18102912e+00	-3.08016864e-04	4.70788505e-03	-2.	
	07667971e-04				
823	-8.71628580e-04	-2.33700750e+00	-8.70350510e-04	-8.	
	06920971e-02				
824	-2.19170572e-03	-1.61503950e-04	9.84788763e-09	2.	
	56653491e+00				
825	5.83182961e-03	-8.36957331e-07	-9.23825491e-04	2.	
	78713360e+01				
826	-2.97545298e-03	2.38196662e+01	1.10156391e-10	6.	
	43517784e+00				
827	-1.22186981e+00	3.94938459e-01	1.63620631e-03	3.	
	34346061e+00				
828	2.12714486e-13	1.54593887e+00	-3.68560529e+00	8.	
	53801336e-02				
829	-2.83674005e+00	-1.85429259e-03	-8.40725573e-01	3.	
	53045923e-02				
830	-2.71339629e-08	2.25561819e+00	-2.00826713e-02	1.	
	20057725e-05				
831	-2.36109061e+00	1.20706406e-03	4.37987124e+00	-1.	
	31826699e-06				
832	7.47781448e-05	1.74050293e+01	-9.65545497e-06	-7.	
	96522846e-13				
833	1.00089826e+01	-6.25032801e-01	1.50824566e+01	-1.	
	24749689e+00				
834	2.52861718e-01	-1.35477543e-08	7.48649037e-01	-3.	
	95731094e-04				
835	1.32760330e-03	-1.46443923e+00	1.75006655e+00	-1.	
	48579767e-03				
836	-3.81019645e-02	1.42226062e-03	-6.21631597e-03	1.	
	96394008e-05				
837	1.63909115e+00	1.89008977e-03	2.92833861e-03	-9.	
	90306983e-06				
838	7.91060777e-04	3.53228915e+00	1.67184508e-02	-3.	
	14681521e-03				
839	-5.24654070e-10	-3.27272268e-10	-1.26764679e+01	-4.	
	95696544e-11				
840	-1.60509183e+01	-6.27169661e-04	-1.84660917e-05	-1.	
	98591916e+00				
841	9.57210258e-03	-2.07670220e-04	-3.54735891e-04	4.	
	06380103e-04				
842	-1.45988158e-02	3.17096217e+00	4.10980057e+00	9.	
	92946038e+00				
843	-8.29840869e-03	1.60629701e-03	1.45532963e+00	1.	
	11685445e-05				
844	-1.29073304e-07	5.63318201e-07	-7.36786447e-04	9.	

844	99019967e-02					
845	2.07958326e-04	7.00638161e-05	-5.62862221e-03	2.		
	05668749e+00					
846	1.43273089e-02	1.00884577e-02	7.52663941e-07	1.		
	05998498e-07					
847	-2.97727257e-06	1.26274759e-05	1.68976222e-03	-1.		
	90354246e-03					
848	3.72773407e-04	-1.82753870e-03	5.41906598e-03	1.		
	27648087e-03					
849	-1.22059465e-03	2.22527589e-03	-1.44003064e-03	1.		
	90036493e+00					
850	-5.87349156e-02	1.83129538e-02	-8.23268307e-10	7.		
	51323152e-04					
851	1.81793149e-04	-1.95179407e-07	-2.29933558e-08	-3.		
	57314537e-11					
852	-7.57199022e-05	-9.18056861e-03	-1.61671866e-08	2.		
	68645058e-06					
853	-1.74720078e-06	6.09447107e-06	6.01792753e-07	3.		
	70198853e-07					
854	4.77286643e-02	-1.73227469e-02	-3.10938433e-05	4.		
	84363296e-06					
855	1.62267522e+01	1.74614157e+01	3.01518324e-01	1.		
	43847887e+01					
856	1.38700768e+01	2.01177922e+00	7.89752937e-08	1.		
	25539384e-04					
857	-2.78391532e-05	1.27356464e-06	6.73191116e-01	3.		
	92540909e-01					
858	-3.23349199e-04	-5.31426070e-05	-3.53205729e-04	2.		
	58665111e-04					
859	-7.16678765e-02	-1.88490715e-06	-2.10507066e-04	-6.		
	01507768e-03					
860	8.12678957e-02	2.47673390e-04	4.79494694e-05	3.		
	68267042e-04					
861	1.40305414e-04	-6.09642358e-06	3.64243586e-05	-3.		
	05964849e-11					
862	-1.28049304e+01	-2.37351521e-11	8.29781539e-07	9.		
	60404254e+00					
863	8.41213182e+00	-7.17802326e+00	-6.07008444e-04	-4.		
	98149918e-01					
864	7.78824599e-01	-6.34459051e+00	1.05894413e+01	1.		
	26234745e+01					
865	-3.45147691e-05	1.24237147e-01	-6.57414196e-01	8.		
	76789264e-01					
866	-6.67046710e-01	-1.07059570e+01	-7.28580897e+00	-1.		
	88987001e+01					
867	1.33917948e+00	-3.46660018e-01	-9.80652580e+00	-9.		

```
867 55006794e+00
868 -8.63253099e-01 -4.26485559e+00 7.29540054e+00 1.
     35820045e+00
869 -3.59199244e-01 -1.73759923e+00 -1.97636786e+00]
870 norm absolute difference alpha: 0.01075278784883214
871 norm absolute difference beta: 0.6085640064050092
872 LogLikelihood value: 11606.46887564344
873 Difference LogLikelihood value: -0.19002046927016636
874 E-step duration: 0:00:03
875 function value: 11640.820197115772 at iteration 1000
876 function value: 11640.815186318847 at iteration 2000
877 function value: 11640.81081322311 at iteration 3000
878 function value: 11640.804051554904 at iteration 4000
879 Optimization terminated successfully.
880         Current function value: 11640.802240
881         Iterations: 3775
882         Function evaluations: 4298
883
884 10 largest Differences in logl according to simplex
before termination:
885 [0.00157264 0.00157528 0.0015754 0.00158843 0.00160117 0
     .00160393
886 0.00161844 0.00162513 0.00162737 0.00163111]
887
888 10 largest Differences in logl according to simplex at
termination:
889 [0.00173194 0.00173457 0.0017347 0.00174773 0.00176046 0
     .00176322
890 0.00177774 0.00178442 0.00178666 0.0017904 ]
891
892 10 largest Differences in x according to simplex before
termination:
893 [0.0751759 0.07563595 0.07683849 0.07863036 0.08872703 0
     .08885569
894 0.09178607 0.09305885 0.09553924 0.10693475]
895
896 10 largest Differences in x according to simplex at
termination:
897 [0.07424888 0.07937105 0.07959543 0.08217591 0.08627236 0
     .08796105
898 0.09229486 0.09382451 0.09932424 0.09934884]
899 Finished iteration 10, duration M step 0:02:01
900 [ 3.16540057e-03 -2.29885937e-02 -9.14314688e-01 -7.
     51011966e-05
901 -7.52702514e-01 1.94513771e-03 -1.07283830e-15 -4.
     30994607e+00
```

902	1.17104726e+00	-3.12896989e-04	4.71029775e-03	-2.
	07436643e-04			
903	-8.75027539e-04	-2.35089837e+00	-7.85789294e-04	-8.
	03265517e-02			
904	-2.18970268e-03	-1.68915788e-04	9.82454763e-09	2.
	53808344e+00			
905	5.85655526e-03	-8.46464234e-07	-9.28450943e-04	2.
	79048004e+01			
906	-2.99191188e-03	2.38347340e+01	1.10095411e-10	6.
	43492926e+00			
907	-1.22186164e+00	3.95238344e-01	1.62599265e-03	3.
	34504268e+00			
908	2.11485811e-13	1.54950644e+00	-3.69475660e+00	8.
	58059094e-02			
909	-2.83519779e+00	-1.85748652e-03	-8.43192914e-01	3.
	54337524e-02			
910	-2.70402206e-08	2.26204394e+00	-2.01261053e-02	1.
	17578923e-05			
911	-2.37089272e+00	1.21091878e-03	4.37520773e+00	-1.
	30604648e-06			
912	7.50698662e-05	1.73444353e+01	-9.61881917e-06	-7.
	91521082e-13			
913	9.99210863e+00	-6.16387078e-01	1.50885744e+01	-1.
	25136527e+00			
914	2.52702423e-01	-1.35021905e-08	7.40531222e-01	-3.
	93889369e-04			
915	1.32887699e-03	-1.47354195e+00	1.74000295e+00	-1.
	46448428e-03			
916	-3.78549874e-02	1.42375203e-03	-6.25798292e-03	1.
	99800831e-05			
917	1.65424869e+00	1.88970618e-03	3.04940228e-03	-9.
	83297678e-06			
918	7.52136851e-04	3.56654044e+00	1.61957548e-02	-3.
	16712886e-03			
919	-5.22207580e-10	-3.28273210e-10	-1.25897959e+01	-5.
	00703047e-11			
920	-1.60462341e+01	-6.29990086e-04	-1.83946684e-05	-2.
	02431006e+00			
921	9.62097483e-03	-2.06160878e-04	-3.57305970e-04	4.
	05346260e-04			
922	-1.46825987e-02	3.12201901e+00	4.14206917e+00	9.
	95926325e+00			
923	-8.32514542e-03	1.60504894e-03	1.46856731e+00	1.
	11204327e-05			
924	-1.28787343e-07	5.61320389e-07	-7.42522832e-04	1.
	20660702e-01			

925	2.09419624e-04	7.05720277e-05	-5.66384904e-03	2.
	13715121e+00			
926	1.43861665e-02	9.98273536e-03	7.49408819e-07	1.
	05320182e-07			
927	-2.94945595e-06	1.24847731e-05	1.69130345e-03	-1.
	90851724e-03			
928	3.72464431e-04	-1.83693161e-03	5.75404107e-03	1.
	24234715e-03			
929	-1.22734947e-03	2.21638948e-03	-1.36982390e-03	1.
	89453874e+00			
930	-6.01603772e-02	1.82896113e-02	-8.26816131e-10	7.
	56114789e-04			
931	1.81566941e-04	-1.94312376e-07	-2.29157988e-08	-3.
	55349281e-11			
932	-7.54895951e-05	-9.23359174e-03	-1.61519467e-08	2.
	67638764e-06			
933	-1.73995963e-06	6.04638590e-06	5.95387855e-07	3.
	66605197e-07			
934	4.72024405e-02	-1.72818759e-02	-3.10552217e-05	4.
	70562075e-06			
935	1.62335151e+01	1.74311255e+01	2.93081422e-01	1.
	43890527e+01			
936	1.38813466e+01	2.01100390e+00	7.86633119e-08	1.
	25328894e-04			
937	-2.76782478e-05	1.26923413e-06	6.69944474e-01	3.
	91885493e-01			
938	-3.24209385e-04	-5.29282385e-05	-3.51653121e-04	2.
	58474878e-04			
939	-7.13895659e-02	-1.87062415e-06	-2.10729549e-04	-6.
	02888697e-03			
940	8.08014758e-02	2.49858413e-04	4.76949441e-05	3.
	65170737e-04			
941	1.39698404e-04	-6.04583206e-06	3.61828363e-05	-3.
	03618323e-11			
942	-1.28693670e+01	-2.36944143e-11	8.21122137e-07	9.
	59797779e+00			
943	8.41188985e+00	-7.23347202e+00	-6.08703352e-04	-5.
	00077015e-01			
944	7.76911428e-01	-6.39025906e+00	1.05891310e+01	1.
	26230870e+01			
945	-3.44981925e-05	1.24637052e-01	-6.57943757e-01	8.
	77171505e-01			
946	-6.66220163e-01	-1.06751290e+01	-7.28942105e+00	-1.
	88321680e+01			
947	1.34067728e+00	-3.46599858e-01	-9.79030358e+00	-9.
	55845796e+00			

```
948 -8.63166396e-01 -4.26455757e+00 7.29563048e+00 1.  
35691940e+00  
949 -3.59005000e-01 -1.73765761e+00 -1.97632450e+00]  
950 norm absolute difference alpha: 0.008776130087190769  
951 norm absolute difference beta: 0.48502295993042294  
952 LogLikelihood value: 11606.384290498932  
953 Difference LogLikelihood value: -0.0845851445083099  
954 E-step duration: 0:00:03  
955 function value: 11640.830680014304 at iteration 1000  
956 function value: 11640.823514331752 at iteration 2000  
957 function value: 11640.81964046037 at iteration 3000  
958 Optimization terminated successfully.  
959 Current function value: 11640.816435  
960 Iterations: 3160  
961 Function evaluations: 3676  
962  
963 10 largest Differences in logl according to simplex  
before termination:  
964 [0.00103995 0.00104043 0.00104468 0.00104922 0.00104929 0  
.00105009  
965 0.00105559 0.00105773 0.00106334 0.00106711]  
966  
967 10 largest Differences in logl according to simplex at  
termination:  
968 [0.00151617 0.00151665 0.0015209 0.00152544 0.00152551 0  
.00152631  
969 0.00153181 0.00153395 0.00153955 0.00154333]  
970  
971 10 largest Differences in x according to simplex before  
termination:  
972 [0.05079587 0.05475141 0.06822983 0.074458 0.07623384 0  
.07876761  
973 0.08649122 0.09302453 0.1005233 0.10117086]  
974  
975 10 largest Differences in x according to simplex at  
termination:  
976 [0.05087814 0.06586616 0.06609892 0.07371296 0.076084 0  
.08331678  
977 0.08381857 0.08839782 0.09769339 0.09822769]  
978 Finished iteration 11, duration M step 0:01:45  
979 [ 3.13820283e-03 -2.29947799e-02 -9.11489126e-01 -7.  
56579811e-05  
980 -8.02784452e-01 1.94410404e-03 -1.07894284e-15 -4.  
32366773e+00  
981 1.16885978e+00 -3.12277909e-04 4.72860834e-03 -2.  
07223306e-04
```

982	-8.74786483e-04	-2.36432666e+00	-7.86760704e-04	-7.
	97707811e-02			
983	-2.19950103e-03	-1.69248028e-04	9.82173064e-09	2.
	51204573e+00			
984	5.81101891e-03	-8.41928491e-07	-9.28010864e-04	2.
	79169054e+01			
985	-3.00055908e-03	2.38514751e+01	1.11618592e-10	6.
	43250011e+00			
986	-1.22205728e+00	3.95380511e-01	1.63195627e-03	3.
	34309307e+00			
987	2.11571581e-13	1.55451176e+00	-3.70065287e+00	8.
	55498573e-02			
988	-2.83769366e+00	-1.85778507e-03	-8.42624060e-01	3.
	53275912e-02			
989	-2.70404669e-08	2.26310639e+00	-2.00764356e-02	1.
	17166183e-05			
990	-2.37210219e+00	1.21954576e-03	4.37463113e+00	-1.
	30279202e-06			
991	7.50863877e-05	1.73194848e+01	-9.60777318e-06	-7.
	92712073e-13			
992	9.98071538e+00	-6.17279712e-01	1.50907329e+01	-1.
	25230884e+00			
993	2.53916192e-01	-1.35956486e-08	7.30860833e-01	-3.
	94879893e-04			
994	1.32943788e-03	-1.47182171e+00	1.72487374e+00	-1.
	46475278e-03			
995	-3.75989504e-02	1.42338083e-03	-6.38327506e-03	1.
	99597303e-05			
996	1.64974510e+00	1.89144996e-03	3.00698699e-03	-9.
	92636345e-06			
997	7.51820893e-04	3.56395138e+00	1.60146669e-02	-3.
	14184673e-03			
998	-5.23295126e-10	-3.30273746e-10	-1.26125751e+01	-5.
	05113348e-11			
999	-1.60453785e+01	-6.34098145e-04	-1.92290994e-05	-2.
	03501466e+00			
1000	9.69713326e-03	-2.04159170e-04	-3.69258016e-04	4.
	05578866e-04			
1001	-1.46430059e-02	3.14125215e+00	4.16940258e+00	9.
	97990733e+00			
1002	-8.38339795e-03	1.59574067e-03	1.48177080e+00	1.
	09971603e-05			
1003	-1.28831220e-07	5.60155312e-07	-7.32465131e-04	1.
	27828751e-01			
1004	2.07081002e-04	7.05263859e-05	-5.65149035e-03	2.
	22387119e+00			

1005	1.43672934e-02	9.84830690e-03	7.45886810e-07	1.
	07292286e-07			
1006	-2.97369390e-06	1.24494242e-05	1.67940817e-03	-1.
	91692739e-03			
1007	3.72731177e-04	-1.59697072e-03	5.77915463e-03	1.
	23970556e-03			
1008	-1.22762522e-03	2.22430734e-03	-1.36658180e-03	1.
	88851135e+00			
1009	-6.11329330e-02	1.82045089e-02	-8.31746959e-10	7.
	59030880e-04			
1010	1.77124407e-04	-1.93295562e-07	-2.29742860e-08	-3.
	56140869e-11			
1011	-7.47155377e-05	-9.23632439e-03	-1.62929056e-08	2.
	73406024e-06			
1012	-1.72409630e-06	5.86712444e-06	5.95679801e-07	3.
	33954426e-07			
1013	4.62735663e-02	-1.71693262e-02	-3.10374753e-05	4.
	62813469e-06			
1014	1.62850403e+01	1.74691884e+01	2.85384651e-01	1.
	44342087e+01			
1015	1.39409251e+01	2.01360188e+00	7.85420628e-08	1.
	29118362e-04			
1016	-2.77329133e-05	1.26965672e-06	6.70165974e-01	3.
	92364279e-01			
1017	-3.24202535e-04	-5.30163645e-05	-3.59276146e-04	2.
	56513071e-04			
1018	-7.09366259e-02	-1.87610367e-06	-2.10850268e-04	-6.
	06304840e-03			
1019	8.01784749e-02	2.49093266e-04	4.77344284e-05	3.
	66393475e-04			
1020	1.40654315e-04	-6.04391950e-06	3.61914440e-05	-3.
	06743474e-11			
1021	-1.29185245e+01	-2.37985354e-11	8.33603025e-07	9.
	59855579e+00			
1022	8.41234473e+00	-7.26290361e+00	-6.05476842e-04	-5.
	00687360e-01			
1023	7.75179480e-01	-6.40402845e+00	1.05888107e+01	1.
	26226515e+01			
1024	-3.44772195e-05	1.25648983e-01	-6.58090608e-01	8.
	77248272e-01			
1025	-6.65973861e-01	-1.07009119e+01	-7.29549128e+00	-1.
	88460561e+01			
1026	1.34183472e+00	-3.46882948e-01	-9.82200358e+00	-9.
	58217087e+00			
1027	-8.63207084e-01	-4.26449844e+00	7.29558432e+00	1.
	35629485e+00			

```
1028 -3.5888954e-01 -1.73782330e+00 -1.97657678e+00]
1029 norm absolute difference alpha: 0.007373328225377265
1030 norm absolute difference beta: 0.3337144523956317
1031 LogLikelihood value: 11606.289122008498
1032 Difference LogLikelihood value: -0.0951684904339345
1033 E-step duration: 0:00:03
1034 function value: 11640.829796046864 at iteration 1000
1035 function value: 11640.821535011686 at iteration 2000
1036 function value: 11640.817167984487 at iteration 3000
1037 function value: 11640.811481411625 at iteration 4000
1038 function value: 11640.805513275518 at iteration 5000
1039 function value: 11640.799934297247 at iteration 6000
1040 function value: 11640.794655347463 at iteration 7000
1041 function value: 11640.789272694197 at iteration 8000
1042 Optimization terminated successfully.
1043             Current function value: 11640.786652
1044             Iterations: 7808
1045             Function evaluations: 8334
1046
1047 10 largest Differences in logl according to simplex
before termination:
1048 [0.00129394 0.00129864 0.00130165 0.00130266 0.00131007
 0.0013107
1049 0.00131168 0.00131768 0.00132189 0.00132239]
1050
1051 10 largest Differences in logl according to simplex at
termination:
1052 [0.00174104 0.00174574 0.00174875 0.00174976 0.00175717
 0.0017578
1053 0.00175878 0.00176478 0.00176899 0.00176949]
1054
1055 10 largest Differences in x according to simplex before
termination:
1056 [0.06837771 0.06880904 0.0695877 0.07040098 0.07184516
 0.08560243
1057 0.08583819 0.09568379 0.0974476 0.09925251]
1058
1059 10 largest Differences in x according to simplex at
termination:
1060 [0.06620088 0.0690761 0.07107502 0.07797912 0.07854202
 0.09059831
1061 0.09100251 0.09185654 0.09266203 0.09826329]
1062 Finished iteration 12, duration M step 0:03:49
1063 [ 2.91506490e-03 -2.39996103e-02 -8.98811905e-01 -6.
 05237993e-05
1064 -8.54298577e-01 1.93821970e-03 -1.10042508e-15 -4.
```

1064	38601700e+00					
1065	1.14560356e+00	-3.12679511e-04	5.04243072e-03	-2.		
	09270191e-04					
1066	-8.79994817e-04	-2.44853605e+00	-8.20403315e-04	-8.		
	31502345e-02					
1067	-2.15194343e-03	-1.82437715e-04	9.51244393e-09	2.		
	48932098e+00					
1068	5.08551829e-03	-7.90918251e-07	-9.91306681e-04	2.		
	79649573e+01					
1069	-3.03361359e-03	2.39424421e+01	1.11915686e-10	6.		
	43118970e+00					
1070	-1.22196974e+00	3.96367108e-01	1.80309945e-03	3.		
	33803851e+00					
1071	2.24738396e-13	1.56698374e+00	-3.68805007e+00	8.		
	57007491e-02					
1072	-2.85779867e+00	-1.90570845e-03	-8.63364148e-01	3.		
	20232209e-02					
1073	-2.58073129e-08	2.28556483e+00	-1.61560522e-02	1.		
	19047770e-05					
1074	-2.37594926e+00	1.22080161e-03	4.39743499e+00	-1.		
	33861184e-06					
1075	7.31638459e-05	1.73286068e+01	-9.56526672e-06	-7.		
	43434357e-13					
1076	9.96805809e+00	-6.35008626e-01	1.51134063e+01	-1.		
	25454719e+00					
1077	2.51253971e-01	-1.63165913e-08	7.25382013e-01	-4.		
	00310756e-04					
1078	1.35340282e-03	-1.50374443e+00	1.73203756e+00	-1.		
	27515735e-03					
1079	-3.71057339e-02	1.40050364e-03	-6.43908201e-03	1.		
	97885189e-05					
1080	1.70210305e+00	1.98257077e-03	3.00483228e-03	-1.		
	07371992e-05					
1081	7.83409519e-04	3.61138101e+00	1.50887313e-02	-2.		
	86467228e-03					
1082	-4.96806123e-10	-3.30285749e-10	-1.26443607e+01	-5.		
	80060934e-11					
1083	-1.60180009e+01	-6.41298857e-04	-1.81985934e-05	-2.		
	14561991e+00					
1084	1.00142305e-02	-1.91840525e-04	-3.77307064e-04	4.		
	06442383e-04					
1085	-1.49369718e-02	3.27756915e+00	4.28825748e+00	1.		
	00347128e+01					
1086	-8.83658174e-03	1.52951576e-03	1.47863382e+00	1.		
	01832069e-05					
1087	-1.20855640e-07	5.36965065e-07	-8.15403753e-04	2.		

1087	30904822e-01				
1088	1.95066755e-04	8.10206392e-05	-5.63110756e-03	2.	
	46320524e+00				
1089	1.48012978e-02	9.75634763e-03	6.93619591e-07	1.	
	06695641e-07				
1090	-2.94842331e-06	1.21232543e-05	1.61239444e-03	-1.	
	93078141e-03				
1091	3.47667537e-04	-1.61012414e-03	5.77133438e-03	1.	
	28879489e-03				
1092	-1.01353421e-03	2.27807318e-03	-1.40759624e-03	1.	
	88973195e+00				
1093	-6.15579841e-02	2.17893975e-02	-8.30625165e-10	7.	
	32940804e-04				
1094	1.80598790e-04	-2.20057069e-07	-2.17958653e-08	-3.	
	35174568e-11				
1095	-7.06299024e-05	-9.12187398e-03	-1.36330177e-08	2.	
	52596889e-06				
1096	-1.58714968e-06	5.81058130e-06	6.01148639e-07	3.	
	33692705e-07				
1097	4.58825577e-02	-1.30811729e-02	-2.90281096e-05	3.	
	93660410e-06				
1098	1.64593563e+01	1.76844752e+01	2.83946276e-01	1.	
	46301459e+01				
1099	1.41304796e+01	2.01901329e+00	6.62858372e-08	1.	
	30052427e-04				
1100	-2.71578684e-05	1.15376523e-06	6.67437102e-01	4.	
	05680260e-01				
1101	-3.28604544e-04	-5.24836885e-05	-3.55958163e-04	2.	
	60467861e-04				
1102	-6.95881185e-02	-1.73001989e-06	-2.16016578e-04	-7.	
	19040452e-03				
1103	7.69868675e-02	2.48057585e-04	5.51696903e-05	3.	
	39611510e-04				
1104	1.37714725e-04	-6.01679714e-06	3.66567445e-05	-2.	
	96770661e-11				
1105	-1.29834618e+01	-2.05101264e-11	8.33360264e-07	9.	
	59098026e+00				
1106	8.40567711e+00	-7.27660411e+00	-5.87240038e-04	-5.	
	03288778e-01				
1107	7.71503381e-01	-6.43853781e+00	1.05877422e+01	1.	
	26210523e+01				
1108	-3.42423165e-05	1.28145722e-01	-6.58102283e-01	8.	
	77751021e-01				
1109	-6.64369435e-01	-1.07168862e+01	-7.28979670e+00	-1.	
	89039853e+01				
1110	1.34339861e+00	-3.47320931e-01	-9.82177657e+00	-9.	

```
1110 59364334e+00
1111 -8.62643208e-01 -4.26332320e+00 7.29488597e+00 1.
      35414234e+00
1112 -3.58378213e-01 -1.73769620e+00 -1.97654993e+00]
1113 norm absolute difference alpha: 0.007773961733098416
1114 norm absolute difference beta: 0.25270625116788503
1115 LogLikelihood value: 11606.076640149524
1116 Difference LogLikelihood value: -0.21248185897457006
1117 E-step duration: 0:00:03
1118 function value: 11640.46299867178 at iteration 1000
1119 function value: 11640.456146728251 at iteration 2000
1120 Optimization terminated successfully.
1121           Current function value: 11640.454468
1122           Iterations: 1954
1123           Function evaluations: 2479
1124
1125 10 largest Differences in logl according to simplex
before termination:
1126 [0.00078327 0.00078534 0.00078614 0.00078889 0.00079107
  0.00079693
1127 0.00079698 0.00079963 0.0008082 0.00080875]
1128
1129 10 largest Differences in logl according to simplex at
termination:
1130 [0.00086846 0.00087053 0.00087133 0.00087408 0.00087625
  0.00088211
1131 0.00088217 0.00088481 0.00089339 0.00089394]
1132
1133 10 largest Differences in x according to simplex before
termination:
1134 [0.05793919 0.06007555 0.06813697 0.07101155 0.07266709
  0.07614353
1135 0.0788232 0.08289901 0.08845879 0.10342813]
1136
1137 10 largest Differences in x according to simplex at
termination:
1138 [0.05471303 0.05656465 0.06633787 0.06875463 0.07005753
  0.07212417
1139 0.08032774 0.08375683 0.08636155 0.09873478]
1140 Finished iteration 13, duration M step 0:01:10
1141 [ 2.92837583e-03 -2.40315081e-02 -8.98383839e-01 -6.
  05884046e-05
1142 -8.67060008e-01 1.94058289e-03 -1.10106386e-15 -4.
  38246288e+00
1143 1.13736646e+00 -3.15474662e-04 5.04246087e-03 -2.
  10709778e-04
```

1144	-8.80995938e-04	-2.44895077e+00	-8.24061836e-04	-8. 28705092e-02	
1145	-2.15002837e-03	-1.83412305e-04	9.49377171e-09	2. 47923505e+00	
1146	5.08688869e-03	-7.90195478e-07	-9.92857510e-04	2. 80061948e+01	
1147	-3.03284976e-03	2.39510316e+01	1.12181266e-10	6. 42947531e+00	
1148	-1.22231912e+00	3.96287268e-01	1.80294166e-03	3. 33429918e+00	
1149	2.24726066e-13	1.56823474e+00	-3.69874213e+00	8. 59671970e-02	
1150	-2.85701973e+00	-1.85106675e-03	-8.57651599e-01	3. 19959593e-02	
1151	-2.57895741e-08	2.28465757e+00	-1.61503327e-02	1. 19097210e-05	
1152	-2.37498113e+00	1.22104187e-03	4.39874855e+00	-1. 34116460e-06	
1153	6.63784931e-05	1.73374909e+01	-9.57491837e-06	-7. 44268534e-13	
1154	9.96250405e+00	-6.34626846e-01	1.51152422e+01	-1. 25486461e+00	
1155	2.51473167e-01	-1.63776382e-08	7.21315536e-01	-4. 01865875e-04	
1156	1.36661583e-03	-1.49434945e+00	1.72083887e+00	-1. 29097426e-03	
1157	-3.70246837e-02	1.40468202e-03	-6.43911696e-03	1. 98122881e-05	
1158	1.69150352e+00	1.98112541e-03	3.00156440e-03	-1. 07274239e-05	
1159	7.87943802e-04	3.59930572e+00	1.51014187e-02	-2. 86567690e-03	
1160	-4.98435535e-10	-3.30381945e-10	-1.26307885e+01	-5. 80550143e-11	
1161	-1.60501181e+01	-6.41536400e-04	-1.81917225e-05	-2. 14325820e+00	
1162	1.00169459e-02	-1.91828894e-04	-3.76922372e-04	4. 10845023e-04	
1163	-1.49401699e-02	3.25533150e+00	4.30364581e+00	1. 00624347e+01	
1164	-8.83766893e-03	1.52974492e-03	1.48661663e+00	1. 01784519e-05	
1165	-1.20699298e-07	5.36426266e-07	-8.16349310e-04	2. 35483055e-01	
1166	1.95084445e-04	8.11850671e-05	-5.62954366e-03	2. 54002599e+00	

1167	1.48067443e-02	9.70787830e-03	6.93072166e-07	1.
	07165828e-07			
1168	-2.96044856e-06	1.21409972e-05	1.61454423e-03	-1.
	93103972e-03			
1169	3.47365346e-04	-1.61015835e-03	5.77032947e-03	1.
	29174249e-03			
1170	-1.00883296e-03	2.27552812e-03	-1.40935279e-03	1.
	87984564e+00			
1171	-6.21655835e-02	2.17082631e-02	-8.32867647e-10	7.
	32556443e-04			
1172	1.80617698e-04	-2.19827038e-07	-2.17649342e-08	-3.
	36441162e-11			
1173	-7.06537114e-05	-9.16348539e-03	-1.36959788e-08	2.
	52472754e-06			
1174	-1.58603817e-06	5.80206407e-06	6.04844004e-07	3.
	35390750e-07			
1175	4.50136915e-02	-1.30918278e-02	-2.91850491e-05	3.
	94317802e-06			
1176	1.64458818e+01	1.76429488e+01	2.81403890e-01	1.
	46218163e+01			
1177	1.41384193e+01	2.02215260e+00	6.62167186e-08	1.
	31174182e-04			
1178	-2.72587521e-05	1.15243309e-06	6.71668523e-01	4.
	05730195e-01			
1179	-3.29682819e-04	-5.27643514e-05	-3.57940464e-04	2.
	60621421e-04			
1180	-6.93957502e-02	-1.73690359e-06	-2.18865823e-04	-7.
	19013291e-03			
1181	7.68040731e-02	2.48344627e-04	5.53955615e-05	3.
	40912758e-04			
1182	1.37720630e-04	-6.02089013e-06	3.67886987e-05	-2.
	96537855e-11			
1183	-1.29805395e+01	-2.05133507e-11	8.31753893e-07	9.
	59497863e+00			
1184	8.40344867e+00	-7.26433415e+00	-5.87957758e-04	-5.
	03487245e-01			
1185	7.71361291e-01	-6.40516522e+00	1.05874604e+01	1.
	26208898e+01			
1186	-3.45168633e-05	1.28176848e-01	-6.58322664e-01	8.
	77678113e-01			
1187	-6.64582803e-01	-1.06817259e+01	-7.28193058e+00	-1.
	88727799e+01			
1188	1.34410871e+00	-3.47323353e-01	-9.81411625e+00	-9.
	58011442e+00			
1189	-8.62893906e-01	-4.26313244e+00	7.29514290e+00	1.
	35374489e+00			

```
1190 -3.58258682e-01 -1.73772132e+00 -1.97694653e+00]
1191 norm absolute difference alpha: 0.009962912581600505
1192 norm absolute difference beta: 0.4510396231224527
1193 LogLikelihood value: 11606.033736993859
1194 Difference LogLikelihood value: -0.042903155665044324
1195 E-step duration: 0:00:03
1196 function value: 11640.447286460989 at iteration 1000
1197 function value: 11640.439765481238 at iteration 2000
1198 function value: 11640.435258802201 at iteration 3000
1199 function value: 11640.430545268497 at iteration 4000
1200 function value: 11640.425614301357 at iteration 5000
1201 function value: 11640.42050741089 at iteration 6000
1202 function value: 11640.415331815053 at iteration 7000
1203 Optimization terminated successfully.
1204 Current function value: 11640.412649
1205 Iterations: 6994
1206 Function evaluations: 7514
1207
1208 10 largest Differences in logl according to simplex
before termination:
1209 [0.00110783 0.00111688 0.0011267 0.0011296 0.00113422
0.00114342
1210 0.00114663 0.00114975 0.00115241 0.00115654]
1211
1212 10 largest Differences in logl according to simplex at
termination:
1213 [0.00160937 0.00161841 0.00162823 0.00163114 0.00163575
0.00164496
1214 0.00164817 0.00165128 0.00165395 0.00165808]
1215
1216 10 largest Differences in x according to simplex before
termination:
1217 [0.06633734 0.0698816 0.07608174 0.08002473 0.08285413
0.08708288
1218 0.09240141 0.10029151 0.105802 0.11142091]
1219
1220 10 largest Differences in x according to simplex at
termination:
1221 [0.06549744 0.06654646 0.07064288 0.08909809 0.08960228
0.08976578
1222 0.09089521 0.09428071 0.0958543 0.09803798]
1223 Finished iteration 14, duration M step 0:03:28
1224 [ 3.01020277e-03 -2.50874325e-02 -8.88065137e-01 -5.
95494935e-05
1225 -9.35956133e-01 1.19542360e-03 -1.07167083e-15 -4.
43536374e+00
```

1226	1.09870535e+00	-3.35197020e-04	5.36942636e-03	-2.
	12325253e-04			
1227	-8.97915727e-04	-2.50426956e+00	-8.65165495e-04	-8.
	19727267e-02			
1228	-2.19044080e-03	-1.86896085e-04	8.22352282e-09	2.
	44223459e+00			
1229	4.73067064e-03	-7.95726962e-07	-1.10902033e-03	2.
	80621357e+01			
1230	-3.14519604e-03	2.40233448e+01	1.06491162e-10	6.
	42599665e+00			
1231	-1.22369741e+00	3.97856833e-01	1.82782943e-03	3.
	35696966e+00			
1232	2.17405407e-13	1.59516632e+00	-3.73110478e+00	8.
	77114022e-02			
1233	-2.86146746e+00	-1.87628764e-03	-8.63457951e-01	2.
	77809250e-02			
1234	-2.96656340e-08	2.28895952e+00	-1.75492782e-02	1.
	34093046e-05			
1235	-2.40658210e+00	1.28168239e-03	4.42845451e+00	-1.
	39983711e-06			
1236	6.80552433e-05	1.73382411e+01	-9.18724162e-06	-7.
	20975588e-13			
1237	9.94502843e+00	-6.43030457e-01	1.51546171e+01	-1.
	25953757e+00			
1238	2.56163159e-01	-1.61791219e-08	6.53472128e-01	-4.
	06744611e-04			
1239	1.39213592e-03	-1.54202523e+00	1.72779105e+00	-1.
	36462186e-03			
1240	-3.72684651e-02	1.46336588e-03	-6.82421899e-03	1.
	95669416e-05			
1241	1.71557464e+00	2.00888722e-03	3.10874085e-03	-1.
	02240939e-05			
1242	7.92930379e-04	3.62659074e+00	1.28132931e-02	-2.
	88042116e-03			
1243	-4.77573552e-10	-3.15760887e-10	-1.26311789e+01	-5.
	65348031e-11			
1244	-1.60525423e+01	-7.36673104e-04	-1.76676183e-05	-2.
	30026576e+00			
1245	1.03901949e-02	-1.90243452e-04	-3.55571151e-04	4.
	00077807e-04			
1246	-1.60455863e-02	3.34254932e+00	4.38611827e+00	1.
	01098897e+01			
1247	-9.47473166e-03	1.46273146e-03	1.48412884e+00	9.
	97084683e-06			
1248	-1.22156140e-07	5.40557920e-07	-8.22919933e-04	3.
	26851731e-01			

1249	1.89779289e-04	8.47867717e-05	-5.74691187e-03	2.
	77328037e+00			
1250	1.54549719e-02	7.08963402e-03	6.82370975e-07	1.
	06047631e-07			
1251	-2.85468776e-06	1.18613146e-05	1.63537035e-03	-2.
	18451252e-03			
1252	3.56545456e-04	-1.45056691e-03	5.92511229e-03	1.
	34940278e-03			
1253	-1.08199981e-03	2.31554686e-03	-1.46691002e-03	1.
	88170580e+00			
1254	-6.36136714e-02	2.24598933e-02	-7.93080652e-10	8.
	86667014e-04			
1255	1.75197902e-04	-2.16905436e-07	-1.86422863e-08	-3.
	47917023e-11			
1256	-7.29696446e-05	-9.47468226e-03	-1.32961746e-08	2.
	46308959e-06			
1257	-1.75090969e-06	5.57057189e-06	5.91128798e-07	3.
	22360935e-07			
1258	4.33562623e-02	-1.25538068e-02	-2.94218775e-05	3.
	65110463e-06			
1259	1.65711837e+01	1.77561791e+01	2.93491834e-01	1.
	48200628e+01			
1260	1.42484611e+01	2.02446527e+00	3.62741205e-08	1.
	50625143e-04			
1261	-2.70567953e-05	1.13072586e-06	7.20697538e-01	4.
	17070066e-01			
1262	-3.04136325e-04	-5.36002321e-05	-4.08994492e-04	2.
	53136826e-04			
1263	-6.08940502e-02	-1.65764994e-06	-2.22626665e-04	-7.
	15676645e-03			
1264	7.65403570e-02	2.45044426e-04	5.30361945e-05	3.
	33041603e-04			
1265	1.24914368e-04	-5.81067112e-06	3.65381903e-05	-3.
	13833771e-11			
1266	-1.30630531e+01	-1.64942094e-11	7.81884562e-07	9.
	59826378e+00			
1267	8.40589647e+00	-7.27588015e+00	-4.91048672e-04	-5.
	05261280e-01			
1268	7.69175903e-01	-6.45416983e+00	1.05865357e+01	1.
	26202518e+01			
1269	-3.50816124e-05	1.29761978e-01	-6.58541390e-01	8.
	78794553e-01			
1270	-6.63818073e-01	-1.06936221e+01	-7.33540154e+00	-1.
	88337661e+01			
1271	1.34622491e+00	-3.47212531e-01	-9.79815506e+00	-9.
	58051423e+00			

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1272 -8.63072590e-01 -4.26350656e+00 7.29368170e+00 1.  
35246024e+00  
1273 -3.58034996e-01 -1.73809679e+00 -1.97691001e+00]  
1274 norm absolute difference alpha: 0.006683620864631593  
1275 norm absolute difference beta: 0.23795374961190852  
1276 LogLikelihood value: 11605.861207388394  
1277 Difference LogLikelihood value: -0.17252960546466056  
1278 E-step duration: 0:00:03  
1279 function value: 11640.090334393095 at iteration 1000  
1280 Optimization terminated successfully.  
1281 Current function value: 11640.084393  
1282 Iterations: 1384  
1283 Function evaluations: 1910  
1284  
1285 10 largest Differences in logl according to simplex  
before termination:  
1286 [0.00074783 0.00074983 0.00075123 0.00075452 0.00075747  
0.00075772  
1287 0.00076077 0.00076117 0.00076272 0.0007655 ]  
1288  
1289 10 largest Differences in logl according to simplex at  
termination:  
1290 [0.00098349 0.0009855 0.0009869 0.00099018 0.00099313  
0.00099338  
1291 0.00099643 0.00099736 0.00099838 0.00100117]  
1292  
1293 10 largest Differences in x according to simplex before  
termination:  
1294 [0.06187583 0.07533639 0.07596606 0.07663012 0.07819641  
0.07925347  
1295 0.08039201 0.08249274 0.08822908 0.10165914]  
1296  
1297 10 largest Differences in x according to simplex at  
termination:  
1298 [0.05955048 0.07319578 0.07581258 0.07925153 0.08011254  
0.08152677  
1299 0.08372182 0.08753913 0.08797085 0.09757507]  
1300 Finished iteration 15, duration M step 0:00:54  
1301 [ 3.01606949e-03 -2.50700086e-02 -8.87619779e-01 -5.  
97626531e-05  
1302 -9.37120602e-01 1.19773479e-03 -1.07056051e-15 -4.  
43631025e+00  
1303 1.09266203e+00 -3.35904479e-04 5.37385273e-03 -2.  
12756112e-04  
1304 -8.99642049e-04 -2.50481015e+00 -8.66653827e-04 -8.  
16242238e-02
```

1305	-2.19412891e-03	-1.87280601e-04	8.22764219e-09	2.
	43035421e+00			
1306	4.73973843e-03	-7.95263695e-07	-1.11114157e-03	2.
	80885039e+01			
1307	-3.14875486e-03	2.40291203e+01	1.06531941e-10	6.
	42419209e+00			
1308	-1.22373216e+00	3.97918502e-01	1.83034887e-03	3.
	35475573e+00			
1309	2.17151853e-13	1.59679159e+00	-3.73185495e+00	8.
	85312732e-02			
1310	-2.86695996e+00	-1.87965790e-03	-8.63295485e-01	2.
	77125305e-02			
1311	-2.96679937e-08	2.29354570e+00	-1.75651980e-02	1.
	34031874e-05			
1312	-2.39986844e+00	1.28058754e-03	4.42482669e+00	-1.
	40368078e-06			
1313	6.81946770e-05	1.73654936e+01	-9.18018150e-06	-7.
	20301943e-13			
1314	9.93957213e+00	-6.41522103e-01	1.51533602e+01	-1.
	25953240e+00			
1315	2.56070894e-01	-1.61728789e-08	6.53456535e-01	-4.
	07647493e-04			
1316	1.39501938e-03	-1.53095498e+00	1.71563504e+00	-1.
	36763418e-03			
1317	-3.71487644e-02	1.46616097e-03	-6.82779483e-03	1.
	96314255e-05			
1318	1.70666565e+00	2.01245431e-03	3.11262652e-03	-1.
	02139162e-05			
1319	7.94489230e-04	3.62297347e+00	1.16181239e-02	-2.
	90667729e-03			
1320	-4.76983455e-10	-3.15282802e-10	-1.26304631e+01	-5.
	74221696e-11			
1321	-1.60815034e+01	-7.36788082e-04	-1.76978164e-05	-2.
	30127880e+00			
1322	1.03776268e-02	-1.92310278e-04	-3.56053479e-04	4.
	00935247e-04			
1323	-1.60134849e-02	3.32468196e+00	4.40081929e+00	1.
	01057422e+01			
1324	-9.46957910e-03	1.47525458e-03	1.49005750e+00	9.
	98534597e-06			
1325	-1.21992603e-07	5.40018305e-07	-8.31344828e-04	3.
	32895743e-01			
1326	1.90136565e-04	8.49406835e-05	-5.73012628e-03	2.
	83328487e+00			
1327	1.54291317e-02	7.05406392e-03	6.85007762e-07	1.
	05986421e-07			

1328	-2.85327872e-06	1.18554571e-05	1.65068984e-03	-2.
	18843150e-03			
1329	3.57098041e-04	-1.45038196e-03	5.92923960e-03	1.
	35198941e-03			
1330	-1.08184612e-03	2.31936331e-03	-1.46951219e-03	1.
	87436365e+00			
1331	-6.44425489e-02	2.23644927e-02	-7.93242933e-10	8.
	87549258e-04			
1332	1.75516126e-04	-2.16762467e-07	-1.86166895e-08	-3.
	47889028e-11			
1333	-7.31027202e-05	-9.55993321e-03	-1.32930580e-08	2.
	46642336e-06			
1334	-1.75085533e-06	5.56739442e-06	5.90623114e-07	3.
	22115147e-07			
1335	4.31510851e-02	-1.25635445e-02	-2.94793315e-05	3.
	68501690e-06			
1336	1.65814915e+01	1.77584853e+01	2.90255705e-01	1.
	47951804e+01			
1337	1.42797038e+01	2.02593365e+00	3.62347895e-08	1.
	50952659e-04			
1338	-2.71179588e-05	1.13036140e-06	7.18722461e-01	4.
	15238361e-01			
1339	-3.04720334e-04	-5.36991783e-05	-4.09838803e-04	2.
	53606667e-04			
1340	-6.06601073e-02	-1.65603477e-06	-2.23090295e-04	-7.
	15744786e-03			
1341	7.61894889e-02	2.45785742e-04	5.31473634e-05	3.
	32889951e-04			
1342	1.25179048e-04	-5.80895800e-06	3.66211706e-05	-3.
	13578229e-11			
1343	-1.30535734e+01	-1.65008449e-11	7.81379316e-07	9.
	60073961e+00			
1344	8.40373496e+00	-7.26464695e+00	-4.95088827e-04	-5.
	05558704e-01			
1345	7.68890126e-01	-6.43313865e+00	1.05862756e+01	1.
	26200893e+01			
1346	-3.51543822e-05	1.29723935e-01	-6.58286961e-01	8.
	78635513e-01			
1347	-6.63974660e-01	-1.06893670e+01	-7.31144750e+00	-1.
	88404878e+01			
1348	1.34617137e+00	-3.47447626e-01	-9.80330675e+00	-9.
	57325165e+00			
1349	-8.63240943e-01	-4.26335151e+00	7.29405670e+00	1.
	35197419e+00			
1350	-3.58171151e-01	-1.73829477e+00	-1.97736171e+00]	
1351	norm absolute difference alpha:	0.008507660761031925		

```
1352 norm absolute difference beta: 0.4403487049502411
1353 LogLikelihood value: 11605.830357480423
1354 Difference LogLikelihood value: -0.03084990797106002
1355 E-step duration: 0:00:03
1356 function value: 11640.074491629295 at iteration 1000
1357 Optimization terminated successfully.
1358         Current function value: 11640.069328
1359         Iterations: 1326
1360         Function evaluations: 1834
1361
1362 10 largest Differences in logl according to simplex
before termination:
1363 [0.00050853 0.00050928 0.00050941 0.00051244 0.00051357
0.00051372
1364 0.00051394 0.00051569 0.00051793 0.00051816]
1365
1366 10 largest Differences in logl according to simplex at
termination:
1367 [0.00078338 0.00078414 0.00078426 0.0007873 0.00078842
0.00078858
1368 0.00078879 0.00079054 0.00079278 0.00079301]
1369
1370 10 largest Differences in x according to simplex before
termination:
1371 [0.05834687 0.06959614 0.07422921 0.07581617 0.07985772
0.08281675
1372 0.08545719 0.08565038 0.09907044 0.09953707]
1373
1374 10 largest Differences in x according to simplex at
termination:
1375 [0.05926814 0.06552981 0.07391438 0.07910512 0.08146935
0.08162954
1376 0.08416924 0.09038608 0.09526007 0.09602113]
1377 Finished iteration 16, duration M step 0:00:53
1378 [ 3.01843324e-03 -2.51284864e-02 -8.87143121e-01 -5.
97531633e-05
1379 -9.41927317e-01 1.19853144e-03 -1.07097735e-15 -4.
44111380e+00
1380 1.08915143e+00 -3.35818530e-04 5.39391775e-03 -2.
12716832e-04
1381 -9.00154505e-04 -2.50356322e+00 -8.67964569e-04 -8.
17275194e-02
1382 -2.19814111e-03 -1.87235724e-04 8.22821234e-09 2.
41774138e+00
1383 4.74549495e-03 -7.96011156e-07 -1.11214082e-03 2.
81124322e+01
```

1384	-3.15875441e-03	2.40356517e+01	1.06530894e-10	6.
	42312074e+00			
1385	-1.22395995e+00	3.97964844e-01	1.83512829e-03	3.
	35305486e+00			
1386	2.17226876e-13	1.59618503e+00	-3.72976392e+00	8.
	87453114e-02			
1387	-2.87076042e+00	-1.88296039e-03	-8.63624780e-01	2.
	77591276e-02			
1388	-2.96658561e-08	2.29513719e+00	-1.76249646e-02	1.
	33997948e-05			
1389	-2.39316277e+00	1.28585217e-03	4.42361483e+00	-1.
	40334614e-06			
1390	6.82041137e-05	1.73741143e+01	-9.17873688e-06	-7.
	20453018e-13			
1391	9.93479313e+00	-6.40584176e-01	1.51612440e+01	-1.
	25891505e+00			
1392	2.56120904e-01	-1.61726523e-08	6.53925280e-01	-4.
	07556690e-04			
1393	1.39483133e-03	-1.52255745e+00	1.70643774e+00	-1.
	36751674e-03			
1394	-3.71914189e-02	1.46692829e-03	-6.85761415e-03	1.
	96284508e-05			
1395	1.69883036e+00	2.01632649e-03	3.12195146e-03	-1.
	02201816e-05			
1396	7.94345654e-04	3.61823605e+00	1.16331527e-02	-2.
	91066534e-03			
1397	-4.77088884e-10	-3.15357591e-10	-1.26373080e+01	-5.
	74366025e-11			
1398	-1.61014396e+01	-7.40364973e-04	-1.77156214e-05	-2.
	29277199e+00			
1399	1.04241388e-02	-1.92608701e-04	-3.56979929e-04	4.
	00847170e-04			
1400	-1.60981609e-02	3.31676579e+00	4.41155203e+00	1.
	01133696e+01			
1401	-9.50619614e-03	1.47849585e-03	1.49591044e+00	9.
	99473247e-06			
1402	-1.21087387e-07	5.43440332e-07	-8.32943455e-04	3.
	40001637e-01			
1403	1.90100172e-04	8.50404974e-05	-5.74181382e-03	2.
	89994181e+00			
1404	1.55043203e-02	6.36090878e-03	6.85681889e-07	1.
	05985391e-07			
1405	-2.85281638e-06	1.18521248e-05	1.65157287e-03	-2.
	18907342e-03			
1406	3.57945026e-04	-1.45787622e-03	5.95291717e-03	1.
	35340843e-03			

```

1407 -1.08749362e-03 2.32421420e-03 -1.47152235e-03 1.
86796363e+00
1408 -6.51698289e-02 2.24339123e-02 -7.93421883e-10 8.
90652499e-04
1409 1.75718239e-04 -2.16959090e-07 -1.86291588e-08 -3.
47880966e-11
1410 -7.31795852e-05 -9.59731899e-03 -1.32930531e-08 2.
46868832e-06
1411 -1.75232161e-06 5.56674079e-06 5.90572058e-07 3.
22091900e-07
1412 4.24755850e-02 -1.26208090e-02 -2.94730229e-05 3.
68386732e-06
1413 1.66057104e+01 1.77836252e+01 2.84475349e-01 1.
47976598e+01
1414 1.43200541e+01 2.02578019e+00 3.62747430e-08 1.
50925583e-04
1415 -2.71120681e-05 1.13039591e-06 7.18042036e-01 4.
16268953e-01
1416 -3.07382936e-04 -5.36879694e-05 -4.09727635e-04 2.
53888409e-04
1417 -6.07550028e-02 -1.65577694e-06 -2.23093339e-04 -7.
18673842e-03
1418 7.63240441e-02 2.45742602e-04 5.31358006e-05 3.
32817056e-04
1419 1.25160172e-04 -5.80806766e-06 3.66160371e-05 -3.
13656340e-11
1420 -1.30448613e+01 -1.65077653e-11 7.81266078e-07 9.
59979437e+00
1421 8.40290305e+00 -7.26070307e+00 -4.95965339e-04 -5.
06212705e-01
1422 7.68136403e-01 -6.42153907e+00 1.05860359e+01 1.
26198030e+01
1423 -3.51466597e-05 1.30012279e-01 -6.58114489e-01 8.
78858833e-01
1424 -6.63684236e-01 -1.06889661e+01 -7.29736227e+00 -1.
88474017e+01
1425 1.34654440e+00 -3.47493524e-01 -9.80450611e+00 -9.
57164689e+00
1426 -8.63129197e-01 -4.26319703e+00 7.29413877e+00 1.
35174699e+00
1427 -3.58049438e-01 -1.73838229e+00 -1.97713729e+00]
1428 norm absolute difference alpha: 0.006363639265976548
1429 norm absolute difference beta: 0.20507419277392866
1430 LogLikelihood value: 11605.796524005207
1431 Difference LogLikelihood value: -0.0338334752159426
1432 E-step duration: 0:00:03

```

```
1433 function value: 11640.045185172674 at iteration 1000
1434 function value: 11640.039866683095 at iteration 2000
1435 Optimization terminated successfully.
1436         Current function value: 11640.038901
1437         Iterations: 1585
1438         Function evaluations: 2078
1439
1440 10 largest Differences in logl according to simplex
before termination:
1441 [0.00052519 0.00052736 0.00052796 0.0005289 0.00053557
0.00053845
1442 0.00054246 0.00054264 0.00054264 0.0005432 ]
1443
1444 10 largest Differences in logl according to simplex at
termination:
1445 [0.00084018 0.00084235 0.00084294 0.00084389 0.00085056
0.00085344
1446 0.00085744 0.00085763 0.00085763 0.00085818]
1447
1448 10 largest Differences in x according to simplex before
termination:
1449 [0.06329016 0.07595068 0.0762409 0.07835787 0.07864265
0.0804974
1450 0.08171496 0.0851741 0.09013421 0.09720614]
1451
1452 10 largest Differences in x according to simplex at
termination:
1453 [0.06633439 0.07024674 0.07820273 0.07891158 0.08082041
0.0810635
1454 0.08156271 0.08344784 0.09140055 0.09417639]
1455 Finished iteration 17, duration M step 0:01:00
1456 [ 3.02459313e-03 -2.50192471e-02 -8.86447750e-01 -5.
98813397e-05
1457 -9.49820451e-01 1.20105133e-03 -1.07161033e-15 -4.
44608531e+00
1458 1.08324131e+00 -3.36658157e-04 5.39345822e-03 -2.
13131172e-04
1459 -9.02188678e-04 -2.50160798e+00 -8.69384731e-04 -8.
13459152e-02
1460 -2.20093615e-03 -1.86271145e-04 8.23573939e-09 2.
38993505e+00
1461 4.74782440e-03 -7.96013551e-07 -1.11440537e-03 2.
81270789e+01
1462 -3.16029256e-03 2.40456257e+01 1.06603777e-10 6.
42183591e+00
1463 -1.22364258e+00 3.98455169e-01 1.83661072e-03 3.
```

1463	35262734e+00				
1464	2.17409724e-13	1.59770915e+00	-3.72728371e+00	9.	
	00500075e-02				
1465	-2.87463685e+00	-1.88588365e-03	-8.62879491e-01	2.	
	76439467e-02				
1466	-2.96901569e-08	2.29429049e+00	-1.76198407e-02	1.	
	34267305e-05				
1467	-2.38795626e+00	1.28075728e-03	4.41830875e+00	-1.	
	40616776e-06				
1468	6.83536679e-05	1.73948958e+01	-9.19633397e-06	-7.	
	21003511e-13				
1469	9.92819558e+00	-6.39481595e-01	1.51693514e+01	-1.	
	25808885e+00				
1470	2.56265469e-01	-1.61874243e-08	6.50458724e-01	-4.	
	08479163e-04				
1471	1.39829645e-03	-1.51685765e+00	1.69895730e+00	-1.	
	37072315e-03				
1472	-3.70251545e-02	1.46990596e-03	-6.85061670e-03	1.	
	96707363e-05				
1473	1.69691784e+00	2.01923592e-03	3.12375027e-03	-1.	
	02301486e-05				
1474	7.95952270e-04	3.61495748e+00	1.16478644e-02	-2.	
	91420584e-03				
1475	-4.77442922e-10	-3.15615115e-10	-1.26455103e+01	-5.	
	73930172e-11				
1476	-1.61105165e+01	-7.39040073e-04	-1.77208493e-05	-2.	
	29101441e+00				
1477	1.03928369e-02	-1.92827562e-04	-3.57343555e-04	4.	
	01869359e-04				
1478	-1.60296290e-02	3.31291755e+00	4.42962155e+00	1.	
	01292134e+01				
1479	-9.47595536e-03	1.33841048e-03	1.49922248e+00	9.	
	99749380e-06				
1480	-1.21155349e-07	5.43436311e-07	-8.35362099e-04	3.	
	51273545e-01				
1481	1.92137830e-04	8.51935785e-05	-5.71991932e-03	2.	
	97054412e+00				
1482	1.54463085e-02	6.32326586e-03	6.85766844e-07	1.	
	06088543e-07				
1483	-2.85789707e-06	1.18768726e-05	1.65377675e-03	-2.	
	19176390e-03				
1484	3.58256472e-04	-1.45460404e-03	5.94989139e-03	1.	
	35590924e-03				
1485	-1.08599607e-03	2.32688758e-03	-1.47401463e-03	1.	
	86202809e+00				
1486	-6.62052488e-02	2.23429177e-02	-7.94107011e-10	8.	

```

1486 90827017e-04
1487 1.74001532e-04 -2.16966535e-07 -1.86400026e-08 -3.
     48169280e-11
1488 -7.32109719e-05 -9.69460957e-03 -1.33070466e-08 2.
     46914190e-06
1489 -1.75258363e-06 5.57694987e-06 5.91306619e-07 3.
     22476221e-07
1490 4.22477913e-02 -1.25599051e-02 -2.95279308e-05 3.
     69147472e-06
1491 1.66443757e+01 1.78228395e+01 2.79728307e-01 1.
     48253649e+01
1492 1.43845538e+01 2.02789873e+00 3.65880966e-08 1.
     51304560e-04
1493 -2.71724717e-05 1.13103159e-06 7.20656808e-01 4.
     17038910e-01
1494 -3.08121883e-04 -5.38162618e-05 -4.10719370e-04 2.
     54034345e-04
1495 -6.05233630e-02 -1.68829465e-06 -2.23613207e-04 -7.
     18063354e-03
1496 7.56726692e-02 2.46270198e-04 5.32552428e-05 3.
     32859408e-04
1497 1.25445711e-04 -5.81935374e-06 3.66970624e-05 -3.
     13936088e-11
1498 -1.30436964e+01 -1.65181296e-11 7.82226900e-07 9.
     59896363e+00
1499 8.40112390e+00 -7.25070832e+00 -4.96634599e-04 -5.
     07125387e-01
1500 7.67349405e-01 -6.41287159e+00 1.05857241e+01 1.
     26195275e+01
1501 -3.52312311e-05 1.30372529e-01 -6.58341907e-01 8.
     79207384e-01
1502 -6.63338844e-01 -1.06862738e+01 -7.28341567e+00 -1.
     88552501e+01
1503 1.34687729e+00 -3.47693499e-01 -9.80985156e+00 -9.
     57522919e+00
1504 -8.62907372e-01 -4.26300783e+00 7.29434212e+00 1.
     35143375e+00
1505 -3.57927090e-01 -1.73864266e+00 -1.97761954e+00]
1506 norm absolute difference alpha: 0.0062032139343650185
1507 norm absolute difference beta: 0.2203994530763515
1508 LogLikelihood value: 11605.760910897912
1509 Difference LogLikelihood value: -0.035613107294921065
1510 E-step duration: 0:00:03
1511 function value: 11640.006103861784 at iteration 1000
1512 function value: 11640.0007501094 at iteration 2000
1513 function value: 11639.998002589253 at iteration 3000

```

```
1514 function value: 11639.995917999606 at iteration 4000
1515 function value: 11639.992187927617 at iteration 5000
1516 Optimization terminated successfully.
1517         Current function value: 11639.991883
1518         Iterations: 4534
1519         Function evaluations: 5035
1520
1521 10 largest Differences in logl according to simplex
before termination:
1522 [0.0008479  0.00084847 0.00085086 0.00085236 0.00085348
0.00085558
1523 0.00086132 0.00086409 0.00086486 0.00087621]
1524
1525 10 largest Differences in logl according to simplex at
termination:
1526 [0.00100614 0.00100672 0.00100911 0.00101061 0.00101172
0.00101383
1527 0.00101957 0.00102234 0.00102311 0.00103446]
1528
1529 10 largest Differences in x according to simplex before
termination:
1530 [0.06723662 0.06949228 0.07281885 0.07979273 0.07999461
0.08567649
1531 0.08601902 0.09067492 0.10104872 0.1070985 ]
1532
1533 10 largest Differences in x according to simplex at
termination:
1534 [0.06635283 0.06948708 0.07723945 0.07758466 0.07919135
0.08432949
1535 0.08756312 0.0941306 0.09645629 0.09908146]
1536 Finished iteration 18, duration M step 0:02:19
1537 [ 3.07366853e-03 -2.65970726e-02 -8.85027113e-01 -5.
99128719e-05
1538 -9.82183075e-01 1.21853032e-03 -1.05830640e-15 -4.
45686257e+00
1539 1.07682279e+00 -3.36847839e-04 5.32055894e-03 -2.
12579801e-04
1540 -9.13945862e-04 -2.50659775e+00 -8.81367763e-04 -7.
97934838e-02
1541 -2.21510857e-03 -1.91088124e-04 7.71995016e-09 2.
36798955e+00
1542 4.75689324e-03 -7.93478005e-07 -1.12940743e-03 2.
81489391e+01
1543 -3.13853936e-03 2.40594980e+01 1.06762665e-10 6.
42025173e+00
1544 -1.22382898e+00 3.98550267e-01 1.83763403e-03 3.
```

1544	35306714e+00					
1545	2.17939370e-13	1.60061982e+00	-3.72939991e+00	9.		
	12648226e-02					
1546	-2.87827746e+00	-1.90907991e-03	-8.70394395e-01	2.		
	62701070e-02					
1547	-2.95206022e-08	2.29751876e+00	-1.75019771e-02	1.		
	39091628e-05					
1548	-2.39399691e+00	1.30049119e-03	4.41919852e+00	-1.		
	40598900e-06					
1549	6.88939336e-05	1.73918821e+01	-9.18821527e-06	-7.		
	15916032e-13					
1550	9.91794835e+00	-6.34364463e-01	1.51734638e+01	-1.		
	25767824e+00					
1551	2.58116111e-01	-1.60748830e-08	6.43439065e-01	-3.		
	93228195e-04					
1552	1.47630084e-03	-1.52680515e+00	1.70246657e+00	-1.		
	37774086e-03					
1553	-3.50270487e-02	1.48345017e-03	-6.85521881e-03	1.		
	96918976e-05					
1554	1.69510178e+00	2.04556018e-03	3.11969894e-03	-1.		
	01486500e-05					
1555	7.95521203e-04	3.59267402e+00	1.16795003e-02	-2.		
	91467797e-03					
1556	-4.71880043e-10	-3.15200723e-10	-1.26672419e+01	-5.		
	70554104e-11					
1557	-1.61158922e+01	-7.47246415e-04	-1.78603900e-05	-2.		
	32073399e+00					
1558	1.03360238e-02	-1.92760149e-04	-3.54501053e-04	3.		
	94915255e-04					
1559	-1.59559675e-02	3.35443624e+00	4.48969621e+00	1.		
	01605045e+01					
1560	-9.44032105e-03	1.29865247e-03	1.50197812e+00	1.		
	00342032e-05					
1561	-1.20561236e-07	5.41345045e-07	-8.35662124e-04	3.		
	84828626e-01					
1562	1.92130202e-04	8.65410774e-05	-5.41034869e-03	3.		
	04795367e+00					
1563	1.53423746e-02	6.13574130e-03	6.41291236e-07	1.		
	05306969e-07					
1564	-2.84476068e-06	1.18203685e-05	1.64824297e-03	-2.		
	19519189e-03					
1565	3.59055853e-04	-1.51987206e-03	6.53585101e-03	1.		
	37682311e-03					
1566	-1.08505047e-03	2.33872509e-03	-1.48619980e-03	1.		
	85534884e+00					
1567	-6.54349715e-02	2.02720086e-02	-7.88796570e-10	8.		

```

1567 80604917e-04
1568 1.74189801e-04 -2.17646555e-07 -1.95784925e-08 -3.
    46815455e-11
1569 -7.54377252e-05 -9.78790147e-03 -1.32199423e-08 2.
    47853832e-06
1570 -1.75652251e-06 5.55024977e-06 5.86205474e-07 3.
    19873168e-07
1571 4.03818381e-02 -1.16220458e-02 -2.95274261e-05 3.
    68203929e-06
1572 1.68211418e+01 1.79607755e+01 2.71365386e-01 1.
    49552834e+01
1573 1.45248295e+01 2.03144461e+00 3.64239677e-08 1.
    51457593e-04
1574 -2.71319929e-05 1.06944896e-06 7.46587280e-01 4.
    20710271e-01
1575 -3.16297366e-04 -5.35353941e-05 -4.08880641e-04 2.
    54668040e-04
1576 -6.01381425e-02 -1.64515733e-06 -2.25356164e-04 -7.
    20753857e-03
1577 7.47637786e-02 2.46206809e-04 5.33068695e-05 3.
    29073132e-04
1578 1.25772160e-04 -5.81662325e-06 3.67731851e-05 -3.
    18271397e-11
1579 -1.30681348e+01 -1.64197434e-11 8.26116197e-07 9.
    59593467e+00
1580 8.40270121e+00 -7.26616891e+00 -4.95152717e-04 -5.
    08732407e-01
1581 7.65413482e-01 -6.42145480e+00 1.05854170e+01 1.
    26190714e+01
1582 -3.51006625e-05 1.30748143e-01 -6.58354132e-01 8.
    79705959e-01
1583 -6.62783534e-01 -1.06935745e+01 -7.29601780e+00 -1.
    88477495e+01
1584 1.34744611e+00 -3.47753264e-01 -9.82326276e+00 -9.
    57780295e+00
1585 -8.63191706e-01 -4.26295354e+00 7.29387576e+00 1.
    35087493e+00
1586 -3.57795333e-01 -1.73884822e+00 -1.97800073e+00]
1587 norm absolute difference alpha: 0.0060343032742697
1588 norm absolute difference beta: 0.18884419059190963
1589 LogLikelihood value: 11605.679291417771
1590 Difference LogLikelihood value: -0.08161948014094378
1591 E-step duration: 0:00:03
1592 function value: 11639.950952752004 at iteration 1000
1593 function value: 11639.946102442364 at iteration 2000
1594 function value: 11639.941603228664 at iteration 3000

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```
1595 function value: 11639.93830791956 at iteration 4000
1596 function value: 11639.933589171982 at iteration 5000
1597 Optimization terminated successfully.
1598         Current function value: 11639.928663
1599         Iterations: 5398
1600         Function evaluations: 5887
1601
1602 10 largest Differences in logl according to simplex
before termination:
1603 [0.00124498 0.00124948 0.00125156 0.00125744 0.00127049
0.0012708
1604 0.00127524 0.00127911 0.0012816 0.00129694]
1605
1606 10 largest Differences in logl according to simplex at
termination:
1607 [0.00166125 0.00166576 0.00166783 0.00167371 0.00168677
0.00168707
1608 0.00169152 0.00169539 0.00169787 0.00171322]
1609
1610 10 largest Differences in x according to simplex before
termination:
1611 [0.0707623 0.07196918 0.07747166 0.08091947 0.08145225
0.08576546
1612 0.08731125 0.09234607 0.09734583 0.11072498]
1613
1614 10 largest Differences in x according to simplex at
termination:
1615 [0.07324914 0.07639082 0.0784832 0.08164408 0.08328183
0.08588232
1616 0.08593351 0.09433196 0.09475869 0.09598435]
1617 Finished iteration 19, duration M step 0:02:43
1618 [ 3.29303473e-03 -2.70638713e-02 -8.84773708e-01 -5.
92851180e-05
1619 -1.00827127e+00 1.25062019e-03 -1.13684253e-15 -4.
46792580e+00
1620 1.08585392e+00 -3.42001260e-04 4.88739522e-03 -2.
15355936e-04
1621 -9.10765923e-04 -2.51924505e+00 -9.03273829e-04 -7.
80549592e-02
1622 -2.31980863e-03 -1.87852215e-04 7.26618892e-09 2.
34680929e+00
1623 4.73808719e-03 -8.22282445e-07 -1.02203495e-03 2.
81669396e+01
1624 -3.18048894e-03 2.40820255e+01 1.04744982e-10 6.
41726903e+00
1625 -1.22391026e+00 4.00298788e-01 1.87797997e-03 3.
```

1625	35753473e+00					
1626	2.12140030e-13	1.60101048e+00	-3.73056508e+00	9.		
	21266822e-02					
1627	-2.87910099e+00	-1.95169483e-03	-8.78907820e-01	2.		
	61765129e-02					
1628	-2.93145812e-08	2.29673232e+00	-1.78359148e-02	1.		
	40137460e-05					
1629	-2.40036032e+00	1.30462359e-03	4.41534453e+00	-1.		
	41975192e-06					
1630	6.69483916e-05	1.73949178e+01	-9.24020389e-06	-6.		
	95180811e-13					
1631	9.90921161e+00	-6.36027540e-01	1.51720004e+01	-1.		
	25839845e+00					
1632	2.61098267e-01	-1.59211697e-08	6.30504965e-01	-3.		
	91927432e-04					
1633	1.50230971e-03	-1.53260000e+00	1.66231252e+00	-1.		
	40612122e-03					
1634	-3.47535529e-02	1.52717079e-03	-6.65513648e-03	1.		
	94375436e-05					
1635	1.67314977e+00	1.89836623e-03	3.04158393e-03	-1.		
	00632911e-05					
1636	8.70248599e-04	3.59833668e+00	1.16046318e-02	-2.		
	95603285e-03					
1637	-4.23437370e-10	-3.06747797e-10	-1.26512885e+01	-5.		
	61198989e-11					
1638	-1.61043582e+01	-7.49252552e-04	-1.76157656e-05	-2.		
	36324161e+00					
1639	1.04072215e-02	-1.92377493e-04	-3.58317242e-04	3.		
	98226589e-04					
1640	-1.69587633e-02	3.34888282e+00	4.57772473e+00	1.		
	02234730e+01					
1641	-9.50413307e-03	1.28290395e-03	1.50351505e+00	9.		
	83479467e-06					
1642	-1.18999492e-07	5.51866156e-07	-8.34479484e-04	4.		
	59561092e-01					
1643	1.94314759e-04	8.85711561e-05	-5.39958073e-03	3.		
	12947299e+00					
1644	1.54015007e-02	5.97501869e-03	6.29893546e-07	1.		
	04586351e-07					
1645	-2.84667208e-06	1.10024823e-05	1.65106118e-03	-2.		
	20738519e-03					
1646	3.65888153e-04	-1.66007247e-03	6.51658126e-03	1.		
	40067960e-03					
1647	-1.08785916e-03	2.36914452e-03	-1.51436740e-03	1.		
	85013702e+00					
1648	-6.36044404e-02	1.71194461e-02	-7.71551311e-10	8.		

```

1648 89296485e-04
1649 1.70181345e-04 -2.12753906e-07 -1.93736758e-08 -3.
    78953617e-11
1650 -7.46148662e-05 -1.03451000e-02 -1.31182202e-08 2.
    42250173e-06
1651 -1.72238351e-06 5.56625030e-06 6.24359489e-07 3.
    13346873e-07
1652 3.84680685e-02 -1.05905549e-02 -2.92689936e-05 3.
    68478914e-06
1653 1.69203596e+01 1.81499043e+01 2.60926961e-01 1.
    50851860e+01
1654 1.47754431e+01 2.03408932e+00 3.60391513e-08 1.
    54373897e-04
1655 -2.68692423e-05 1.06245341e-06 7.84134698e-01 4.
    24776397e-01
1656 -3.26008200e-04 -5.31428775e-05 -4.02761349e-04 2.
    42593481e-04
1657 -5.91761801e-02 -1.64837565e-06 -2.38813617e-04 -7.
    27551632e-03
1658 7.33998596e-02 2.42985997e-04 5.33042499e-05 3.
    20900858e-04
1659 1.25390711e-04 -5.84157296e-06 3.89600872e-05 -3.
    07934014e-11
1660 -1.31196810e+01 -1.59298605e-11 8.28748281e-07 9.
    59591623e+00
1661 8.40319718e+00 -7.26057591e+00 -4.95455428e-04 -5.
    10100469e-01
1662 7.64670731e-01 -6.41089688e+00 1.05847283e+01 1.
    26182534e+01
1663 -3.44450752e-05 1.31424530e-01 -6.58274845e-01 8.
    80103178e-01
1664 -6.61992255e-01 -1.06399819e+01 -7.28795886e+00 -1.
    88587888e+01
1665 1.34821544e+00 -3.48007569e-01 -9.82570644e+00 -9.
    58171475e+00
1666 -8.62994812e-01 -4.26228488e+00 7.29344018e+00 1.
    34995931e+00
1667 -3.57554437e-01 -1.73909859e+00 -1.97859325e+00]
1668 norm absolute difference alpha: 0.006584795420374987
1669 norm absolute difference beta: 0.16442394432350477
1670 LogLikelihood value: 11605.588877110433
1671 Difference LogLikelihood value: -0.09041430733850575
1672 E-step duration: 0:00:03
1673 function value: 11639.857369615345 at iteration 1000
1674 function value: 11639.851821891178 at iteration 2000
1675 function value: 11639.844944847762 at iteration 3000

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```
1676 function value: 11639.837793284845 at iteration 4000
1677 function value: 11639.82991478413 at iteration 5000
1678 function value: 11639.821452366534 at iteration 6000
1679 function value: 11639.812349118296 at iteration 7000
1680 Optimization terminated successfully.
1681         Current function value: 11639.806451
1682         Iterations: 6939
1683         Function evaluations: 7438
1684
1685 10 largest Differences in logl according to simplex
before termination:
1686 [0.00195058 0.00196108 0.00196724 0.00199437 0.00200034
0.00201105
1687 0.00201115 0.00201187 0.00202116 0.00202231]
1688
1689 10 largest Differences in logl according to simplex at
termination:
1690 [0.00289473 0.00290523 0.0029114 0.00293852 0.00294449
0.0029552
1691 0.0029553 0.00295602 0.00296531 0.00296646]
1692
1693 10 largest Differences in x according to simplex before
termination:
1694 [0.07676502 0.07903745 0.08021028 0.08197067 0.08490731
0.08949695
1695 0.09261793 0.09333824 0.10051013 0.107709 ]
1696
1697 10 largest Differences in x according to simplex at
termination:
1698 [0.07431865 0.07721385 0.07948493 0.08051805 0.08236404
0.09154873
1699 0.09176587 0.09314619 0.09744339 0.09931073]
1700 Finished iteration 20, duration M step 0:03:26
1701 [ 3.48106905e-03 -2.71404982e-02 -8.82308967e-01 -6.
75813246e-05
1702 -1.03544918e+00 1.23916729e-03 -1.11053891e-15 -4.
52508909e+00
1703 1.04430297e+00 -3.40155072e-04 4.88238371e-03 -2.
14676448e-04
1704 -9.67422329e-04 -2.51219094e+00 -9.02827729e-04 -5.
69285885e-02
1705 -2.35026641e-03 -1.85819353e-04 7.30646597e-09 2.
30633750e+00
1706 4.59021562e-03 -8.33513447e-07 -1.02894077e-03 2.
81703337e+01
1707 -3.23777229e-03 2.41082409e+01 1.05585948e-10 6.
```

1707	41769391e+00				
1708	-1.22484436e+00	4.00823649e-01	1.90899441e-03	3.	
	34505215e+00				
1709	2.22119052e-13	1.60481556e+00	-3.73873385e+00	9.	
	31497240e-02				
1710	-2.87474265e+00	-2.24536964e-03	-8.75744133e-01	2.	
	97606328e-02				
1711	-2.94413784e-08	2.29496733e+00	-1.80607992e-02	1.	
	38816238e-05				
1712	-2.40116062e+00	1.33118572e-03	4.41227929e+00	-1.	
	33605595e-06				
1713	6.44145186e-05	1.73892811e+01	-8.89447199e-06	-7.	
	24387895e-13				
1714	9.90107481e+00	-6.38076605e-01	1.51711050e+01	-1.	
	26312448e+00				
1715	2.62395601e-01	-1.60931020e-08	6.22962723e-01	-3.	
	43639033e-04				
1716	1.46114092e-03	-1.55633229e+00	1.69344646e+00	-1.	
	32852808e-03				
1717	-2.72760027e-02	1.51292454e-03	-7.71919334e-03	1.	
	89053708e-05				
1718	1.69826137e+00	1.93695670e-03	2.81503695e-03	-7.	
	91409394e-06				
1719	8.74921942e-04	3.60400664e+00	1.27743066e-02	-2.	
	93902678e-03				
1720	-4.16672618e-10	-2.79637082e-10	-1.26633294e+01	-5.	
	54881703e-11				
1721	-1.61319804e+01	-6.68654426e-04	-1.88135310e-05	-2.	
	44348402e+00				
1722	1.03291037e-02	-1.85877092e-04	-3.61643945e-04	3.	
	37028278e-04				
1723	-1.69487084e-02	3.35217537e+00	4.66852686e+00	1.	
	02354880e+01				
1724	-9.59357604e-03	1.25183314e-03	1.49512839e+00	1.	
	06850508e-05				
1725	-1.21252598e-07	5.60362484e-07	-8.18115126e-04	6.	
	91681854e-01				
1726	1.89980316e-04	8.89070423e-05	-5.38747856e-03	3.	
	21689055e+00				
1727	1.55404529e-02	4.06246157e-03	6.41476676e-07	1.	
	06353092e-07				
1728	-2.76722353e-06	1.08853786e-05	1.60611194e-03	-2.	
	13399313e-03				
1729	3.73284294e-04	-1.69420911e-03	6.81536395e-03	1.	
	26339872e-03				
1730	-1.31625378e-03	2.41696638e-03	-1.51842110e-03	1.	

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1730 84832969e+00
1731 -6.14711539e-02 1.73046468e-02 -8.19003315e-10 9.
      58982739e-04
1732 1.65206496e-04 -2.18736733e-07 -1.95985807e-08 -3.
      80542228e-11
1733 -7.25545992e-05 -1.04666635e-02 -1.32316348e-08 2.
      47647311e-06
1734 -1.55373436e-06 5.63282589e-06 7.13418231e-07 2.
      84419419e-07
1735 3.49570059e-02 -1.02353293e-02 -2.93200241e-05 3.
      57906357e-06
1736 1.70514668e+01 1.81724999e+01 2.52401979e-01 1.
      51790528e+01
1737 1.48499037e+01 2.03685147e+00 3.63996459e-08 1.
      49846534e-04
1738 -2.64774758e-05 1.07433216e-06 8.07617189e-01 4.
      33269458e-01
1739 -3.20935232e-04 -5.23892368e-05 -4.02810197e-04 2.
      30466873e-04
1740 -5.83879242e-02 -1.83178107e-06 -2.29940998e-04 -7.
      55708551e-03
1741 6.87579026e-02 2.44708907e-04 5.34168754e-05 3.
      28598576e-04
1742 1.39981993e-04 -6.82462502e-06 3.88577718e-05 -3.
      00792948e-11
1743 -1.31837117e+01 -1.59988929e-11 6.50885395e-07 9.
      59481610e+00
1744 8.40028068e+00 -7.26170117e+00 -5.41550713e-04 -5.
      11052829e-01
1745 7.63863610e-01 -6.41566321e+00 1.05842933e+01 1.
      26178365e+01
1746 -3.84718616e-05 1.31999679e-01 -6.58487118e-01 8.
      80261393e-01
1747 -6.61378200e-01 -1.07212523e+01 -7.28887386e+00 -1.
      88117300e+01
1748 1.34871356e+00 -3.48186164e-01 -9.80034605e+00 -9.
      59051447e+00
1749 -8.62802849e-01 -4.26221959e+00 7.29304475e+00 1.
      35007999e+00
1750 -3.57360597e-01 -1.73919677e+00 -1.97904141e+00]
1751 norm absolute difference alpha: 0.005100454318323519
1752 norm absolute difference beta: 0.24078929391233744
1753 LogLikelihood value: 11605.456817823735
1754 Difference LogLikelihood value: -0.13205928669776767
1755 breakpoint
1756 E-step duration: 0:00:03

```

```

1757 function value: 11639.678544984608 at iteration 1000
1758 function value: 11639.669935122793 at iteration 2000
1759 function value: 11639.660524052782 at iteration 3000
1760 function value: 11639.651062178506 at iteration 4000
1761 function value: 11639.642579354779 at iteration 5000
1762 function value: 11639.634538939967 at iteration 6000
1763 function value: 11639.629124140316 at iteration 7000
1764 function value: 11639.625416806783 at iteration 8000
1765 Optimization terminated successfully.
1766             Current function value: 11639.624147
1767             Iterations: 7808
1768             Function evaluations: 8322
1769
1770 10 largest Differences in logl according to simplex
before termination:
1771 [0.00072964 0.00073116 0.00073205 0.00073641 0.0007382
0.00073999
1772 0.00074039 0.00074108 0.00074151 0.00074225]
1773
1774 10 largest Differences in logl according to simplex at
termination:
1775 [0.00100092 0.00100244 0.00100332 0.00100769 0.00100948
0.00101127
1776 0.00101167 0.00101235 0.00101278 0.00101353]
1777
1778 10 largest Differences in x according to simplex before
termination:
1779 [0.07657039 0.07671814 0.07865216 0.08194013 0.08382046
0.08583613
1780 0.09727884 0.0998916 0.10447749 0.1085617 ]
1781
1782 10 largest Differences in x according to simplex at
termination:
1783 [0.07185521 0.07349381 0.07949548 0.07958547 0.07971803
0.08143141
1784 0.08151206 0.08885076 0.08886818 0.0949804 ]
1785 Finished iteration 21, duration M step 0:03:49
1786 [ 3.30308055e-03 -2.70220666e-02 -8.81117142e-01 -6.
76264309e-05
1787 -1.05347513e+00 1.20389037e-03 -9.08672739e-16 -4.
52975910e+00
1788 1.04714649e+00 -3.43643837e-04 4.70013648e-03 -1.
84103392e-04
1789 -9.57895789e-04 -2.51549770e+00 -8.62219263e-04 -5.
65914675e-02
1790 -2.32401094e-03 -1.95436514e-04 8.34122697e-09 2.

```

1790	29372802e+00				
1791	4.55085953e-03	-7.73809418e-07	-1.07780608e-03	2.	
	81959251e+01				
1792	-3.21319249e-03	2.41234737e+01	1.06340911e-10	6.	
	41406286e+00				
1793	-1.22438240e+00	4.00215983e-01	1.90336034e-03	3.	
	34833256e+00				
1794	2.15818111e-13	1.60511478e+00	-3.73314630e+00	9.	
	37989750e-02				
1795	-2.88240167e+00	-2.55733971e-03	-8.81783243e-01	2.	
	62813331e-02				
1796	-3.02891512e-08	2.30121476e+00	-1.76523781e-02	1.	
	30977086e-05				
1797	-2.40385903e+00	1.31201927e-03	4.42032951e+00	-1.	
	30535634e-06				
1798	5.72485271e-05	1.74107076e+01	-8.88686848e-06	-7.	
	56767054e-13				
1799	9.88408109e+00	-6.38687119e-01	1.51670439e+01	-1.	
	26383957e+00				
1800	2.63081545e-01	-1.62314064e-08	6.16199469e-01	-4.	
	10452439e-04				
1801	1.31354245e-03	-1.55490965e+00	1.69918756e+00	-1.	
	41613857e-03				
1802	-2.65239457e-02	1.26349910e-03	-7.10930315e-03	1.	
	88726777e-05				
1803	1.70878535e+00	1.99350070e-03	2.80653098e-03	-7.	
	89197618e-06				
1804	8.21782808e-04	3.61446453e+00	1.13720886e-02	-2.	
	92559615e-03				
1805	-4.30188549e-10	-2.85357341e-10	-1.26509960e+01	-5.	
	59709263e-11				
1806	-1.61149846e+01	-6.76702286e-04	-1.81358912e-05	-2.	
	47742568e+00				
1807	1.00202522e-02	-1.90560920e-04	-3.83415045e-04	3.	
	36742393e-04				
1808	-2.03308805e-02	3.35743200e+00	4.72181471e+00	1.	
	02524677e+01				
1809	-9.41333405e-03	1.22014744e-03	1.48107474e+00	1.	
	04246427e-05				
1810	-1.24136748e-07	6.60147536e-07	-8.24984206e-04	1.	
	06593798e+00				
1811	1.84985637e-04	8.48444674e-05	-5.23897068e-03	3.	
	31724885e+00				
1812	1.44542717e-02	4.01348781e-03	6.32272760e-07	1.	
	19652192e-07				
1813	-2.76374888e-06	1.09599296e-05	1.47378373e-03	-2.	

```

1813 12111990e-03
1814 4.20232598e-04 -1.64253805e-03 6.93784109e-03 1.
21064008e-03
1815 -1.34148043e-03 2.40280495e-03 -1.46714421e-03 1.
85569535e+00
1816 -5.48738609e-02 1.42197538e-02 -7.93096552e-10 1.
11491320e-03
1817 1.61157318e-04 -1.78978513e-07 -1.97244400e-08 -3.
60872219e-11
1818 -7.12418640e-05 -1.05829778e-02 -1.35008787e-08 2.
39665315e-06
1819 -1.72463589e-06 4.91966061e-06 7.11250582e-07 2.
49372437e-07
1820 3.24722393e-02 -9.76205737e-03 -2.96324661e-05 3.
59987046e-06
1821 1.70686860e+01 1.82139644e+01 2.55318165e-01 1.
51694707e+01
1822 1.48950336e+01 2.03917015e+00 3.46893299e-08 1.
51136761e-04
1823 -2.72431348e-05 9.16770097e-07 8.68597058e-01 4.
73755335e-01
1824 -3.77729200e-04 -5.24787771e-05 -4.43753381e-04 2.
35221306e-04
1825 -6.45552844e-02 -1.91326067e-06 -2.24798068e-04 -7.
67050411e-03
1826 6.43740479e-02 2.43992860e-04 5.40788249e-05 3.
04057905e-04
1827 1.42321197e-04 -7.35198779e-06 3.90823837e-05 -2.
91105013e-11
1828 -1.31698430e+01 -1.59558803e-11 6.54224620e-07 9.
59482905e+00
1829 8.39944917e+00 -7.26273701e+00 -5.47591750e-04 -5.
10961183e-01
1830 7.62314645e-01 -6.42263384e+00 1.05842996e+01 1.
26176647e+01
1831 -4.04148252e-05 1.32263459e-01 -6.58065750e-01 8.
80399076e-01
1832 -6.61498627e-01 -1.06784668e+01 -7.28029395e+00 -1.
88011892e+01
1833 1.34918549e+00 -3.48063252e-01 -9.78734460e+00 -9.
55866567e+00
1834 -8.62756053e-01 -4.26216589e+00 7.29269623e+00 1.
34931963e+00
1835 -3.57489699e-01 -1.73937431e+00 -1.97845760e+00]
1836 norm absolute difference alpha: 0.005716710715153099
1837 norm absolute difference beta: 0.4266792405788696

```

```
1838 LogLikelihood value: 11605.315370860559
1839 Difference LogLikelihood value: -0.14144696317634953
1840 E-step duration: 0:00:03
1841 function value: 11639.339000768123 at iteration 1000
1842 function value: 11639.32873549415 at iteration 2000
1843 function value: 11639.318431657997 at iteration 3000
1844 function value: 11639.310683299133 at iteration 4000
1845 function value: 11639.304374666308 at iteration 5000
1846 function value: 11639.301004139015 at iteration 6000
1847 Optimization terminated successfully.
1848     Current function value: 11639.298662
1849     Iterations: 5934
1850     Function evaluations: 6415
1851
1852 10 largest Differences in logl according to simplex
before termination:
1853 [0.00110504 0.00111505 0.0011182 0.00111901 0.00112304
0.00112363
1854 0.00112376 0.0011248 0.00112837 0.00113048]
1855
1856 10 largest Differences in logl according to simplex at
termination:
1857 [0.00125748 0.0012675 0.00127065 0.00127145 0.00127549
0.00127608
1858 0.0012762 0.00127724 0.00128081 0.00128293]
1859
1860 10 largest Differences in x according to simplex before
termination:
1861 [0.07917025 0.07946935 0.07993848 0.08824124 0.08866905
0.09189204
1862 0.09207941 0.0987263 0.09947321 0.12177533]
1863
1864 10 largest Differences in x according to simplex at
termination:
1865 [0.07903936 0.08043918 0.0838132 0.08525625 0.09570294
0.09630126
1866 0.09639431 0.09674669 0.09772076 0.09953467]
1867 Finished iteration 22, duration M step 0:02:57
1868 [ 3.41161971e-03 -2.72397304e-02 -8.80763999e-01 -6.
77167752e-05
1869 -1.06764600e+00 1.21257080e-03 -8.93565071e-16 -4.
53103522e+00
1870 1.05555301e+00 -3.45830264e-04 5.14102251e-03 -1.
84705854e-04
1871 -9.54716222e-04 -2.51908946e+00 -8.61565432e-04 -5.
57428310e-02
```

1872	-2.31631187e-03	-1.96210620e-04	7.48801829e-09	2.
	29904585e+00			
1873	4.69890723e-03	-7.60934048e-07	-1.08524999e-03	2.
	81912660e+01			
1874	-3.12356240e-03	2.41285896e+01	1.03919325e-10	6.
	41408112e+00			
1875	-1.22455549e+00	4.00892036e-01	2.07620584e-03	3.
	34851672e+00			
1876	2.11316208e-13	1.60397418e+00	-3.73739197e+00	9.
	26248382e-02			
1877	-2.88579276e+00	-2.54522675e-03	-8.86803230e-01	2.
	76375301e-02			
1878	-2.93831665e-08	2.30448378e+00	-1.78454515e-02	1.
	31264442e-05			
1879	-2.40882817e+00	1.32115556e-03	4.42376652e+00	-1.
	30747027e-06			
1880	5.68634277e-05	1.74245297e+01	-8.33044910e-06	-7.
	46722209e-13			
1881	9.88405244e+00	-6.39060501e-01	1.51647414e+01	-1.
	26398459e+00			
1882	2.62401720e-01	-1.58767181e-08	6.16751953e-01	-4.
	07756520e-04			
1883	1.30740483e-03	-1.54396710e+00	1.69876388e+00	-1.
	40798753e-03			
1884	-2.64845570e-02	1.36598372e-03	-7.05588415e-03	1.
	89188363e-05			
1885	1.71119649e+00	1.99220069e-03	2.77855210e-03	-7.
	18590989e-06			
1886	8.22344691e-04	3.61695282e+00	1.17142114e-02	-3.
	12301881e-03			
1887	-4.23429872e-10	-3.13117957e-10	-1.26612611e+01	-5.
	50877078e-11			
1888	-1.61178633e+01	-6.76929851e-04	-1.80318619e-05	-2.
	48148530e+00			
1889	1.00386596e-02	-1.84900593e-04	-3.89600592e-04	3.
	38086531e-04			
1890	-2.01898419e-02	3.30647224e+00	4.73493886e+00	1.
	03198159e+01			
1891	-9.36019631e-03	1.19053609e-03	1.47290485e+00	9.
	95478500e-06			
1892	-1.21881635e-07	6.51023121e-07	-8.02144726e-04	1.
	36637556e+00			
1893	1.85665822e-04	8.45614144e-05	-5.25824077e-03	3.
	33993743e+00			
1894	1.46909363e-02	3.93192885e-03	6.24395926e-07	1.
	24643633e-07			

1895	-3.38126552e-06	1.09634668e-05	1.36075812e-03	-2.
	06906530e-03			
1896	4.16595966e-04	-1.65601606e-03	6.98399755e-03	1.
	21269411e-03			
1897	-1.43185275e-03	2.39440871e-03	-1.46852137e-03	1.
	86247074e+00			
1898	-5.06025883e-02	1.39463792e-02	-7.82842215e-10	1.
	12594719e-03			
1899	1.59722140e-04	-1.75804609e-07	-2.15096546e-08	-3.
	41084847e-11			
1900	-7.09485570e-05	-1.03721806e-02	-1.32506732e-08	2.
	38074653e-06			
1901	-1.70860887e-06	4.96139973e-06	6.93639490e-07	2.
	43636147e-07			
1902	2.73122928e-02	-9.84309215e-03	-2.97833871e-05	3.
	61078614e-06			
1903	1.70907269e+01	1.82510050e+01	2.49148507e-01	1.
	52033075e+01			
1904	1.49140007e+01	2.04105914e+00	3.40565216e-08	1.
	46437712e-04			
1905	-2.70129970e-05	9.25474256e-07	9.20493076e-01	5.
	16769829e-01			
1906	-3.77106902e-04	-5.20384901e-05	-4.42796261e-04	2.
	33340468e-04			
1907	-6.35231387e-02	-1.99393084e-06	-2.23053117e-04	-7.
	75205061e-03			
1908	5.87495221e-02	2.29764553e-04	5.40748897e-05	3.
	03477404e-04			
1909	1.46823429e-04	-6.95962223e-06	3.89020022e-05	-2.
	88380524e-11			
1910	-1.31922955e+01	-1.56773753e-11	6.56572523e-07	9.
	59385852e+00			
1911	8.39932898e+00	-7.27745918e+00	-5.43409956e-04	-5.
	10558662e-01			
1912	7.62032321e-01	-6.42384289e+00	1.05842282e+01	1.
	26173965e+01			
1913	-4.06851367e-05	1.32272409e-01	-6.58077408e-01	8.
	80450903e-01			
1914	-6.60909185e-01	-1.06605955e+01	-7.29098487e+00	-1.
	88189335e+01			
1915	1.34883722e+00	-3.47919528e-01	-9.81992299e+00	-9.
	58140960e+00			
1916	-8.62628018e-01	-4.26208228e+00	7.29292745e+00	1.
	34940393e+00			
1917	-3.57545757e-01	-1.73934015e+00	-1.97820676e+00]	
1918	norm absolute difference alpha:	0.007376756316090425		

```

1919 norm absolute difference beta: 0.6156658344809083
1920 LogLikelihood value: 11605.200450504966
1921 Difference LogLikelihood value: -0.11492035559240321
1922 E-step duration: 0:00:03
1923 function value: 11639.15755023385 at iteration 1000
1924 function value: 11639.145991509336 at iteration 2000
1925 function value: 11639.139140729396 at iteration 3000
1926 function value: 11639.133110805738 at iteration 4000
1927 function value: 11639.129192234723 at iteration 5000
1928 function value: 11639.127206063044 at iteration 6000
1929 function value: 11639.123569381883 at iteration 7000
1930 Optimization terminated successfully.
1931             Current function value: 11639.121336
1932             Iterations: 7256
1933             Function evaluations: 7751
1934
1935 10 largest Differences in logl according to simplex
before termination:
1936 [0.00083511 0.00083574 0.00083722 0.00084397 0.00084398
 0.00084464
1937 0.00084502 0.00084562 0.00084607 0.00084748]
1938
1939 10 largest Differences in logl according to simplex at
termination:
1940 [0.0010835 0.00108413 0.00108561 0.00109236 0.00109237
 0.00109303
1941 0.00109342 0.00109402 0.00109447 0.00109587]
1942
1943 10 largest Differences in x according to simplex before
termination:
1944 [0.07279687 0.07510084 0.07515485 0.08003396 0.08622056
 0.08957946
1945 0.09159894 0.09423167 0.09432896 0.12956259]
1946
1947 10 largest Differences in x according to simplex at
termination:
1948 [0.07378148 0.07478584 0.07868299 0.08760281 0.08977382
 0.09053853
1949 0.09089011 0.0932104 0.09632896 0.09824953]
1950 Finished iteration 23, duration M step 0:03:33
1951 [ 3.40586483e-03 -2.75418911e-02 -8.80890539e-01 -6.
 98874755e-05
1952 -1.09044277e+00 1.20259118e-03 -8.76762793e-16 -4.
 52363155e+00
1953 1.07229133e+00 -3.48881294e-04 5.29162075e-03 -1.
 86562186e-04

```

1954	-9.57994989e-04	-2.51966643e+00	-8.55408501e-04	-5.
	28578135e-02			
1955	-2.30088778e-03	-1.97870868e-04	7.42111104e-09	2.
	30130072e+00			
1956	4.45708282e-03	-7.94354190e-07	-1.03325781e-03	2.
	82143200e+01			
1957	-3.08573312e-03	2.41415378e+01	1.02885645e-10	6.
	41471195e+00			
1958	-1.22478686e+00	4.01236856e-01	2.00482686e-03	3.
	35047236e+00			
1959	2.08040672e-13	1.60464438e+00	-3.74343818e+00	7.
	87919637e-02			
1960	-2.89090665e+00	-2.51918752e-03	-8.71692009e-01	2.
	77580945e-02			
1961	-2.90450920e-08	2.31134307e+00	-1.80093445e-02	1.
	42434828e-05			
1962	-2.41447986e+00	1.31781408e-03	4.43232294e+00	-1.
	32846214e-06			
1963	5.76582387e-05	1.74026083e+01	-8.27776324e-06	-7.
	89461988e-13			
1964	9.88599453e+00	-6.37340873e-01	1.51608052e+01	-1.
	26362530e+00			
1965	2.64782489e-01	-1.58040839e-08	6.22796605e-01	-3.
	80389018e-04			
1966	1.39483749e-03	-1.56368382e+00	1.70218215e+00	-1.
	43106192e-03			
1967	-2.64531525e-02	1.23813491e-03	-7.13972090e-03	1.
	94960359e-05			
1968	1.72874526e+00	1.97896967e-03	2.74804538e-03	-7.
	47715031e-06			
1969	8.32268305e-04	3.60473376e+00	1.21732110e-02	-2.
	81614029e-03			
1970	-4.19230412e-10	-3.08206801e-10	-1.26469473e+01	-5.
	36909807e-11			
1971	-1.61224339e+01	-7.42590858e-04	-1.77058299e-05	-2.
	50151155e+00			
1972	9.97999758e-03	-1.80910765e-04	-3.84474324e-04	3.
	40231501e-04			
1973	-2.01832055e-02	3.29496214e+00	4.79669521e+00	1.
	03744701e+01			
1974	-8.82967306e-03	1.10555704e-03	1.46438973e+00	9.
	58462805e-06			
1975	-1.33148598e-07	6.97877173e-07	-7.90975486e-04	1.
	65289513e+00			
1976	1.86604680e-04	9.01128590e-05	-5.24623332e-03	3.
	37517786e+00			

1977	1.46280507e-02	3.84090794e-03	6.04484585e-07	1.
	24288005e-07			
1978	-3.32827111e-06	1.10584383e-05	1.33083691e-03	-2.
	05197104e-03			
1979	4.12009339e-04	-1.65762367e-03	7.40067022e-03	1.
	19941679e-03			
1980	-1.44166866e-03	2.37697299e-03	-1.49699042e-03	1.
	87129936e+00			
1981	-4.47108271e-02	1.36841467e-02	-7.68258773e-10	1.
	10218552e-03			
1982	1.56399378e-04	-1.52615706e-07	-2.13988498e-08	-3.
	47780928e-11			
1983	-6.89968902e-05	-1.03755122e-02	-1.31781497e-08	2.
	30830366e-06			
1984	-1.75628776e-06	4.81816387e-06	7.02239786e-07	2.
	45143420e-07			
1985	2.61948874e-02	-9.68638904e-03	-3.16758998e-05	3.
	89371317e-06			
1986	1.71069459e+01	1.83286338e+01	2.38448446e-01	1.
	51982777e+01			
1987	1.49588999e+01	2.04111005e+00	3.33558176e-08	1.
	49654718e-04			
1988	-2.77263893e-05	9.10812584e-07	9.74067704e-01	5.
	83991554e-01			
1989	-3.77893153e-04	-5.32128283e-05	-4.49146801e-04	2.
	27537708e-04			
1990	-6.37055660e-02	-1.83925258e-06	-2.28037157e-04	-7.
	80484242e-03			
1991	6.24881733e-02	2.33126520e-04	5.25883114e-05	2.
	95553806e-04			
1992	1.50483136e-04	-6.90914175e-06	4.02809369e-05	-2.
	67544646e-11			
1993	-1.32969702e+01	-1.53842697e-11	6.63353180e-07	9.
	58746972e+00			
1994	8.38505312e+00	-7.29072147e+00	-5.71418864e-04	-5.
	10503352e-01			
1995	7.62747112e-01	-6.42804187e+00	1.05836178e+01	1.
	26172105e+01			
1996	-4.10108097e-05	1.32198272e-01	-6.58008166e-01	8.
	80571144e-01			
1997	-6.60783819e-01	-1.06925745e+01	-7.32194906e+00	-1.
	87987236e+01			
1998	1.34871964e+00	-3.47822552e-01	-9.82062058e+00	-9.
	58157820e+00			
1999	-8.62517275e-01	-4.26177203e+00	7.29273548e+00	1.
	34959548e+00			

```

2000 -3.57438720e-01 -1.73953473e+00 -1.97909341e+00]
2001 norm absolute difference alpha: 0.006409370137908541
2002 norm absolute difference beta: 0.48874729815110923
2003 LogLikelihood value: 11605.08536184524
2004 Difference LogLikelihood value: -0.11508865972609783
2005 E-step duration: 0:00:03
2006 function value: 11638.92054612826 at iteration 1000
2007 function value: 11638.90771459837 at iteration 2000
2008 function value: 11638.902805600546 at iteration 3000
2009 function value: 11638.898897301822 at iteration 4000
2010 function value: 11638.896592151832 at iteration 5000
2011 Optimization terminated successfully.
2012 Current function value: 11638.894671
2013 Iterations: 4919
2014 Function evaluations: 5404
2015
2016 10 largest Differences in logl according to simplex
before termination:
2017 [0.00085637 0.00085955 0.0008639 0.00086432 0.00086673
0.00086696
2018 0.00086732 0.00086926 0.00086983 0.00087171]
2019
2020 10 largest Differences in logl according to simplex at
termination:
2021 [0.0012216 0.00122478 0.00122913 0.00122955 0.00123196
0.00123219
2022 0.00123255 0.00123449 0.00123506 0.00123694]
2023
2024 10 largest Differences in x according to simplex before
termination:
2025 [0.07748628 0.07762484 0.08243752 0.08564983 0.0936068
0.09775048
2026 0.09775586 0.0981704 0.09868874 0.11340922]
2027
2028 10 largest Differences in x according to simplex at
termination:
2029 [0.07246714 0.07460592 0.0806919 0.08361282 0.08412081
0.084473
2030 0.0879395 0.09648898 0.09660275 0.09698799]
2031 Finished iteration 24, duration M step 0:02:31
2032 [ 3.42563717e-03 -2.77748984e-02 -8.80109137e-01 -7.
01103230e-05
2033 -1.10456574e+00 1.21346605e-03 -8.65070670e-16 -4.
52738487e+00
2034 1.05986565e+00 -3.44950724e-04 5.29802358e-03 -1.
87403915e-04

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2035	-9.92452828e-04	-2.51975089e+00	-8.19668780e-04	-5.
	29421935e-02			
2036	-2.31566635e-03	-1.98922670e-04	7.38552564e-09	2.
	30052540e+00			
2037	4.45722035e-03	-7.53073105e-07	-1.02742264e-03	2.
	82368495e+01			
2038	-3.08476026e-03	2.41512779e+01	1.02399925e-10	6.
	41476001e+00			
2039	-1.22502484e+00	4.01925816e-01	2.00856498e-03	3.
	35212193e+00			
2040	2.04413694e-13	1.60430641e+00	-3.74524610e+00	7.
	86443937e-02			
2041	-2.89117814e+00	-2.54158955e-03	-8.77985007e-01	2.
	79716524e-02			
2042	-2.88635641e-08	2.31137675e+00	-1.91304841e-02	1.
	45168619e-05			
2043	-2.41904778e+00	1.33578197e-03	4.42264402e+00	-1.
	34425215e-06			
2044	5.44858454e-05	1.74188674e+01	-8.38148872e-06	-7.
	72154777e-13			
2045	9.88385956e+00	-6.37114075e-01	1.51652128e+01	-1.
	26391510e+00			
2046	2.66020665e-01	-1.57450633e-08	6.25355146e-01	-3.
	81150775e-04			
2047	1.39582122e-03	-1.55690144e+00	1.68823056e+00	-1.
	43288482e-03			
2048	-2.53954319e-02	1.22509070e-03	-7.17708122e-03	1.
	95820069e-05			
2049	1.72124195e+00	1.98683933e-03	2.77285712e-03	-7.
	44995837e-06			
2050	8.37464201e-04	3.61782683e+00	1.21498698e-02	-2.
	81622756e-03			
2051	-4.10213184e-10	-3.03371266e-10	-1.26652613e+01	-5.
	26290584e-11			
2052	-1.61103323e+01	-7.42183612e-04	-1.75569252e-05	-2.
	51698535e+00			
2053	1.00999478e-02	-1.80510251e-04	-3.85332588e-04	3.
	42316661e-04			
2054	-2.03484880e-02	3.27498215e+00	4.83072136e+00	1.
	04146392e+01			
2055	-9.13627363e-03	1.03742122e-03	1.45976476e+00	9.
	19202139e-06			
2056	-1.32004666e-07	6.87614656e-07	-7.86913210e-04	1.
	87464559e+00			
2057	1.87289078e-04	9.07969835e-05	-5.30898218e-03	3.
	37256621e+00			

2058	1.46907400e-02	3.85617566e-03	6.01732173e-07	1.
	28668719e-07			
2059	-3.36663919e-06	1.11749807e-05	1.32443267e-03	-2.
	03883967e-03			
2060	4.04807297e-04	-1.64804095e-03	7.44108895e-03	1.
	24563984e-03			
2061	-1.45601887e-03	2.40057575e-03	-1.50733836e-03	1.
	87422389e+00			
2062	-4.19441763e-02	1.36863298e-02	-7.57291468e-10	1.
	10379958e-03			
2063	1.56752179e-04	-1.51027069e-07	-2.13029018e-08	-3.
	46681110e-11			
2064	-7.27754065e-05	-1.04405738e-02	-1.31904727e-08	2.
	30361171e-06			
2065	-1.75000003e-06	4.86321593e-06	6.83482002e-07	2.
	46626997e-07			
2066	2.57456890e-02	-9.68330482e-03	-3.18031130e-05	3.
	57481561e-06			
2067	1.71546178e+01	1.83995890e+01	2.26782709e-01	1.
	52259038e+01			
2068	1.49974850e+01	2.04058374e+00	3.27618428e-08	1.
	49708826e-04			
2069	-2.77777991e-05	9.01061133e-07	1.01606445e+00	6.
	15580699e-01			
2070	-3.73637557e-04	-5.48430860e-05	-4.50677878e-04	2.
	27972538e-04			
2071	-6.38605581e-02	-1.88862937e-06	-2.25848937e-04	-7.
	80712576e-03			
2072	6.29127718e-02	2.34087608e-04	4.92971963e-05	2.
	97286473e-04			
2073	1.50903233e-04	-7.07367245e-06	4.02445969e-05	-2.
	71700941e-11			
2074	-1.33158751e+01	-1.50335399e-11	6.65254844e-07	9.
	58653564e+00			
2075	8.38766984e+00	-7.30025011e+00	-5.72841052e-04	-5.
	11069697e-01			
2076	7.59772583e-01	-6.41263744e+00	1.05837118e+01	1.
	26171356e+01			
2077	-4.12505078e-05	1.32411877e-01	-6.57932914e-01	8.
	80819552e-01			
2078	-6.60991282e-01	-1.07073353e+01	-7.29645332e+00	-1.
	88030296e+01			
2079	1.34865586e+00	-3.48009522e-01	-9.80272951e+00	-9.
	58354840e+00			
2080	-8.62403730e-01	-4.26174307e+00	7.29261823e+00	1.
	34947149e+00			

```
2081 -3.57337751e-01 -1.73961636e+00 -1.97898384e+00]
2082 norm absolute difference alpha: 0.0066471578615593776
2083 norm absolute difference beta: 0.4020160091023839
2084 LogLikelihood value: 11605.002918250293
2085 Difference LogLikelihood value: -0.08244359494710807
2086 E-step duration: 0:00:03
2087 function value: 11638.779415921066 at iteration 1000
2088 function value: 11638.770176617172 at iteration 2000
2089 function value: 11638.76585831514 at iteration 3000
2090 function value: 11638.763352407384 at iteration 4000
2091 function value: 11638.761512613193 at iteration 5000
2092 Optimization terminated successfully.
2093             Current function value: 11638.760421
2094             Iterations: 4604
2095             Function evaluations: 5094
2096
2097 10 largest Differences in logl according to simplex
before termination:
2098 [0.00082201 0.00082266 0.00082803 0.00083012 0.00083336
0.00083666
2099 0.0008367 0.00084155 0.00084341 0.00084547]
2100
2101 10 largest Differences in logl according to simplex at
termination:
2102 [0.00088518 0.00088583 0.00089121 0.00089329 0.00089654
0.00089983
2103 0.00089988 0.00090472 0.00090658 0.00090864]
2104
2105 10 largest Differences in x according to simplex before
termination:
2106 [0.0719586 0.0756836 0.08296239 0.08349457 0.0850599
0.0885741
2107 0.08956432 0.10050939 0.10286169 0.10898162]
2108
2109 10 largest Differences in x according to simplex at
termination:
2110 [0.06927928 0.07308683 0.08143409 0.08560447 0.08609014
0.08647431
2111 0.09051766 0.09329476 0.0938806 0.09699645]
2112 Finished iteration 25, duration M step 0:02:21
2113 [ 3.43510086e-03 -2.78472630e-02 -8.79661932e-01 -7.
15192722e-05
2114 -1.11441303e+00 1.21486707e-03 -8.44180869e-16 -4.
52859930e+00
2115 1.06170431e+00 -3.44061545e-04 5.34154146e-03 -1.
86787347e-04
```

2116	-9.93818755e-04	-2.51592007e+00	-8.22949774e-04	-5.
	29013750e-02			
2117	-2.30945709e-03	-1.98026392e-04	7.37530083e-09	2.
	28336103e+00			
2118	4.42010460e-03	-7.60365602e-07	-1.02826068e-03	2.
	82456941e+01			
2119	-3.22922081e-03	2.41557049e+01	1.02457089e-10	6.
	41627043e+00			
2120	-1.22544704e+00	4.02448859e-01	2.02215890e-03	3.
	35251068e+00			
2121	2.14866359e-13	1.60605458e+00	-3.74782554e+00	7.
	91978014e-02			
2122	-2.89594272e+00	-2.53477173e-03	-8.75620654e-01	2.
	81113415e-02			
2123	-2.88388691e-08	2.31108496e+00	-2.00002248e-02	1.
	47608687e-05			
2124	-2.40405819e+00	1.34898626e-03	4.43025788e+00	-1.
	36323036e-06			
2125	5.46268412e-05	1.74382159e+01	-8.35407585e-06	-7.
	70416807e-13			
2126	9.88143891e+00	-6.39262202e-01	1.51661839e+01	-1.
	26495343e+00			
2127	2.68170821e-01	-1.57804505e-08	6.17458383e-01	-3.
	81857521e-04			
2128	1.39406694e-03	-1.56179922e+00	1.68522811e+00	-1.
	42929809e-03			
2129	-2.44908556e-02	1.22863849e-03	-7.24221593e-03	1.
	97239868e-05			
2130	1.72519376e+00	2.02449564e-03	2.76555966e-03	-7.
	43804619e-06			
2131	8.32927748e-04	3.61106738e+00	1.20746185e-02	-2.
	80244495e-03			
2132	-4.11466154e-10	-3.02183589e-10	-1.26665628e+01	-5.
	24536699e-11			
2133	-1.61025682e+01	-7.48081685e-04	-1.74486845e-05	-2.
	53612530e+00			
2134	1.01845609e-02	-1.81711913e-04	-3.83887199e-04	3.
	41805855e-04			
2135	-2.05075418e-02	3.25479339e+00	4.85914720e+00	1.
	04549795e+01			
2136	-9.23360156e-03	9.83806173e-04	1.45672644e+00	9.
	14094224e-06			
2137	-1.31676015e-07	6.77007653e-07	-7.84160395e-04	2.
	06292655e+00			
2138	1.91754318e-04	9.10560187e-05	-5.33659940e-03	3.
	37300923e+00			

2139	1.48075589e-02	3.85502683e-03	5.95536890e-07	1.
	29200419e-07			
2140	-3.19033557e-06	1.13100627e-05	1.32182273e-03	-2.
	04481708e-03			
2141	4.03554189e-04	-1.66568527e-03	7.49889141e-03	1.
	24952759e-03			
2142	-1.47592449e-03	2.36089772e-03	-1.47272484e-03	1.
	87477562e+00			
2143	-4.00796954e-02	1.29495372e-02	-7.31495562e-10	1.
	11049661e-03			
2144	1.55497453e-04	-1.49569131e-07	-2.13479930e-08	-3.
	47150563e-11			
2145	-7.22562178e-05	-1.05372958e-02	-1.32349742e-08	2.
	28765449e-06			
2146	-1.67956752e-06	4.89399404e-06	6.85462672e-07	2.
	57598202e-07			
2147	2.53166301e-02	-9.70315793e-03	-3.16469164e-05	3.
	63612573e-06			
2148	1.71991299e+01	1.84406623e+01	2.17681287e-01	1.
	52534849e+01			
2149	1.50439418e+01	2.04098796e+00	3.22974568e-08	1.
	49473747e-04			
2150	-2.71891777e-05	8.93951990e-07	1.04984281e+00	6.
	41548172e-01			
2151	-3.74665224e-04	-5.52788095e-05	-4.49344644e-04	2.
	26382063e-04			
2152	-6.38948170e-02	-1.89529788e-06	-2.26232753e-04	-7.
	86492621e-03			
2153	6.28944361e-02	2.39240558e-04	4.51744777e-05	2.
	95033008e-04			
2154	1.50770098e-04	-7.18837153e-06	4.09213375e-05	-2.
	70880091e-11			
2155	-1.33398612e+01	-1.47554521e-11	6.66378750e-07	9.
	58599983e+00			
2156	8.38747825e+00	-7.28508285e+00	-5.68479853e-04	-5.
	12011963e-01			
2157	7.59701980e-01	-6.42308115e+00	1.05832537e+01	1.
	26169592e+01			
2158	-4.11504737e-05	1.32548799e-01	-6.58006981e-01	8.
	80832899e-01			
2159	-6.60926602e-01	-1.06955781e+01	-7.29572286e+00	-1.
	88304039e+01			
2160	1.34943039e+00	-3.48187697e-01	-9.80882987e+00	-9.
	60646868e+00			
2161	-8.62228968e-01	-4.26138169e+00	7.29298668e+00	1.
	34936522e+00			

```
2162 -3.57290139e-01 -1.73948017e+00 -1.97923597e+00]
2163 norm absolute difference alpha: 0.0077417452661406195
2164 norm absolute difference beta: 0.3560937080845661
2165 LogLikelihood value: 11604.931390217713
2166 Difference LogLikelihood value: -0.07152803258031781
2167 E-step duration: 0:00:03
2168 function value: 11638.6484037591 at iteration 1000
2169 function value: 11638.638582994881 at iteration 2000
2170 function value: 11638.635773391614 at iteration 3000
2171 function value: 11638.633680626586 at iteration 4000
2172 Optimization terminated successfully.
2173             Current function value: 11638.631981
2174             Iterations: 3886
2175             Function evaluations: 4384
2176
2177 10 largest Differences in logl according to simplex
before termination:
2178 [0.00077304 0.00077653 0.0007813 0.00078301 0.00078422
0.00078734
2179 0.00078941 0.00080024 0.00080048 0.00080091]
2180
2181 10 largest Differences in logl according to simplex at
termination:
2182 [0.0010607 0.00106419 0.00106895 0.00107066 0.00107187
0.00107499
2183 0.00107707 0.0010879 0.00108813 0.00108856]
2184
2185 10 largest Differences in x according to simplex before
termination:
2186 [0.07110376 0.07587831 0.08002499 0.08087372 0.08101753
0.08635993
2187 0.08667231 0.09726643 0.1014409 0.107672 ]
2188
2189 10 largest Differences in x according to simplex at
termination:
2190 [0.07044013 0.07378667 0.07395746 0.07734173 0.08358375
0.08423364
2191 0.08725321 0.08965496 0.09296466 0.09943518]
2192 Finished iteration 26, duration M step 0:02:03
2193 [ 3.43426795e-03 -2.81269800e-02 -8.79548028e-01 -7.
17036798e-05
2194 -1.12229870e+00 1.21807970e-03 -8.46156735e-16 -4.
53477047e+00
2195 1.05469791e+00 -3.42993705e-04 5.45810245e-03 -1.
79994464e-04
2196 -9.96541444e-04 -2.51405918e+00 -8.22885068e-04 -5.
```

2196	28799263e-02				
2197	-2.32522369e-03	-1.96891102e-04	7.36959642e-09	2.	
	28500483e+00				
2198	4.45317676e-03	-7.64246036e-07	-1.03378413e-03	2.	
	82614758e+01				
2199	-3.25087335e-03	2.41628453e+01	1.06388548e-10	6.	
	41593575e+00				
2200	-1.22551706e+00	4.02704616e-01	2.03251885e-03	3.	
	35040813e+00				
2201	2.15015242e-13	1.60741443e+00	-3.74912789e+00	7.	
	96902798e-02				
2202	-2.89824477e+00	-2.55300127e-03	-8.81419760e-01	2.	
	80561718e-02				
2203	-2.87438772e-08	2.31017384e+00	-2.00333603e-02	1.	
	51351525e-05				
2204	-2.40814563e+00	1.35093691e-03	4.43019354e+00	-1.	
	36076930e-06				
2205	5.47286039e-05	1.74231218e+01	-8.30836635e-06	-7.	
	69084244e-13				
2206	9.88094085e+00	-6.37711955e-01	1.51685895e+01	-1.	
	26711965e+00				
2207	2.69876104e-01	-1.57041578e-08	6.16702361e-01	-3.	
	82057325e-04				
2208	1.43266366e-03	-1.55715703e+00	1.68515979e+00	-1.	
	43158217e-03				
2209	-2.44870721e-02	1.23428524e-03	-7.26096436e-03	1.	
	96745791e-05				
2210	1.71550206e+00	2.02207589e-03	2.79041674e-03	-7.	
	39859220e-06				
2211	8.30904328e-04	3.60761695e+00	1.20992898e-02	-2.	
	53895595e-03				
2212	-4.11128846e-10	-3.01675569e-10	-1.26710556e+01	-5.	
	25342751e-11				
2213	-1.61219557e+01	-7.51706657e-04	-1.73711749e-05	-2.	
	55558256e+00				
2214	1.01810512e-02	-1.83391180e-04	-3.73739278e-04	3.	
	40828174e-04				
2215	-2.08853981e-02	3.22644971e+00	4.89417210e+00	1.	
	04667430e+01				
2216	-9.25142888e-03	9.91949211e-04	1.45399561e+00	9.	
	15537957e-06				
2217	-1.31553722e-07	6.79236534e-07	-7.93888759e-04	2.	
	22720357e+00				
2218	1.91218027e-04	9.13048404e-05	-5.24000741e-03	3.	
	37141731e+00				
2219	1.48075631e-02	3.83060759e-03	6.19585153e-07	1.	

2219	28437762e-07				
2220	-3.17481355e-06	1.12878196e-05	1.33653823e-03	-2.	
	06644394e-03				
2221	4.06836691e-04	-1.67266037e-03	7.52372701e-03	1.	
	25382734e-03				
2222	-1.47835948e-03	2.37802721e-03	-1.47668639e-03	1.	
	87262247e+00				
2223	-3.86000596e-02	1.32611215e-02	-7.31992317e-10	1.	
	11586762e-03				
2224	1.56346375e-04	-1.50637251e-07	-2.12658755e-08	-3.	
	47352372e-11				
2225	-7.26301548e-05	-1.06383685e-02	-1.33055321e-08	2.	
	29257629e-06				
2226	-1.68567544e-06	4.78485132e-06	6.80392222e-07	2.	
	55762573e-07				
2227	2.35051134e-02	-9.65637994e-03	-3.15573477e-05	3.	
	63031232e-06				
2228	1.72603377e+01	1.85009757e+01	2.07693600e-01	1.	
	52755656e+01				
2229	1.51016768e+01	2.04205449e+00	3.23528277e-08	1.	
	49024216e-04				
2230	-2.71037427e-05	8.62466352e-07	1.07704126e+00	6.	
	72726549e-01				
2231	-3.76432204e-04	-5.53785021e-05	-4.48901317e-04	2.	
	26638960e-04				
2232	-6.36240159e-02	-1.87335833e-06	-2.26867104e-04	-7.	
	89363421e-03				
2233	6.25082404e-02	2.38723691e-04	4.50581717e-05	2.	
	95116153e-04				
2234	1.50317624e-04	-7.14672134e-06	4.14579862e-05	-2.	
	64053225e-11				
2235	-1.34127897e+01	-1.44085169e-11	6.60685758e-07	9.	
	58730103e+00				
2236	8.38032858e+00	-7.27573258e+00	-5.69937026e-04	-5.	
	13074430e-01				
2237	7.58499178e-01	-6.42688273e+00	1.05830932e+01	1.	
	26167516e+01				
2238	-4.08617417e-05	1.32669752e-01	-6.58305237e-01	8.	
	81088838e-01				
2239	-6.60665348e-01	-1.06886550e+01	-7.28663597e+00	-1.	
	88089491e+01				
2240	1.34945093e+00	-3.48203120e-01	-9.82449847e+00	-9.	
	57408612e+00				
2241	-8.62092022e-01	-4.26132361e+00	7.29295651e+00	1.	
	34935264e+00				
2242	-3.57258430e-01	-1.73950613e+00	-1.97935520e+00]		

```
2243 norm absolute difference alpha: 0.006755867808046574
2244 norm absolute difference beta: 0.31407395382092546
2245 LogLikelihood value: 11604.867722800056
2246 Difference LogLikelihood value: -0.06366741765668849
2247 E-step duration: 0:00:03
2248 function value: 11638.508999618038 at iteration 1000
2249 function value: 11638.499620075083 at iteration 2000
2250 function value: 11638.49778309594 at iteration 3000
2251 Optimization terminated successfully.
2252             Current function value: 11638.496872
2253             Iterations: 2589
2254             Function evaluations: 3082
2255
2256 10 largest Differences in logl according to simplex
before termination:
2257 [0.00067637 0.00067897 0.00068461 0.0006848 0.00068681
0.00068759
2258 0.00069434 0.00069472 0.00069566 0.00070354]
2259
2260 10 largest Differences in logl according to simplex at
termination:
2261 [0.00083007 0.00083267 0.00083831 0.0008385 0.00084051
0.00084129
2262 0.00084804 0.00084842 0.00084936 0.00085724]
2263
2264 10 largest Differences in x according to simplex before
termination:
2265 [0.07181457 0.07307996 0.07403958 0.07596949 0.08099496
0.08141613
2266 0.08904386 0.09990356 0.10333895 0.10837325]
2267
2268 10 largest Differences in x according to simplex at
termination:
2269 [0.07167258 0.07435574 0.07589237 0.07629817 0.07944558
0.08083967
2270 0.09493726 0.09664966 0.09873827 0.09957078]
2271 Finished iteration 27, duration M step 0:01:27
2272 [ 3.43410304e-03 -2.81588452e-02 -8.79168418e-01 -7.
16773625e-05
2273 -1.12330231e+00 1.21792327e-03 -8.45180123e-16 -4.
53866418e+00
2274 1.04857156e+00 -3.45946742e-04 5.46297216e-03 -1.
80433321e-04
2275 -9.96634955e-04 -2.51406861e+00 -8.24192246e-04 -5.
27877429e-02
2276 -2.32522324e-03 -1.97622836e-04 7.35552192e-09 2.
```

2276	27753714e+00				
2277	4.46293746e-03	-7.63958962e-07	-1.03352740e-03	2.	
	82776748e+01				
2278	-3.24413326e-03	2.41681605e+01	1.06211356e-10	6.	
	41405434e+00				
2279	-1.22545284e+00	4.02918166e-01	2.02865983e-03	3.	
	34893921e+00				
2280	2.14821242e-13	1.60986740e+00	-3.75182898e+00	7.	
	99185554e-02				
2281	-2.89831522e+00	-2.55307787e-03	-8.82604226e-01	2.	
	80454383e-02				
2282	-2.86890850e-08	2.30890953e+00	-2.00571357e-02	1.	
	49061122e-05				
2283	-2.40785922e+00	1.35336566e-03	4.42778307e+00	-1.	
	35955909e-06				
2284	5.53788016e-05	1.74204897e+01	-8.31742926e-06	-7.	
	68334813e-13				
2285	9.87778125e+00	-6.36947405e-01	1.51707381e+01	-1.	
	26846601e+00				
2286	2.70457273e-01	-1.56932813e-08	6.12768132e-01	-3.	
	85587183e-04				
2287	1.44632680e-03	-1.55111091e+00	1.68141814e+00	-1.	
	44853733e-03				
2288	-2.44901204e-02	1.23584574e-03	-7.26711616e-03	1.	
	96588237e-05				
2289	1.71194918e+00	2.02305342e-03	2.79275843e-03	-7.	
	39543732e-06				
2290	8.34672004e-04	3.61070523e+00	1.22446660e-02	-2.	
	54431629e-03				
2291	-4.10375122e-10	-3.01149565e-10	-1.26693370e+01	-5.	
	24875115e-11				
2292	-1.61239400e+01	-7.52409280e-04	-1.74107140e-05	-2.	
	58195872e+00				
2293	1.01999448e-02	-1.83686912e-04	-3.73236317e-04	3.	
	43822933e-04				
2294	-2.08099477e-02	3.20174054e+00	4.91770525e+00	1.	
	04911865e+01				
2295	-9.26315813e-03	9.92123427e-04	1.45270339e+00	9.	
	02052774e-06				
2296	-1.31411809e-07	6.78857645e-07	-7.96016372e-04	2.	
	36128247e+00				
2297	1.92650818e-04	9.14259027e-05	-5.14751897e-03	3.	
	37299156e+00				
2298	1.47979026e-02	3.81760064e-03	6.19697913e-07	1.	
	28389107e-07				
2299	-3.17787403e-06	1.12764459e-05	1.34029581e-03	-2.	

2299	07246279e-03			
2300	4.06303439e-04	-1.67019680e-03	7.52895415e-03	1.
	26898367e-03			
2301	-1.48125235e-03	2.37907002e-03	-1.47843388e-03	1.
	86846283e+00			
2302	-3.81464650e-02	1.32156089e-02	-7.31122078e-10	1.
	11613674e-03			
2303	1.56657712e-04	-1.50601132e-07	-2.14973987e-08	-3.
	47003440e-11			
2304	-7.27606488e-05	-1.06920819e-02	-1.33008412e-08	2.
	29304387e-06			
2305	-1.68585089e-06	4.71862395e-06	6.80386043e-07	2.
	55653928e-07			
2306	2.32198561e-02	-9.63793794e-03	-3.17757133e-05	3.
	62669827e-06			
2307	1.72974442e+01	1.85515289e+01	2.01705476e-01	1.
	53035062e+01			
2308	1.51903294e+01	2.04242051e+00	3.23307022e-08	1.
	50478796e-04			
2309	-2.71450640e-05	8.61778872e-07	1.09364833e+00	6.
	98882654e-01			
2310	-3.80845898e-04	-5.53991489e-05	-4.43252603e-04	2.
	27064326e-04			
2311	-6.34476759e-02	-1.87332722e-06	-2.05882079e-04	-7.
	89876205e-03			
2312	6.23614484e-02	2.38529629e-04	4.50544678e-05	2.
	95714568e-04			
2313	1.50618519e-04	-7.15230865e-06	4.15217087e-05	-2.
	63797127e-11			
2314	-1.34311915e+01	-1.43924031e-11	6.60999946e-07	9.
	58812384e+00			
2315	8.37906834e+00	-7.27494378e+00	-5.70751433e-04	-5.
	13801636e-01			
2316	7.57462420e-01	-6.42752842e+00	1.05828940e+01	1.
	26167754e+01			
2317	-4.10843042e-05	1.32494218e-01	-6.58444102e-01	8.
	81385699e-01			
2318	-6.60525899e-01	-1.06834820e+01	-7.28699295e+00	-1.
	88411992e+01			
2319	1.34936809e+00	-3.48335022e-01	-9.81289849e+00	-9.
	55972052e+00			
2320	-8.62160412e-01	-4.26118197e+00	7.29303586e+00	1.
	34911751e+00			
2321	-3.57184702e-01	-1.73941127e+00	-1.97918747e+00]	
2322	norm absolute difference alpha:	0.006709974338150821		
2323	norm absolute difference beta:	0.2657411028226995		

```
2324 LogLikelihood value: 11604.815111475014
2325 Difference LogLikelihood value: -0.05261132504165289
2326 E-step duration: 0:00:02
2327 function value: 11638.373419073163 at iteration 1000
2328 function value: 11638.36577453652 at iteration 2000
2329 function value: 11638.363126899903 at iteration 3000
2330 function value: 11638.360855234801 at iteration 4000
2331 Optimization terminated successfully.
2332 Current function value: 11638.358377
2333 Iterations: 4060
2334 Function evaluations: 4565
2335
2336 10 largest Differences in logl according to simplex
before termination:
2337 [0.00087353 0.00087461 0.00087599 0.00087753 0.00088089
0.00088862
2338 0.00088931 0.00089215 0.00089303 0.00089336]
2339
2340 10 largest Differences in logl according to simplex at
termination:
2341 [0.00089041 0.00089149 0.00089287 0.0008944 0.00089777
0.0009055
2342 0.00090618 0.00090902 0.0009099 0.00091024]
2343
2344 10 largest Differences in x according to simplex before
termination:
2345 [0.07030092 0.07068691 0.07335795 0.07861793 0.08382391
0.08650803
2346 0.08709224 0.09358062 0.09568059 0.10281766]
2347
2348 10 largest Differences in x according to simplex at
termination:
2349 [0.072093 0.07285021 0.07521683 0.080167 0.08186329
0.0844937
2350 0.09133769 0.0933507 0.09484763 0.09705291]
2351 Finished iteration 28, duration M step 0:02:07
2352 [ 3.46079602e-03 -2.80756196e-02 -8.78850143e-01 -7.
24869537e-05
2353 -1.13248087e+00 1.22548864e-03 -9.49690845e-16 -4.
54118422e+00
2354 1.04210923e+00 -3.47378191e-04 5.56008451e-03 -1.
72094536e-04
2355 -1.03377155e-03 -2.51884051e+00 -8.28318428e-04 -4.
97268481e-02
2356 -2.33454270e-03 -1.91809821e-04 7.36479327e-09 2.
27467033e+00
```

2357	4.41260989e-03	-7.53830966e-07	-1.03457411e-03	2.
	82919450e+01			
2358	-3.28448173e-03	2.41686709e+01	1.05162950e-10	6.
	41188980e+00			
2359	-1.22536924e+00	4.03218206e-01	2.05075254e-03	3.
	35194171e+00			
2360	2.12387494e-13	1.61091585e+00	-3.75093449e+00	7.
	98942492e-02			
2361	-2.90031574e+00	-2.58577825e-03	-8.83785280e-01	2.
	79229159e-02			
2362	-2.87320607e-08	2.30922666e+00	-1.82038470e-02	1.
	49937633e-05			
2363	-2.41206356e+00	1.34982173e-03	4.42950100e+00	-1.
	36792512e-06			
2364	5.56114091e-05	1.74231052e+01	-8.34904683e-06	-7.
	73805143e-13			
2365	9.87369188e+00	-6.41211382e-01	1.51759683e+01	-1.
	26957295e+00			
2366	2.73034808e-01	-1.57503473e-08	6.07817979e-01	-4.
	10677686e-04			
2367	1.45154660e-03	-1.55390845e+00	1.68517338e+00	-1.
	44470357e-03			
2368	-2.43447516e-02	1.23888453e-03	-7.43521813e-03	1.
	98859554e-05			
2369	1.71597927e+00	2.03451219e-03	2.81425943e-03	-7.
	41289233e-06			
2370	8.41509781e-04	3.61160201e+00	1.16868141e-02	-2.
	54130764e-03			
2371	-4.02555421e-10	-3.01746820e-10	-1.26796186e+01	-5.
	13872402e-11			
2372	-1.61393460e+01	-7.66177109e-04	-1.71390862e-05	-2.
	62817331e+00			
2373	1.01772233e-02	-1.83426242e-04	-3.77730144e-04	3.
	43462028e-04			
2374	-2.06811812e-02	3.18155295e+00	4.96236910e+00	1.
	05112316e+01			
2375	-9.74195049e-03	9.88686488e-04	1.45121381e+00	8.
	88446089e-06			
2376	-1.28720528e-07	6.66037928e-07	-7.95879137e-04	2.
	50153194e+00			
2377	1.92515999e-04	8.93017772e-05	-5.13043368e-03	3.
	36752782e+00			
2378	1.47576680e-02	3.82563858e-03	6.12098836e-07	1.
	28511502e-07			
2379	-3.18675411e-06	1.13470271e-05	1.33936694e-03	-2.
	07387387e-03			

2380	4.18462152e-04	-1.66288073e-03	7.53086979e-03	1.
	27883053e-03			
2381	-1.47186178e-03	2.39039122e-03	-1.48701628e-03	1.
	86798358e+00			
2382	-3.65961388e-02	1.25041412e-02	-7.26024029e-10	1.
	13039304e-03			
2383	1.55585859e-04	-1.47836245e-07	-2.12131913e-08	-3.
	47557334e-11			
2384	-7.18015998e-05	-1.08424131e-02	-1.32907623e-08	2.
	26883198e-06			
2385	-1.60516935e-06	4.72633175e-06	6.82354801e-07	2.
	56521626e-07			
2386	2.28321698e-02	-9.52850433e-03	-3.19611990e-05	3.
	77204521e-06			
2387	1.73714799e+01	1.86495812e+01	1.78667806e-01	1.
	53687491e+01			
2388	1.52419359e+01	2.04126509e+00	3.16972178e-08	1.
	50882346e-04			
2389	-2.74524974e-05	8.43554025e-07	1.13065245e+00	7.
	44702055e-01			
2390	-3.81997635e-04	-5.59980435e-05	-4.50793735e-04	2.
	26183551e-04			
2391	-6.27176327e-02	-1.87802903e-06	-2.06275136e-04	-8.
	04000401e-03			
2392	6.24894432e-02	2.41058331e-04	4.55969980e-05	2.
	91921682e-04			
2393	1.53450737e-04	-7.17540466e-06	4.20460711e-05	-2.
	54394470e-11			
2394	-1.34676051e+01	-1.40902647e-11	6.72528897e-07	9.
	58824168e+00			
2395	8.37956456e+00	-7.28686511e+00	-5.73181776e-04	-5.
	15148602e-01			
2396	7.56945318e-01	-6.43645123e+00	1.05827852e+01	1.
	26164096e+01			
2397	-4.16645858e-05	1.32613565e-01	-6.58399830e-01	8.
	81535494e-01			
2398	-6.60329191e-01	-1.06908731e+01	-7.29649023e+00	-1.
	88605936e+01			
2399	1.34952936e+00	-3.48459409e-01	-9.84247789e+00	-9.
	58629174e+00			
2400	-8.62211256e-01	-4.26113607e+00	7.29297468e+00	1.
	34893316e+00			
2401	-3.57109985e-01	-1.73956978e+00	-1.97954231e+00]	
2402	norm absolute difference alpha:	0.005909959324641955		
2403	norm absolute difference beta:	0.2316987304272541		
2404	LogLikelihood value:	11604.742563538774		

```
2405 Difference LogLikelihood value: -0.07254793624088052
2406 E-step duration: 0:00:02
2407 function value: 11638.213927540199 at iteration 1000
2408 function value: 11638.206933377187 at iteration 2000
2409 function value: 11638.20492286851 at iteration 3000
2410 function value: 11638.202095403694 at iteration 4000
2411 Optimization terminated successfully.
2412             Current function value: 11638.201525
2413             Iterations: 3653
2414             Function evaluations: 4161
2415
2416 10 largest Differences in logl according to simplex
before termination:
2417 [0.00071726 0.00072255 0.00072985 0.00073156 0.00073291
0.00073616
2418 0.00073863 0.00073914 0.00074031 0.00074192]
2419
2420 10 largest Differences in logl according to simplex at
termination:
2421 [0.0008391 0.00084439 0.00085169 0.0008534 0.00085475
0.000858
2422 0.00086047 0.00086098 0.00086214 0.00086376]
2423
2424 10 largest Differences in x according to simplex before
termination:
2425 [0.07305515 0.07617698 0.08036503 0.0827565 0.08604946
0.08799804
2426 0.09104764 0.09375495 0.10187194 0.10635489]
2427
2428 10 largest Differences in x according to simplex at
termination:
2429 [0.07761171 0.07918984 0.08104244 0.08322806 0.08678282
0.08760046
2430 0.09190379 0.09232891 0.09515039 0.09766189]
2431 Finished iteration 29, duration M step 0:01:56
2432 [ 3.35335244e-03 -2.80397231e-02 -8.78427353e-01 -7.
28051834e-05
2433 -1.13218177e+00 1.22919358e-03 -9.26992306e-16 -4.
53781797e+00
2434 1.02851156e+00 -3.50878194e-04 5.59920394e-03 -1.
73365048e-04
2435 -1.03691581e-03 -2.51832102e+00 -8.33309861e-04 -4.
94296897e-02
2436 -2.35169293e-03 -1.94260561e-04 7.33590183e-09 2.
25984332e+00
2437 4.39741976e-03 -7.45084954e-07 -1.03805431e-03 2.
```

2437	83119248e+01				
2438	-3.31985314e-03	2.41728291e+01	1.04753739e-10	6.	
	41229947e+00				
2439	-1.22546575e+00	4.03464902e-01	2.07405724e-03	3.	
	34817503e+00				
2440	2.30340484e-13	1.61447135e+00	-3.75526274e+00	8.	
	03281546e-02				
2441	-2.90271527e+00	-2.60379901e-03	-8.82394478e-01	2.	
	78799405e-02				
2442	-2.85749493e-08	2.31116388e+00	-1.82555672e-02	1.	
	50405201e-05				
2443	-2.41000316e+00	1.34614403e-03	4.42352854e+00	-1.	
	37414504e-06				
2444	5.62989983e-05	1.74300376e+01	-8.14661136e-06	-7.	
	70804304e-13				
2445	9.87203289e+00	-6.44743355e-01	1.51730416e+01	-1.	
	27034335e+00				
2446	2.73184392e-01	-1.57371285e-08	6.11483850e-01	-4.	
	13567851e-04				
2447	1.35501103e-03	-1.54677697e+00	1.67411035e+00	-1.	
	46077948e-03				
2448	-2.42318153e-02	1.24712432e-03	-7.48179530e-03	2.	
	00125525e-05				
2449	1.70573264e+00	2.04882794e-03	2.84256923e-03	-7.	
	40419676e-06				
2450	8.48851778e-04	3.60682796e+00	1.16606749e-02	-2.	
	54013537e-03				
2451	-4.01048054e-10	-3.00522530e-10	-1.26663364e+01	-5.	
	11723746e-11				
2452	-1.61343669e+01	-7.71751302e-04	-1.70377456e-05	-2.	
	65328158e+00				
2453	1.03133270e-02	-1.83749422e-04	-3.81427583e-04	3.	
	46715850e-04				
2454	-2.06327791e-02	3.18029126e+00	4.99675210e+00	1.	
	05346435e+01				
2455	-9.71008206e-03	9.87912048e-04	1.44878773e+00	8.	
	83291445e-06				
2456	-1.25494139e-07	6.58418016e-07	-7.96895779e-04	2.	
	63806870e+00				
2457	1.92049673e-04	8.95566717e-05	-5.12070588e-03	3.	
	36892109e+00				
2458	1.47224980e-02	3.81186798e-03	6.07786050e-07	1.	
	30825839e-07				
2459	-3.20262128e-06	1.13933291e-05	1.33947984e-03	-2.	
	07832435e-03				
2460	4.23163683e-04	-1.65848292e-03	7.57607858e-03	1.	

```

2460 28225559e-03
2461 -1.42852053e-03 2.40740225e-03 -1.49083406e-03 1.
     86636042e+00
2462 -3.56293923e-02 1.19755420e-02 -7.23463144e-10 1.
     12341632e-03
2463 1.48702499e-04 -1.45591264e-07 -2.21638701e-08 -3.
     46240170e-11
2464 -7.15006374e-05 -1.09790774e-02 -1.29972515e-08 2.
     25952758e-06
2465 -1.59567518e-06 4.75964642e-06 7.03592355e-07 2.
     56625470e-07
2466 2.14753486e-02 -9.47504330e-03 -3.22643859e-05 3.
     79294292e-06
2467 1.74433295e+01 1.87340849e+01 1.71873300e-01 1.
     54158019e+01
2468 1.53483606e+01 2.03987628e+00 3.13204675e-08 1.
     52502451e-04
2469 -2.75803626e-05 7.88494385e-07 1.15414476e+00 7.
     91090206e-01
2470 -3.84441498e-04 -5.62255942e-05 -4.54493106e-04 2.
     25130812e-04
2471 -6.25231652e-02 -1.89267406e-06 -2.07796666e-04 -8.
     10033586e-03
2472 6.21465536e-02 2.42396181e-04 4.57896837e-05 2.
     89088074e-04
2473 1.54460341e-04 -7.19318325e-06 4.22765028e-05 -2.
     53548508e-11
2474 -1.35290529e+01 -1.40419661e-11 6.75907344e-07 9.
     58667115e+00
2475 8.37885347e+00 -7.27575268e+00 -5.77150719e-04 -5.
     15834917e-01
2476 7.55704067e-01 -6.41673341e+00 1.05825509e+01 1.
     26163671e+01
2477 -4.33419177e-05 1.32595252e-01 -6.58280220e-01 8.
     81920437e-01
2478 -6.59788026e-01 -1.06933294e+01 -7.28116618e+00 -1.
     88636145e+01
2479 1.34981755e+00 -3.48637886e-01 -9.82466935e+00 -9.
     56304723e+00
2480 -8.62124905e-01 -4.26088315e+00 7.29308662e+00 1.
     34862394e+00
2481 -3.56933321e-01 -1.73971595e+00 -1.97903281e+00]
2482 norm absolute difference alpha: 0.006374785565525741
2483 norm absolute difference beta: 0.2017995697934897
2484 LogLikelihood value: 11604.690078798993
2485 Difference LogLikelihood value: -0.05248473978099355

```

```
2486 E-step duration: 0:00:03
2487 function value: 11638.051079155093 at iteration 1000
2488 function value: 11638.042754222024 at iteration 2000
2489 function value: 11638.039042266226 at iteration 3000
2490 function value: 11638.035659310983 at iteration 4000
2491 Optimization terminated successfully.
2492         Current function value: 11638.033041
2493         Iterations: 3933
2494         Function evaluations: 4426
2495
2496 10 largest Differences in logl according to simplex
before termination:
2497 [0.00107826 0.00108059 0.00108062 0.00108579 0.00109038
0.00109087
2498 0.00109288 0.00110223 0.00111218 0.00112145]
2499
2500 10 largest Differences in logl according to simplex at
termination:
2501 [0.00130661 0.00130895 0.00130898 0.00131414 0.00131873
0.00131922
2502 0.00132123 0.00133058 0.00134053 0.00134981]
2503
2504 10 largest Differences in x according to simplex before
termination:
2505 [0.08183762 0.08256585 0.08469914 0.08500815 0.08536753
0.08554705
2506 0.08945891 0.09591478 0.09596036 0.10334147]
2507
2508 10 largest Differences in x according to simplex at
termination:
2509 [0.08133265 0.08172276 0.08253656 0.08297772 0.08326952
0.08760568
2510 0.09090997 0.09157179 0.09946524 0.09973438]
2511 Finished iteration 30, duration M step 0:02:03
2512 [ 3.32864081e-03 -2.79515911e-02 -8.77957620e-01 -7.
36049982e-05
2513 -1.13789456e+00 1.22071001e-03 -9.33947344e-16 -4.
54155083e+00
2514 1.02281159e+00 -3.50661091e-04 5.77856666e-03 -1.
73067243e-04
2515 -1.03033935e-03 -2.51522920e+00 -8.29384539e-04 -4.
87538233e-02
2516 -2.33949597e-03 -1.93912869e-04 7.38824020e-09 2.
24474078e+00
2517 4.38999228e-03 -7.44511865e-07 -1.03113817e-03 2.
83163396e+01
```

2518	-3.27851274e-03	2.41859226e+01	1.05484360e-10	6.
	41325231e+00			
2519	-1.22522491e+00	4.03897229e-01	2.04968566e-03	3.
	35226471e+00			
2520	2.32299596e-13	1.61722916e+00	-3.75131306e+00	8.
	05274407e-02			
2521	-2.90272909e+00	-2.49925064e-03	-8.82599557e-01	2.
	75965751e-02			
2522	-3.00403143e-08	2.30720480e+00	-1.82581018e-02	1.
	51599224e-05			
2523	-2.40795376e+00	1.36193040e-03	4.42026448e+00	-1.
	41316943e-06			
2524	5.61846811e-05	1.74152622e+01	-8.18557612e-06	-7.
	79753994e-13			
2525	9.86969963e+00	-6.48661577e-01	1.51878936e+01	-1.
	27222797e+00			
2526	2.72935768e-01	-1.59517167e-08	6.06319054e-01	-4.
	16050822e-04			
2527	1.35263446e-03	-1.54269008e+00	1.67952412e+00	-1.
	45736761e-03			
2528	-2.40015387e-02	1.24019579e-03	-7.46173477e-03	2.
	04259467e-05			
2529	1.71105229e+00	2.03918484e-03	2.80899475e-03	-7.
	07399723e-06			
2530	8.75150791e-04	3.60440447e+00	1.16795482e-02	-2.
	54599944e-03			
2531	-4.19821866e-10	-3.01165470e-10	-1.26623540e+01	-5.
	14925502e-11			
2532	-1.61351426e+01	-7.69325228e-04	-1.70381947e-05	-2.
	67738683e+00			
2533	1.02760339e-02	-1.76202292e-04	-3.76617407e-04	3.
	46538689e-04			
2534	-2.05151938e-02	3.10537870e+00	5.04836402e+00	1.
	05593410e+01			
2535	-9.67914616e-03	9.88757295e-04	1.44216758e+00	8.
	81377713e-06			
2536	-1.25556973e-07	6.58518985e-07	-8.00090118e-04	2.
	82576344e+00			
2537	1.91611674e-04	8.90936559e-05	-5.06898450e-03	3.
	38699674e+00			
2538	1.46890597e-02	3.58919195e-03	6.07545949e-07	1.
	33048295e-07			
2539	-3.21456897e-06	1.14945271e-05	1.40735777e-03	-2.
	10045577e-03			
2540	4.18899671e-04	-1.63326965e-03	7.55942434e-03	1.
	27761960e-03			

```

2541 -1.42822707e-03 2.39361163e-03 -1.48391409e-03 1.
     86660081e+00
2542 -3.18656817e-02 1.15311849e-02 -7.28417296e-10 1.
     16939104e-03
2543 1.48728963e-04 -1.45449912e-07 -2.24357803e-08 -3.
     48365341e-11
2544 -7.13668762e-05 -1.11750702e-02 -1.26003632e-08 2.
     25131179e-06
2545 -1.67941648e-06 4.71305791e-06 7.11324770e-07 2.
     58487225e-07
2546 2.09574687e-02 -9.64344703e-03 -3.07226987e-05 3.
     86226240e-06
2547 1.75229123e+01 1.88270646e+01 1.62023480e-01 1.
     54665065e+01
2548 1.54214887e+01 2.03857079e+00 3.13353744e-08 1.
     52360582e-04
2549 -2.76845284e-05 7.89037864e-07 1.18941348e+00 8.
     77898700e-01
2550 -3.82688600e-04 -5.13427166e-05 -4.56571409e-04 2.
     24911062e-04
2551 -6.16606470e-02 -1.84147742e-06 -2.06768739e-04 -8.
     03785498e-03
2552 6.07649171e-02 2.45758238e-04 4.63595503e-05 2.
     88366656e-04
2553 1.54268575e-04 -7.23371955e-06 4.01166307e-05 -2.
     55666094e-11
2554 -1.35720607e+01 -1.48145267e-11 6.81168164e-07 9.
     59043536e+00
2555 8.37838549e+00 -7.28163013e+00 -6.00918008e-04 -5.
     16409632e-01
2556 7.55418574e-01 -6.42520981e+00 1.05822123e+01 1.
     26159786e+01
2557 -4.32704515e-05 1.32902741e-01 -6.58533454e-01 8.
     82234600e-01
2558 -6.60050960e-01 -1.06853579e+01 -7.28467013e+00 -1.
     88514815e+01
2559 1.34999544e+00 -3.48809121e-01 -9.80015133e+00 -9.
     56112507e+00
2560 -8.62337937e-01 -4.26060299e+00 7.29261866e+00 1.
     34889327e+00
2561 -3.56751028e-01 -1.74000657e+00 -1.97963833e+00]
2562 norm absolute difference alpha: 0.00564584409871193
2563 norm absolute difference beta: 0.1722308642743156
2564 LogLikelihood value: 11604.623821748968
2565 Difference LogLikelihood value: -0.06625705002443283
2566 E-step duration: 0:00:03

```

```
2567 function value: 11637.803114207116 at iteration 1000
2568 function value: 11637.795342688307 at iteration 2000
2569 function value: 11637.789087364019 at iteration 3000
2570 Optimization terminated successfully.
2571         Current function value: 11637.787780
2572         Iterations: 2601
2573         Function evaluations: 3085
2574
2575 10 largest Differences in logl according to simplex
before termination:
2576 [0.00141673 0.001433 0.00143892 0.00144349 0.00145074
0.00146926
2577 0.00147054 0.00147626 0.00149032 0.00149562]
2578
2579 10 largest Differences in logl according to simplex at
termination:
2580 [0.00212667 0.00214294 0.00214886 0.00215343 0.00216068
0.0021792
2581 0.00218048 0.0021862 0.00220026 0.00220556]
2582
2583 10 largest Differences in x according to simplex before
termination:
2584 [0.07053259 0.07198995 0.0754337 0.08060536 0.08132062
0.08438921
2585 0.08540987 0.08630003 0.10008055 0.11008108]
2586
2587 10 largest Differences in x according to simplex at
termination:
2588 [0.07126649 0.073086 0.0741057 0.08314707 0.08341101
0.08356743
2589 0.08462202 0.08529923 0.09424706 0.09530264]
2590 Finished iteration 31, duration M step 0:01:27
2591 [ 3.20657569e-03 -2.78930602e-02 -8.77693056e-01 -7.
44545090e-05
2592 -1.14053587e+00 1.22114838e-03 -9.33008668e-16 -4.
54081501e+00
2593 1.01989138e+00 -3.50345277e-04 5.75977251e-03 -1.
72950808e-04
2594 -1.03065096e-03 -2.51371594e+00 -8.26002378e-04 -4.
84243550e-02
2595 -2.32950864e-03 -1.93697710e-04 7.38182616e-09 2.
23911305e+00
2596 4.40186777e-03 -7.44388261e-07 -1.03159757e-03 2.
83379039e+01
2597 -3.23734128e-03 2.41942773e+01 1.05375515e-10 6.
41290365e+00
```

2598	-1.22500326e+00	4.04390249e-01	2.05180680e-03	3.
	34964189e+00			
2599	2.32080155e-13	1.61910543e+00	-3.75076321e+00	8.
	07957914e-02			
2600	-2.90116451e+00	-2.49854083e-03	-8.81896357e-01	2.
	74274753e-02			
2601	-3.08069944e-08	2.30993600e+00	-1.81956887e-02	1.
	51877952e-05			
2602	-2.40674843e+00	1.35883032e-03	4.41769977e+00	-1.
	42757100e-06			
2603	5.61054143e-05	1.74184676e+01	-8.07722526e-06	-7.
	79035525e-13			
2604	9.86531058e+00	-6.47990419e-01	1.51881221e+01	-1.
	27373680e+00			
2605	2.72619488e-01	-1.59340852e-08	6.01101386e-01	-4.
	23202399e-04			
2606	1.35088040e-03	-1.53941552e+00	1.68046994e+00	-1.
	45511097e-03			
2607	-2.38509744e-02	1.24116028e-03	-7.44750596e-03	2.
	05678542e-05			
2608	1.71194516e+00	2.03082406e-03	2.80583140e-03	-7.
	06248947e-06			
2609	8.74251213e-04	3.60221726e+00	1.17139106e-02	-2.
	55318206e-03			
2610	-4.19396776e-10	-3.14054566e-10	-1.26751503e+01	-4.
	97897501e-11			
2611	-1.61424658e+01	-7.66453811e-04	-1.70517082e-05	-2.
	69366637e+00			
2612	1.02518335e-02	-1.76747800e-04	-3.76668431e-04	3.
	46132635e-04			
2613	-2.04029360e-02	3.11738306e+00	5.05811029e+00	1.
	05833558e+01			
2614	-9.65521662e-03	9.91989191e-04	1.43850392e+00	8.
	81987009e-06			
2615	-1.25539758e-07	6.58278358e-07	-8.03364045e-04	2.
	93292425e+00			
2616	1.91470426e-04	8.87742635e-05	-5.03237844e-03	3.
	39381861e+00			
2617	1.46397160e-02	3.56948797e-03	6.07334957e-07	1.
	32873594e-07			
2618	-3.22274354e-06	1.15263624e-05	1.41212285e-03	-2.
	11072823e-03			
2619	4.28870332e-04	-1.63003303e-03	7.54277913e-03	1.
	27358025e-03			
2620	-1.44282427e-03	2.46745039e-03	-1.47786198e-03	1.
	86350860e+00			

```

2621 -3.17065308e-02 1.14593969e-02 -7.27599558e-10 1.
      16698282e-03
2622 1.49162148e-04 -1.45413980e-07 -2.18076501e-08 -3.
      48018748e-11
2623 -7.15773494e-05 -1.12584380e-02 -1.25617657e-08 2.
      25228802e-06
2624 -1.67965436e-06 4.72233956e-06 7.10213046e-07 2.
      58076831e-07
2625 2.07052755e-02 -9.59089823e-03 -3.06892745e-05 3.
      88022102e-06
2626 1.75536958e+01 1.88939863e+01 1.56324069e-01 1.
      55006400e+01
2627 1.54640108e+01 2.03893826e+00 3.13103531e-08 1.
      52163774e-04
2628 -2.80585452e-05 7.88639720e-07 1.19699966e+00 9.
      77883004e-01
2629 -3.82071562e-04 -5.17887325e-05 -4.14889185e-04 2.
      25505745e-04
2630 -5.96536251e-02 -1.84224647e-06 -2.14550557e-04 -8.
      01742718e-03
2631 6.03247544e-02 2.47506194e-04 4.68251805e-05 2.
      77576477e-04
2632 1.56200532e-04 -7.24653337e-06 4.06861271e-05 -2.
      55458814e-11
2633 -1.36043681e+01 -1.48484626e-11 6.91808628e-07 9.
      58813382e+00
2634 8.37878382e+00 -7.27534362e+00 -5.98595007e-04 -5.
      17207178e-01
2635 7.54915817e-01 -6.42101446e+00 1.05820358e+01 1.
      26156571e+01
2636 -4.32303122e-05 1.32763655e-01 -6.58716142e-01 8.
      82497385e-01
2637 -6.59655240e-01 -1.06806121e+01 -7.28737598e+00 -1.
      88489070e+01
2638 1.34977322e+00 -3.48995091e-01 -9.82132901e+00 -9.
      58264472e+00
2639 -8.62109535e-01 -4.26049531e+00 7.29281358e+00 1.
      34865706e+00
2640 -3.56600471e-01 -1.74020672e+00 -1.97928087e+00]
2641 norm absolute difference alpha: 0.006004332947054473
2642 norm absolute difference beta: 0.2853989295800309
2643 LogLikelihood value: 11604.573735965005
2644 Difference LogLikelihood value: -0.05008578396336816
2645 E-step duration: 0:00:03
2646 function value: 11637.648483120569 at iteration 1000
2647 function value: 11637.640274875761 at iteration 2000

```

```
2648 function value: 11637.633061610168 at iteration 3000
2649 Optimization terminated successfully.
2650     Current function value: 11637.630233
2651     Iterations: 2823
2652     Function evaluations: 3310
2653
2654 10 largest Differences in logl according to simplex
before termination:
2655 [0.0015085 0.0015189 0.00152809 0.0015403 0.0015466
0.00155545
2656 0.00156213 0.00157215 0.00157735 0.00158116]
2657
2658 10 largest Differences in logl according to simplex at
termination:
2659 [0.00227276 0.00228315 0.00229234 0.00230455 0.00231086
0.00231971
2660 0.00232638 0.0023364 0.00234161 0.00234541]
2661
2662 10 largest Differences in x according to simplex before
termination:
2663 [0.07258851 0.07883506 0.08171274 0.0851148 0.08615407
0.08781917
2664 0.09149756 0.09371467 0.09425893 0.10175355]
2665
2666 10 largest Differences in x according to simplex at
termination:
2667 [0.07180764 0.0808144 0.08260777 0.08364505 0.08384453
0.08482526
2668 0.09093462 0.09318233 0.0942494 0.09975419]
2669 Finished iteration 32, duration M step 0:01:33
2670 [ 3.20802284e-03 -2.78520756e-02 -8.77308604e-01 -7.
43261472e-05
2671 -1.14870404e+00 1.21735048e-03 -9.78370575e-16 -4.
55268307e+00
2672 1.01180939e+00 -3.49205464e-04 5.75054859e-03 -1.
71403239e-04
2673 -1.02713627e-03 -2.52180195e+00 -8.54374605e-04 -4.
81938361e-02
2674 -2.33200414e-03 -1.93172165e-04 7.67251212e-09 2.
23148681e+00
2675 4.42342659e-03 -7.45857149e-07 -1.02835757e-03 2.
83355711e+01
2676 -3.24295732e-03 2.42020388e+01 1.05654906e-10 6.
41139444e+00
2677 -1.22524125e+00 4.04213811e-01 2.05531123e-03 3.
34896459e+00
```

2678	2.33323512e-13	1.61849704e+00	-3.75465914e+00	8.
	06503199e-02			
2679	-2.90471202e+00	-2.50191599e-03	-8.79682999e-01	2.
	72892446e-02			
2680	-3.08879401e-08	2.30760132e+00	-1.79507855e-02	1.
	50294215e-05			
2681	-2.40477092e+00	1.35423011e-03	4.41530750e+00	-1.
	41058263e-06			
2682	5.59321214e-05	1.74239680e+01	-8.02057957e-06	-7.
	83373697e-13			
2683	9.86129686e+00	-6.49562514e-01	1.51961497e+01	-1.
	27293970e+00			
2684	2.73600255e-01	-1.58937687e-08	5.94238133e-01	-4.
	22343085e-04			
2685	1.34639070e-03	-1.54002935e+00	1.67894432e+00	-1.
	45055765e-03			
2686	-2.37192471e-02	1.23722767e-03	-7.42945186e-03	2.
	01457296e-05			
2687	1.70982024e+00	2.03257114e-03	2.81030561e-03	-6.
	93332931e-06			
2688	8.71737039e-04	3.59867956e+00	1.17664137e-02	-2.
	56502260e-03			
2689	-4.22037847e-10	-3.13729252e-10	-1.26717741e+01	-4.
	97974352e-11			
2690	-1.61458833e+01	-7.64812965e-04	-1.62637049e-05	-2.
	70488404e+00			
2691	1.02191303e-02	-1.77613150e-04	-3.77386294e-04	3.
	45099760e-04			
2692	-2.03563461e-02	3.11688980e+00	5.05126995e+00	1.
	05768635e+01			
2693	-9.62412333e-03	9.96096903e-04	1.43372420e+00	8.
	83749248e-06			
2694	-1.25855662e-07	6.59570980e-07	-8.07496146e-04	3.
	04713547e+00			
2695	1.90930161e-04	8.88082759e-05	-5.01212178e-03	3.
	40378219e+00			
2696	1.45831708e-02	3.55110386e-03	6.08525836e-07	1.
	32547632e-07			
2697	-3.20542673e-06	1.14112367e-05	1.41964306e-03	-2.
	12266283e-03			
2698	4.29707051e-04	-1.62406543e-03	7.52508068e-03	1.
	33056392e-03			
2699	-1.43975927e-03	2.47060834e-03	-1.47913279e-03	1.
	86137284e+00			
2700	-3.13571642e-02	1.11171328e-02	-7.28699166e-10	1.
	16575184e-03			

```

2701  1.49861363e-04 -1.45727207e-07 -2.12349790e-08 -3.
      34287402e-11
2702  -7.19011726e-05 -1.13729126e-02 -1.25845988e-08  2.
      25701850e-06
2703  -1.68258815e-06  4.69447143e-06  7.08379968e-07  2.
      64469378e-07
2704  2.04543812e-02 -9.19131381e-03 -3.05986232e-05  3.
      82050015e-06
2705  1.75912641e+01  1.89703878e+01  1.50478792e-01  1.
      55368192e+01
2706  1.55095598e+01  2.03292312e+00  3.13756139e-08  1.
      51650048e-04
2707  -2.80168414e-05  7.90793878e-07  1.19714235e+00  1.
      10925744e+00
2708  -3.80849695e-04 -5.63995522e-05 -4.14228346e-04  2.
      26548784e-04
2709  -6.00726988e-02 -1.86146007e-06 -2.13858807e-04 -8.
      00287947e-03
2710  6.14346354e-02  2.41952720e-04  4.66516150e-05  2.
      78964249e-04
2711  1.55393195e-04 -7.19744971e-06  4.06107336e-05 -2.
      56023313e-11
2712  -1.36339246e+01 -1.49276240e-11  6.89312305e-07  9.
      59141537e+00
2713  8.37673859e+00 -7.27646248e+00 -5.72593407e-04 -5.
      18151084e-01
2714  7.54279365e-01 -6.42593931e+00  1.05816870e+01  1.
      26153397e+01
2715  -4.31245317e-05  1.32649382e-01 -6.58669800e-01  8.
      82800585e-01
2716  -6.59908948e-01 -1.06880972e+01 -7.28811802e+00 -1.
      88553016e+01
2717  1.35009782e+00 -3.49189964e-01 -9.81890113e+00 -9.
      58146132e+00
2718  -8.62292884e-01 -4.26026113e+00  7.29230257e+00  1.
      34888868e+00
2719  -3.56432476e-01 -1.74019507e+00 -1.97988131e+00]
2720 norm absolute difference alpha: 0.004603069297958021
2721 norm absolute difference beta: 0.08822472894629892
2722 LogLikelihood value: 11604.52400958339
2723 Difference LogLikelihood value: -0.049726381614163984
2724 E-step duration: 0:00:03
2725 function value: 11637.460990586958 at iteration 1000
2726 Optimization terminated successfully.
2727          Current function value: 11637.458086
2728          Iterations: 763

```

```
2729          Function evaluations: 1233
2730
2731 10 largest Differences in logl according to simplex
      before termination:
2732 [0.00155746 0.00156553 0.00157401 0.001582  0.00159052
     0.00159854
2733 0.00161791 0.00161812 0.00162606 0.00163407]
2734
2735 10 largest Differences in logl according to simplex at
      termination:
2736 [0.00265645 0.00266451 0.00267299 0.00268098 0.00268951
     0.00269752
2737 0.00271689 0.00271711 0.00272504 0.00273306]
2738
2739 10 largest Differences in x according to simplex before
      termination:
2740 [0.07698399 0.0785433  0.07939736 0.08417941 0.08440259
     0.08913055
2741 0.08921601 0.09412031 0.09523302 0.11323502]
2742
2743 10 largest Differences in x according to simplex at
      termination:
2744 [0.07558131 0.0769354  0.07841087 0.08237859 0.08251552
     0.08368642
2745 0.08978323 0.08984376 0.09608092 0.09692571]
2746 Finished iteration 33, duration M step 0:00:36
2747 [ 3.20802284e-03 -2.78520756e-02 -8.77308604e-01 -7.
     43261472e-05
2748 -1.14870404e+00  1.21735048e-03 -9.78370575e-16 -4.
     55268307e+00
2749 1.01180939e+00 -3.49205464e-04  5.75054859e-03 -1.
     71403239e-04
2750 -1.02713627e-03 -2.52180195e+00 -8.54374605e-04 -4.
     81938361e-02
2751 -2.33200414e-03 -1.93172165e-04  7.67251212e-09 2.
     23148681e+00
2752 4.42342659e-03 -7.45857149e-07 -1.02835757e-03 2.
     83355711e+01
2753 -3.24295732e-03  2.42020388e+01  1.05654906e-10 6.
     41139444e+00
2754 -1.22524125e+00  4.04213811e-01  2.05531123e-03 3.
     34896459e+00
2755 2.33323512e-13  1.61849704e+00 -3.75465914e+00 8.
     06503199e-02
2756 -2.90471202e+00 -2.50191599e-03 -8.79682999e-01 2.
     72892446e-02
```

2757	-3.08879401e-08	2.30760132e+00	-1.79507855e-02	1.
	50294215e-05			
2758	-2.40477092e+00	1.35423011e-03	4.41530750e+00	-1.
	41058263e-06			
2759	5.59321214e-05	1.74239680e+01	-8.02057957e-06	-7.
	83373697e-13			
2760	9.86129686e+00	-6.49562514e-01	1.51961497e+01	-1.
	27293970e+00			
2761	2.73600255e-01	-1.58937687e-08	5.94238133e-01	-4.
	22343085e-04			
2762	1.34639070e-03	-1.54002935e+00	1.67894432e+00	-1.
	45055765e-03			
2763	-2.37192471e-02	1.23722767e-03	-7.42945186e-03	2.
	01457296e-05			
2764	1.70982024e+00	2.03257114e-03	2.81030561e-03	-6.
	93332931e-06			
2765	8.71737039e-04	3.59867956e+00	1.17664137e-02	-2.
	56502260e-03			
2766	-4.22037847e-10	-3.13729252e-10	-1.26717741e+01	-4.
	97974352e-11			
2767	-1.61458833e+01	-7.64812965e-04	-1.62637049e-05	-2.
	70488404e+00			
2768	1.02191303e-02	-1.77613150e-04	-3.77386294e-04	3.
	45099760e-04			
2769	-2.03563461e-02	3.11688980e+00	5.05126995e+00	1.
	05768635e+01			
2770	-9.62412333e-03	9.96096903e-04	1.43372420e+00	8.
	83749248e-06			
2771	-1.25855662e-07	6.59570980e-07	-8.07496146e-04	3.
	04713547e+00			
2772	1.90930161e-04	8.88082759e-05	-5.01212178e-03	3.
	40378219e+00			
2773	1.45831708e-02	3.55110386e-03	6.08525836e-07	1.
	32547632e-07			
2774	-3.20542673e-06	1.14112367e-05	1.41964306e-03	-2.
	12266283e-03			
2775	4.29707051e-04	-1.62406543e-03	7.52508068e-03	1.
	33056392e-03			
2776	-1.43975927e-03	2.47060834e-03	-1.47913279e-03	1.
	86137284e+00			
2777	-3.13571642e-02	1.11171328e-02	-7.28699166e-10	1.
	16575184e-03			
2778	1.49861363e-04	-1.45727207e-07	-2.12349790e-08	-3.
	34287402e-11			
2779	-7.19011726e-05	-1.13729126e-02	-1.25845988e-08	2.
	25701850e-06			

```

2780 -1.68258815e-06 4.69447143e-06 7.08379968e-07 2.
       64469378e-07
2781 2.04543812e-02 -9.19131381e-03 -3.05986232e-05 3.
       82050015e-06
2782 1.75912641e+01 1.89703878e+01 1.50478792e-01 1.
       55368192e+01
2783 1.55095598e+01 2.03292312e+00 3.13756139e-08 1.
       51650048e-04
2784 -2.80168414e-05 7.90793878e-07 1.19714235e+00 1.
       16472031e+00
2785 -3.80849695e-04 -5.63995522e-05 -4.14228346e-04 2.
       26548784e-04
2786 -6.00726988e-02 -1.86146007e-06 -2.13858807e-04 -8.
       00287947e-03
2787 6.14346354e-02 2.41952720e-04 4.66516150e-05 2.
       78964249e-04
2788 1.55393195e-04 -7.19744971e-06 4.06107336e-05 -2.
       56023313e-11
2789 -1.36339246e+01 -1.49276240e-11 6.89312305e-07 9.
       59141537e+00
2790 8.37673859e+00 -7.27646248e+00 -5.72593407e-04 -5.
       18151084e-01
2791 7.54279365e-01 -6.42593931e+00 1.05816870e+01 1.
       26153397e+01
2792 -4.31245317e-05 1.32649382e-01 -6.58669800e-01 8.
       82800585e-01
2793 -6.59908948e-01 -1.06880972e+01 -7.28811802e+00 -1.
       88553016e+01
2794 1.35009782e+00 -3.49189964e-01 -9.81890113e+00 -9.
       58146132e+00
2795 -8.62292884e-01 -4.26026113e+00 7.29230257e+00 1.
       34888868e+00
2796 -3.56432476e-01 -1.74019507e+00 -1.97988131e+00]
2797 norm absolute difference alpha: 0.004975482971865747
2798 norm absolute difference beta: 0.0732046359868627
2799 LogLikelihood value: 11604.516681488009
2800 Difference LogLikelihood value: -0.007328095382035826
2801 E-step duration: 0:00:03
2802 function value: 11637.456019052253 at iteration 1000
2803 function value: 11637.448208722273 at iteration 2000
2804 function value: 11637.441158419426 at iteration 3000
2805 Optimization terminated successfully.
2806 Current function value: 11637.435553
2807 Iterations: 3238
2808 Function evaluations: 3723
2809

```

```
2810 10 largest Differences in logl according to simplex  
before termination:  
2811 [0.00160409 0.00161407 0.00161443 0.00161896 0.00163968  
0.00164224  
2812 0.00165318 0.00166041 0.00166231 0.00166769]  
2813  
2814 10 largest Differences in logl according to simplex at  
termination:  
2815 [0.00217715 0.00218713 0.00218749 0.00219202 0.00221274  
0.0022153  
2816 0.00222624 0.00223347 0.00223537 0.00224075]  
2817  
2818 10 largest Differences in x according to simplex before  
termination:  
2819 [0.07370649 0.0788124 0.08098212 0.08236057 0.08419722  
0.08702812  
2820 0.08711595 0.09232253 0.0975626 0.10464608]  
2821  
2822 10 largest Differences in x according to simplex at  
termination:  
2823 [0.07307639 0.07623142 0.08010318 0.08022934 0.08028898  
0.08669113  
2824 0.08776384 0.09359677 0.09474414 0.09982556]  
2825 Finished iteration 34, duration M step 0:01:45  
2826 [ 3.20611519e-03 -2.76884635e-02 -8.76044227e-01 -7.  
44871650e-05  
2827 -1.15000798e+00 1.21749572e-03 -9.77033507e-16 -4.  
56660526e+00  
2828 1.00964788e+00 -3.49756972e-04 5.67007064e-03 -1.  
71716254e-04  
2829 -1.02663257e-03 -2.51818680e+00 -8.54974366e-04 -4.  
56796506e-02  
2830 -2.34123380e-03 -1.93450493e-04 7.63259348e-09 2.  
22661932e+00  
2831 4.45186986e-03 -7.47099165e-07 -1.02798392e-03 2.  
83672396e+01  
2832 -3.25079537e-03 2.42139209e+01 1.05011086e-10 6.  
41216395e+00  
2833 -1.22504071e+00 4.04361327e-01 2.14633433e-03 3.  
35505942e+00  
2834 2.32690384e-13 1.62202650e+00 -3.75163042e+00 8.  
10939768e-02  
2835 -2.90479649e+00 -2.36327648e-03 -8.80031653e-01 2.  
68058719e-02  
2836 -3.12802305e-08 2.31079050e+00 -1.75514830e-02 1.  
50011153e-05
```

2837	-2.40241488e+00	1.34233331e-03	4.42432219e+00	-1.
	40653121e-06			
2838	5.58705308e-05	1.74295476e+01	-8.01022699e-06	-7.
	53794889e-13			
2839	9.85676270e+00	-6.48384295e-01	1.51932161e+01	-1.
	27526565e+00			
2840	2.73157695e-01	-1.58764381e-08	5.90191572e-01	-4.
	22010659e-04			
2841	1.34836862e-03	-1.53534779e+00	1.68245968e+00	-1.
	36121667e-03			
2842	-2.28626912e-02	1.23675034e-03	-7.35378497e-03	2.
	07214239e-05			
2843	1.71060253e+00	2.14034468e-03	2.80720352e-03	-6.
	92022228e-06			
2844	8.72958268e-04	3.59260663e+00	1.18493521e-02	-2.
	58379519e-03			
2845	-4.21296694e-10	-3.13085155e-10	-1.26757444e+01	-5.
	29037025e-11			
2846	-1.61558315e+01	-7.46276327e-04	-1.63612900e-05	-2.
	70168046e+00			
2847	1.00010756e-02	-1.78867608e-04	-3.74029528e-04	3.
	45604144e-04			
2848	-2.00917079e-02	3.12258086e+00	5.03253826e+00	1.
	05552927e+01			
2849	-1.04291803e-02	1.00949171e-03	1.42530438e+00	8.
	88872246e-06			
2850	-1.25876058e-07	6.60066514e-07	-8.14820410e-04	3.
	18273443e+00			
2851	1.91226031e-04	8.88743420e-05	-4.94315956e-03	3.
	43248962e+00			
2852	1.43484604e-02	3.51719379e-03	5.80148830e-07	1.
	32207760e-07			
2853	-3.20323395e-06	1.13849889e-05	1.43784126e-03	-2.
	14528784e-03			
2854	4.30029749e-04	-1.63700991e-03	7.56637509e-03	1.
	33066596e-03			
2855	-1.41575667e-03	2.47904447e-03	-1.47928141e-03	1.
	86061775e+00			
2856	-3.07154440e-02	1.10273242e-02	-7.23196312e-10	1.
	15883432e-03			
2857	1.50944039e-04	-1.45935786e-07	-2.10488789e-08	-3.
	31817168e-11			
2858	-7.23715084e-05	-1.15465824e-02	-1.32999781e-08	2.
	26911874e-06			
2859	-1.69129265e-06	4.66869647e-06	7.05473827e-07	2.
	63450857e-07			

```

2860  2.01619814e-02 -9.12880740e-03 -3.06412522e-05  3.
      81751343e-06
2861  1.76192936e+01  1.90823319e+01  1.44018239e-01  1.
      55840037e+01
2862  1.55588828e+01  2.02475178e+00  3.14216712e-08  1.
      51854699e-04
2863  -2.80992755e-05  7.89980032e-07  1.18819498e+00  1.
      33722186e+00
2864  -3.80528652e-04  -5.56715177e-05 -4.14910099e-04  2.
      28106149e-04
2865  -5.94441103e-02  -1.93669131e-06 -2.13606943e-04  -7.
      93306704e-03
2866  6.08913033e-02  2.41250036e-04  4.72211267e-05  2.
      80607017e-04
2867  1.55684513e-04  -7.18776461e-06  4.06965184e-05  -2.
      55780377e-11
2868  -1.36337920e+01  -1.48630043e-11  6.86041258e-07  9.
      58836208e+00
2869  8.37831698e+00  -7.27659082e+00 -5.72770760e-04  -5.
      19259904e-01
2870  7.53779224e-01  -6.41959796e+00  1.05817085e+01  1.
      26148529e+01
2871  -4.32008157e-05  1.32620485e-01  -6.59025266e-01  8.
      82523186e-01
2872  -6.59238986e-01  -1.06919378e+01  -7.28516569e+00  -1.
      88556039e+01
2873  1.34970279e+00  -3.49457018e-01  -9.81642922e+00  -9.
      57382549e+00
2874  -8.62030603e-01  -4.26001351e+00  7.29272273e+00  1.
      34858844e+00
2875  -3.56195929e-01  -1.74051169e+00  -1.97925616e+00]
2876 norm absolute difference alpha: 0.0003914590768301215
2877 norm absolute difference beta: 0.1391778072312566
2878 LogLikelihood value: 11604.46106849115
2879 Difference LogLikelihood value: -0.055612996859053965
2880 Total EM duration: 1:21:06
2881 Doing another BFGS step for the covariance at 08:04:03
2882 Warning: Desired error not necessarily achieved due to
precision loss.
2883          Current function value: 10877.183961
2884          Iterations: 178
2885          Function evaluations: 58611
2886          Gradient evaluations: 293
2887 Done calculating at 08:28:37!
2888 HMM finished! Total time: 1:45:40
2889 ***Checking HMM output***
```

```

2890 Interpreting the following parameters
2891 Gamma_0: [[ 1.08319491e+02  2.99746162e+01 -4.17462466e+
  01  4.65894755e-01
2892      3.80433479e+01 -6.25144903e+00  7.42481247e+01 -1.
  01288551e+02
2893      1.03654958e+02 -7.70121081e+00 -3.43005928e-01 -2.
  70357323e+01
2894      7.13604687e+00 -3.53775535e+01  5.92352559e+01 -1.
  07061955e+00
2895      -1.43905933e-02 -4.06578697e+01  6.35317680e+01  1.
  23063342e+02
2896      4.28232827e+01 -9.63479134e+01 -1.02835757e-03  2.
  26947536e+02
2897      6.68749197e-01  2.02731676e+02 -2.02082857e+02]
2898  [ 5.78746294e+01  3.31731736e+01 -5.65432222e+01 -4.
  48168597e+01
2899      1.44617051e+02 -7.19028586e+01  3.20599194e+01 -6.
  07876921e+01
2900      1.73181960e+02  1.25988245e+01 -1.03553820e+01 -9.
  42619041e+01
2901      7.05570695e+00 -3.18957254e+01  7.55358357e+01  3.
  39954215e+01
2902      -4.97258671e+00 -8.34620830e+01 -2.82604614e+01  1.
  70874180e+02
2903      9.43309996e+01 -4.46317322e+01  3.26938507e+02  8.
  59810449e-03
2904      2.56468992e+02  1.43447636e+02  3.19792394e+01]
2905  [ 2.63875868e+02  1.17867192e+01 -4.23683451e+01  9.
  60975545e+00
2906      1.20265476e+02  2.99017651e+01  7.64534926e+01  1.
  15565626e+01
2907      1.24001542e+02 -1.01842615e+01  2.32847798e+01 -1.
  38259185e+01
2908      8.08303363e+00 -2.94409310e+01  5.16500629e+01  2.
  56173727e+00
2909      5.45410896e+00 -4.29505403e+01  2.28766922e+01  1.
  29916045e+02
2910      7.87891776e+01  3.81849606e+00 -1.97411249e+02 -1.
  77850199e+02
2911      -5.89736471e+01 -1.67456260e+02 -3.22453886e+02]]
2912 Gamma_sr_0: [[ 1.98404688e+00 -5.00892904e+01 -7.
  16518958e+01 -1.92055107e-01]
2913  [-6.53177703e+01  7.00893660e+00 -1.89653160e+01  3.
  80896966e-01]
2914  [ 6.87462804e+01  5.12249265e+01  1.09010925e+02 -7.
  97078693e-02]]

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2915 Gamma_sk_t: [[ 2.91686837e+01  9.59200746e-02  1.
    07764279e+01 -1.45385242e+02
2916      2.31923710e+01 -7.18771822e+00 -1.21384387e+01 -7.
    81443434e+01
2917      -7.58846358e+01  5.67501725e+01  9.38667970e+01 -1.
    35030974e+02
2918      -6.22250906e+01 -5.67612277e+01 -4.26140276e+01 -1.
    26357877e+01
2919      7.24814984e+01  1.05017216e+01 -7.49705156e+00  6.
    45909440e+00
2920      -3.57296886e+01 -1.99734752e+01  3.53629020e+02  1.
    74990084e+02
2921      5.84581131e+01 -5.58326317e+01]
2922  [-6.76881396e+00  1.64658648e+01 -2.80105684e+01  4.
    84746744e+01
2923      -5.20431074e+01 -3.37091275e+01 -7.37073847e+00  5.
    80074566e+01
2924      6.32126454e+01 -5.28333197e+01 -1.05412804e+02  1.
    16540395e+02
2925      9.07605855e+01  5.13841734e+01  6.28647461e+01 -3.
    16617256e+01
2926      -6.87698474e+01 -6.61754674e+00 -9.25784770e+00 -6.
    93953635e+00
2927      3.32539649e+01  1.97606573e+02 -4.85451571e+01  6.
    44977009e+00
2928      1.35077380e+02  2.04973952e+02]
2929  [ 3.48462492e+00  1.01301120e+01  2.05174595e+01  9.
    91566457e+01
2930      3.00268971e+01  5.18385756e+01  2.53711592e+01  2.
    62310606e+01
2931      1.70169450e+01 -1.33472574e+00  2.23349438e+01  1.
    91146472e+01
2932      -2.39149197e+01  9.89715511e+00 -1.89813558e+01  4.
    50436365e+01
2933      -3.20195184e+00 -8.42511690e-01  1.77363199e+01  4.
    79737143e+00
2934      4.77852993e+00 -1.60582601e+02 -2.86719268e+02 -1.
    86909945e+02
2935      -1.78033980e+02 -1.33539217e+02]]
2936 Beta: [[[ 7.63120499e+01  6.14509865e+01 -5.63856679e+01]
2937  [ 3.13504105e-01  0.00000000e+00  0.00000000e+00]
2938  [-5.99998589e-01  0.00000000e+00  0.00000000e+00]
2939  [ 1.28515261e+00 -8.63032632e+01  0.00000000e+00]]]
2940
2941 [[ 8.37580381e+01  7.36139925e+01  6.05601862e+01]
2942  [ 8.90401547e-02  0.00000000e+00  0.00000000e+00]]

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2943	[-1.05191144e+00	0.00000000e+00	0.00000000e+00]
2944	[7.01735421e-01	2.66510084e-02	0.00000000e+00]]
2945			
2946	[[-1.02391524e+02	-1.00333301e+02	-8.93709487e+01]
2947	[1.44783246e+00	0.00000000e+00	0.00000000e+00]
2948	[-4.82076100e-01	0.00000000e+00	0.00000000e+00]
2949	[-7.99657038e+01	-8.77204918e+01	0.00000000e+00]]
2950			
2951	[[7.04853562e+00	1.70545870e+01	2.90645038e+01]
2952	[1.25095061e+00	0.00000000e+00	0.00000000e+00]
2953	[-2.23608413e-01	0.00000000e+00	0.00000000e+00]
2954	[-1.94549287e+00	-1.94310248e+00	0.00000000e+00]]]
2955	[1.08319491e+02	2.99746162e+01	-4.17462466e+01
	65894755e-01		
2956	3.80433479e+01	-6.25144903e+00	7.42481247e+01
	01288551e+02		-1.
2957	1.03654958e+02	-7.70121081e+00	-3.43005928e-01
	70357323e+01		-2.
2958	7.13604687e+00	-3.53775535e+01	5.92352559e+01
	07061955e+00		-1.
2959	-1.43905933e-02	-4.06578697e+01	6.35317680e+01
	23063342e+02		1.
2960	4.28232827e+01	-9.63479134e+01	-1.02835757e-03
	26947536e+02		2.
2961	6.68749197e-01	2.02731676e+02	-2.02082857e+02
	78746294e+01		5.
2962	3.31731736e+01	-5.65432222e+01	-4.48168597e+01
	44617051e+02		1.
2963	-7.19028586e+01	3.20599194e+01	-6.07876921e+01
	73181960e+02		1.
2964	1.25988245e+01	-1.03553820e+01	-9.42619041e+01
	05570695e+00		7.
2965	-3.18957254e+01	7.55358357e+01	3.39954215e+01
	97258671e+00		-4.
2966	-8.34620830e+01	-2.82604614e+01	1.70874180e+02
	43309996e+01		9.
2967	-4.46317322e+01	3.26938507e+02	8.59810449e-03
	56468992e+02		2.
2968	1.43447636e+02	3.19792394e+01	2.63875868e+02
	17867192e+01		1.
2969	-4.23683451e+01	9.60975545e+00	1.20265476e+02
	99017651e+01		2.
2970	7.64534926e+01	1.15565626e+01	1.24001542e+02
	01842615e+01		-1.
2971	2.32847798e+01	-1.38259185e+01	8.08303363e+00
	94409310e+01		-2.

2972	5.16500629e+01	2.56173727e+00	5.45410896e+00	-4.
	29505403e+01			
2973	2.28766922e+01	1.29916045e+02	7.87891776e+01	3.
	81849606e+00			
2974	-1.97411249e+02	-1.77850199e+02	-5.89736471e+01	-1.
	67456260e+02			
2975	-3.22453886e+02	1.98404688e+00	-5.00892904e+01	-7.
	16518958e+01			
2976	-1.92055107e-01	-6.53177703e+01	7.00893660e+00	-1.
	89653160e+01			
2977	3.80896966e-01	6.87462804e+01	5.12249265e+01	1.
	09010925e+02			
2978	-7.97078693e-02	2.91686837e+01	9.59200746e-02	1.
	07764279e+01			
2979	-1.45385242e+02	2.31923710e+01	-7.18771822e+00	-1.
	21384387e+01			
2980	-7.81443434e+01	-7.58846358e+01	5.67501725e+01	9.
	38667970e+01			
2981	-1.35030974e+02	-6.22250906e+01	-5.67612277e+01	-4.
	26140276e+01			
2982	-1.26357877e+01	7.24814984e+01	1.05017216e+01	-7.
	49705156e+00			
2983	6.45909440e+00	-3.57296886e+01	-1.99734752e+01	3.
	53629020e+02			
2984	1.74990084e+02	5.84581131e+01	-5.58326317e+01	-6.
	76881396e+00			
2985	1.64658648e+01	-2.80105684e+01	4.84746744e+01	-5.
	20431074e+01			
2986	-3.37091275e+01	-7.37073847e+00	5.80074566e+01	6.
	32126454e+01			
2987	-5.28333197e+01	-1.05412804e+02	1.16540395e+02	9.
	07605855e+01			
2988	5.13841734e+01	6.28647461e+01	-3.16617256e+01	-6.
	87698474e+01			
2989	-6.61754674e+00	-9.25784770e+00	-6.93953635e+00	3.
	32539649e+01			
2990	1.97606573e+02	-4.85451571e+01	6.44977009e+00	1.
	35077380e+02			
2991	2.04973952e+02	3.48462492e+00	1.01301120e+01	2.
	05174595e+01			
2992	9.91566457e+01	3.00268971e+01	5.18385756e+01	2.
	53711592e+01			
2993	2.62310606e+01	1.70169450e+01	-1.33472574e+00	2.
	23349438e+01			
2994	1.91146472e+01	-2.39149197e+01	9.89715511e+00	-1.
	89813558e+01			

```
2995 4.50436365e+01 -3.20195184e+00 -8.42511690e-01 1.  
    77363199e+01  
2996 4.79737143e+00 4.77852993e+00 -1.60582601e+02 -2.  
    86719268e+02  
2997 -1.86909945e+02 -1.78033980e+02 -1.33539217e+02 7.  
    63120499e+01  
2998 6.14509865e+01 -5.63856679e+01 3.13504105e-01 -5.  
    99998589e-01  
2999 1.28515261e+00 -8.63032632e+01 8.37580381e+01 7.  
    36139925e+01  
3000 6.05601862e+01 8.90401547e-02 -1.05191144e+00 7.  
    01735421e-01  
3001 2.66510084e-02 -1.02391524e+02 -1.00333301e+02 -8.  
    93709487e+01  
3002 1.44783246e+00 -4.82076100e-01 -7.99657038e+01 -8.  
    77204918e+01  
3003 7.04853562e+00 1.70545870e+01 2.90645038e+01 1.  
    25095061e+00  
3004 -2.23608413e-01 -1.94549287e+00 -1.94310248e+00]  
3005  
3006 Process finished with exit code 0  
3007
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