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1 "C:\Program Files\Python38\python.exe" "C:\Program Files\JetBrains\PyCharm 2020.3.2\plugins\python\helpers\pydev\pydevd.py" --multiproc --qt-support=auto --client 127.0.0.1 --port 55565 --file "C:/Users/Ivan Kalinichenka/.AA_Programming/Projects/AA_KnabCase/Predicting-Cross-Sell/main.py"
2 Connected to pydev debugger (build 203.6682.179)
3 ****Processing data, at 02:01:02****
4 ****Reading df list of time series data from file****
5 sample size: 1341
6 number of periods: 12
7 ****Transforming datasets & adding some variables at 02:01:03****
8 Taking log of saldototaal, minimum that gets added to log : -66.66
9 Taking log of logins_totaal, minimum that gets added to log : 0.0
10 Taking log of aantaltransacties_totaal, minimum that gets added to log: 0.0
11 Taking log of saldototaal, minimum that gets added to log : -200.77
12 Taking log of logins_totaal, minimum that gets added to log : 0.0
13 Taking log of aantaltransacties_totaal, minimum that gets added to log: 0.0
14 Taking log of saldototaal, minimum that gets added to log : -89.05
15 Taking log of logins_totaal, minimum that gets added to log : 0.0
16 Taking log of aantaltransacties_totaal, minimum that gets added to log: 0.0
17 Taking log of saldototaal, minimum that gets added to log : -108.97
18 Taking log of logins_totaal, minimum that gets added to log : 0.0
19 Taking log of aantaltransacties_totaal, minimum that gets added to log: 0.0
20 Taking log of saldototaal, minimum that gets added to log : -74.89
21 Taking log of logins_totaal, minimum that gets added to log : 0.0
22 Taking log of aantaltransacties_totaal, minimum that gets added to log: 0.0
23 Taking log of saldototaal, minimum that gets added to log : -89.89
24 Taking log of logins_totaal, minimum that gets added to log
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24 : 0.0
25 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
26 Taking log of saldototaal, minimum that gets added to log
     : -104.89
27 Taking log of logins_totaal, minimum that gets added to log
     : 0.0
28 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
29 Taking log of saldototaal, minimum that gets added to log
     : -119.89
30 Taking log of logins_totaal, minimum that gets added to log
     : 0.0
31 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
32 Taking log of saldototaal, minimum that gets added to log
     : -134.89
33 Taking log of logins_totaal, minimum that gets added to log
     : 0.0
34 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
35 Taking log of saldototaal, minimum that gets added to log
     : -149.89
36 Taking log of logins_totaal, minimum that gets added to log
     : 0.0
37 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
38 Taking log of saldototaal, minimum that gets added to log
     : -694.28
39 Taking log of logins_totaal, minimum that gets added to log
     : 0.0
40 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
41 Taking log of saldototaal, minimum that gets added to log
     : -179.89
42 Taking log of logins_totaal, minimum that gets added to log
     : 0.0
43 Taking log of aantaltransacties_totaal, minimum that gets
     added to log: 0.0
44 Doing a check that the ID columns are the same
45 Data creation finished! Total time: 0:00:02
46 Dummy variables made:
47 ['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']
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47 ) en vrouw(en)', 'geslacht_Vrouw']
48 Dummy variables made:
49 ['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', '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_BeslotenVennootschap', 'businessType_Eenmanszaak', 'businessType_Maatschap/Stichting', 'businessType_Vennootschap onder firma', 'businessType_meerdere']
50 ****Defining variables to use at 02:01:05****
51 Running cross sell model
52 ****Running HMM at 02:01:05****
53 dependent variable: ['business_max', 'retail_max', 'joint_max', 'accountoverlay_max']
54 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']
55 number of periods: 6
56 number of segments: 4
57 number of people: 1341
58 regularization term: 0.05
59 Starting values: [ 1.26534512e+00, -4.37204814e-01, -8.28394898e-01, 6.43007696e-05, -1.68500847e-02, -2.90962152e-02, -2.83396957e-13, -2.76610224e+00, 1.93010178e+00, 2.22592955e-02, 2.39525115e-03, -7.55290222e-05, -2.00084883e-04, -1.71559456e+00, 1.07499771e-03, -4.67967948e-01, -1.67846145e-04, -4.57929117e-04, 1.17096337e-07, 3.35908631e+00, -8.02396961e-03, 1.66081285e-06, -5.16997888e-02, 2.
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59	$67214540e+01, 6.75015801e-03, 2.29953038e+01, -3.68024606e-10, 6.37639985e+00, -1.17340996e+00, 3.21046390e-01, -1.87680482e-03, 3.22869348e+00, 7.88636516e-14, 1.38267725e+00, -2.90714812e+00, 1.72140230e-01, -2.39925250e+00, 1.83925836e-03, -3.87186663e-01, 1.18393875e-02, -1.08826077e-08, 1.61255338e+00, 1.21364264e-02, 4.99672586e-06, -4.76371734e-03, -2.83176648e-03, 4.06469468e+00, 5.24345089e-07, 1.54386176e-05, 1.69981615e+01, -1.35662002e-06, 5.83288958e-12, 1.06795348e+01, -8.10647331e-01, 1.53399502e+01, -1.22464019e+00, 1.88952869e-01, -1.48054959e-07, 8.66683192e-01, -1.53115800e-04, 2.61277611e-03, -4.33596017e-01, 2.19851412e+00, -3.14949393e-02, -2.40081393e-02, 3.46873056e-02, 3.18916765e-02, -1.76565965e-05, 6.15090994e-02, -1.72971002e-03, 2.30038755e-03, 5.89949282e-05, 2.52376548e-04, 3.15626376e+00, -2.51198162e-03, -1.55618843e-01, 4.76334660e-10, -5.10826978e-10, -1.25260212e+01, 6.98428281e-09, -1.58958652e+01, -5.17284529e-04, -1.53312777e-05, -1.02613024e+00, 4.95490752e-03, 2.34161656e-04, -1.63984803e-03, -7.33086033e-05, -6.21449780e-03, 2.90147182e+00, 4.20072125e+00, 1.05522643e+01, -5.09472625e-03, -5.06047777e-03, 1.43975358e+00, 2.11515102e-04, 1.61158162e-08, -5.97575881e-07, -1.45698388e-04, -6.09830384e-03, -6.60880571e-04, -1.52824720e-02, -4.59333679e-03, 2.36253480e+00, -8.88594747e-03, -4.06925417e-01, -6.38928262e-06, 6.17987687e-08, 1.35183338e-04, 8.00747924e-05, 1.95461987e-02, -3.45335323e-02, 5.62738130e-04, -1.30713967e-03, -2.04908476e-02, 3.76188577e-04, 2.30656667e-04, -1.79479754e-04, -3.33518897e-04, 1.45978477e+00, 7.78163360e-02, 2.85557533e-03, -4.12841813e-10, -4.74162728e-04, 6.67509043e-05, 2.63751246e-06, 3.82425926e-08, -8.79868331e-11, 2.52744669e-05, 2.51149222e-02, -5.71006467e-08, 1.67171102e-05, 2.73723628e-04, 7.78545844e-06, 8.67149602e-07, 7.64128760e-06, 3.19466203e-02, 9.10524107e-03, 8.57581823e-05, 3.15108714e-06, 1.74891771e+01, 1.86527493e+01, 1.83285290e-02, 1.55582146e+01, 1.47210756e+01, 1.88863908e+00, 2.15604172e-06, 2.39062814e-05, -6.06937050e-06, 6.29134203e-06, 6.60978232e-01, 1.63304803e-01, -1.49117059e-04, -6.22322131e-04, -8.59745160e-04, 2.14732894e-03, -1.86938796e-02, -1.09081393e-05, -5.51720170e-03, -3.11081901e-03, 3.32952898e-02, 1.84991244e-03, -7.18456558e-03, 6.51687921e-02, 2.14141132e-05, -1.57015964e-06, 2.86126997e-05, -1.01411740e-10, -1.32276675e+01, -7.90383986e-11, -2.51149513e-02, 9.65801422e+00, 8.51668519e+00, -7.28761101e+00, -2.83272574e-04, -3.92679456e-01, 7.39250572e-01, -6.$
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59 41268716e+00, 1.06746690e+01, 1.27643998e+01, -1.14012997e
-04, 1.02421810e-01, -5.27644522e-01, 8.64840150e-01, -6.
47751232e-01, -1.05785579e+01, -7.14630777e+00, -1.
88666818e+01, 1.32164824e+00, -2.18712505e-01, -9.
82132674e+00, -9.54937393e+00, -9.55219347e-01, -4.
40930852e+00, 7.29337127e+00, 1.37750898e+00, -4.86648157e
-01, -1.72260334e+00, -1.99143467e+00]
60 ****Starting EM prodecure, at 02:01:05****
61 tolerance: 0.001
62 number of parameters: 199
63 maximization method: Nelder-Mead
64 random starting points: True
65 E-step duration: 0:00:04
66 function value: 11643.468357694393 at iteration 1000
67 function value: 11643.448654162854 at iteration 2000
68 function value: 11643.419701579262 at iteration 3000
69 function value: 11643.387934782826 at iteration 4000
70 function value: 11643.350582126935 at iteration 5000
71 function value: 11643.309855864376 at iteration 6000
72 function value: 11643.266022239035 at iteration 7000
73 function value: 11643.213519376537 at iteration 8000
74 function value: 11643.161941683176 at iteration 9000
75 function value: 11643.114254951724 at iteration 10000
76 function value: 11643.077451096096 at iteration 11000
77 function value: 11643.059061441076 at iteration 12000
78 function value: 11643.048539957575 at iteration 13000
79 function value: 11643.035937214949 at iteration 14000
80 function value: 11643.022856495825 at iteration 15000
81 function value: 11643.010350089768 at iteration 16000
82 function value: 11642.996683654508 at iteration 17000
83 function value: 11642.984355491875 at iteration 18000
84 function value: 11642.971467172323 at iteration 19000
85 function value: 11642.957530446765 at iteration 20000
86 function value: 11642.946818505503 at iteration 21000
87 function value: 11642.9301608558 at iteration 22000
88 function value: 11642.913722695184 at iteration 23000
89 function value: 11642.897576546644 at iteration 24000
90 function value: 11642.877949486337 at iteration 25000
91 function value: 11642.858988606222 at iteration 26000
92 function value: 11642.838890563322 at iteration 27000
93 function value: 11642.817351838868 at iteration 28000
94 function value: 11642.792312659392 at iteration 29000
95 function value: 11642.767962018688 at iteration 30000
96 function value: 11642.745587753747 at iteration 31000
97 function value: 11642.724212000398 at iteration 32000
98 function value: 11642.703942535718 at iteration 33000
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99 function value: 11642.693002181722 at iteration 34000
100 function value: 11642.686384064711 at iteration 35000
101 Optimization terminated successfully.
102         Current function value: 11642.680598
103         Iterations: 34563
104         Function evaluations: 35566
105
106 10 largest Differences in logl according to simplex
before termination:
107 [0.0027507 0.0027585 0.00275942 0.00277013 0.00278452 0
.00278936
108 0.00279157 0.00279696 0.0028048 0.00281059]
109
110 10 largest Differences in logl according to simplex at
termination:
111 [0.00278235 0.00279015 0.00279107 0.00280178 0.00281617 0
.00282101
112 0.00282322 0.00282861 0.00283645 0.00284224]
113
114 10 largest Differences in x according to simplex before
termination:
115 [0.07539924 0.07688643 0.07798984 0.07810416 0.07919976 0
.08049591
116 0.08425 0.08664078 0.09856007 0.10833756]
117
118 10 largest Differences in x according to simplex at
termination:
119 [0.08036111 0.08270785 0.08277419 0.08413216 0.08503871 0
.08880244
120 0.08902357 0.09221397 0.09381797 0.09448563]
121 Finished iteration 0, duration M step 0:35:23
122 [ 1.71558238e-03 -9.86733432e-02 -9.28975374e-01 8.
23244953e-05
123 3.24236234e-02 -5.32535659e-02 -3.80197504e-13 -3.
72401750e+00
124 1.43901959e+00 -5.44000157e-03 1.21953187e-03 1.
50199220e-04
125 -2.39126662e-04 -1.57635711e+00 2.69435843e-04 5.
00237624e-03
126 -1.05780152e-03 -1.12009524e-03 1.55680459e-07 3.
08588144e+00
127 4.94004511e-03 2.47207672e-06 -3.40526875e-02 2.
74887928e+01
128 1.25358630e-02 2.36942648e+01 -1.90254424e-09 6.
38129966e+00
129 -1.13753437e+00 3.07256538e-01 -2.97889766e-03 3.
```

129	45311575e+00					
130	1.12980355e-13	1.56030015e+00	-3.05941199e+00	9.		
	92640484e-02					
131	-2.54789487e+00	-4.30152279e-04	-4.12846112e-01	1.		
	79270317e-02					
132	-2.17378823e-08	1.64654733e+00	-2.38048206e-03	1.		
	24390986e-06					
133	-2.58307490e-03	-1.10978665e-02	4.16819894e+00	1.		
	20393836e-06					
134	3.35927281e-05	1.68772108e+01	-8.80009790e-08	9.		
	17608748e-12					
135	1.05679909e+01	-9.85622921e-01	1.54311287e+01	-1.		
	18747780e+00					
136	2.00689158e-01	-3.23542930e-07	1.11941750e+00	1.		
	57152922e-04					
137	-2.33574550e-03	-1.13891814e+00	1.89659588e+00	-4.		
	09636205e-02					
138	-7.93241067e-03	-3.31800987e-02	5.08097427e-02	-6.		
	39577330e-06					
139	1.55027634e-01	-2.55285105e-03	4.04482848e-04	1.		
	82921311e-04					
140	9.86605514e-04	3.37543620e+00	-9.43740469e-03	-5.		
	18798818e-03					
141	-2.06861910e-09	7.84255986e-10	-1.25065178e+01	1.		
	27363929e-09					
142	-1.59731295e+01	-5.24674984e-04	2.10037033e-05	-1.		
	36863195e+00					
143	1.51789777e-02	8.40618369e-04	-4.13811279e-03	6.		
	57009001e-05					
144	1.80168126e-02	3.74213771e+00	4.81612645e+00	1.		
	06343379e+01					
145	2.67309363e-03	-8.18899907e-03	1.49540894e+00	-1.		
	09403610e-03					
146	-5.03452174e-08	7.08855494e-08	1.21020428e-04	7.		
	99729457e-03					
147	-1.46328695e-03	-6.43880400e-02	-9.70211054e-03	2.		
	46668389e+00					
148	3.81272043e-04	-1.65782115e+00	-1.76342721e-05	1.		
	09521281e-07					
149	1.19653257e-04	2.15783915e-04	7.17737728e-02	7.		
	11961719e-02					
150	1.90420729e-03	-3.13257470e-03	-7.72821994e-02	7.		
	36195614e-04					
151	-1.08683977e-04	-9.22352495e-04	4.19319510e-04	1.		
	75469852e+00					
152	-2.04920212e-01	8.22666590e-03	-4.84816398e-10	4.		

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152 14748432e-04
153 5.01986773e-05 8.77291622e-06 1.20254025e-07 1.
18661513e-10
154 5.56058176e-05 6.73368791e-02 -2.11628448e-07 5.
04940634e-05
155 2.22369959e-06 1.54396233e-06 -1.36841170e-07 1.
37021777e-05
156 2.75039666e-02 -6.74854369e-03 -1.40917114e-05 -4.
95840725e-06
157 1.73665615e+01 1.84244621e+01 -4.80537819e-02 1.
55479609e+01
158 1.49688988e+01 1.80506183e+00 -7.51539778e-06 5.
69261062e-05
159 -1.71721650e-05 7.00693931e-07 8.76511487e-01 4.
64008183e-02
160 1.79814020e-04 -3.31843302e-04 -1.14071439e-03 8.
75338329e-03
161 -6.66590896e-02 -9.14260730e-06 -1.96480837e-02 -9.
51182000e-04
162 1.45535816e-03 1.83949310e-04 -1.50776957e-02 -4.
78159472e-03
163 4.03751971e-06 -3.11747563e-06 3.46723117e-05 5.
62872829e-11
164 -1.32496483e+01 -1.04054274e-10 -7.60774043e-02 9.
74821399e+00
165 8.59073812e+00 -7.15276025e+00 -4.74873264e-04 -4.
04404396e-01
166 7.41480072e-01 -6.32233486e+00 1.06837932e+01 1.
27601463e+01
167 -2.26804720e-04 1.16070601e-01 -5.39961356e-01 8.
65135987e-01
168 -6.24998353e-01 -1.06425408e+01 -7.23114191e+00 -1.
88165038e+01
169 1.33506895e+00 -2.31932596e-01 -9.89888277e+00 -9.
72744513e+00
170 -9.63723496e-01 -4.40488677e+00 7.29532390e+00 1.
36388906e+00
171 -4.74155637e-01 -1.72354593e+00 -2.01448416e+00]
172 E-step duration: 0:00:04
173 function value: 11642.021213336766 at iteration 1000
174 function value: 11642.006613263198 at iteration 2000
175 function value: 11641.99737628843 at iteration 3000
176 function value: 11641.987453187423 at iteration 4000
177 function value: 11641.981925887496 at iteration 5000
178 function value: 11641.975338673252 at iteration 6000
179 function value: 11641.967572436768 at iteration 7000

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180 function value: 11641.961207671722 at iteration 8000
181 function value: 11641.954755403998 at iteration 9000
182 function value: 11641.94529138014 at iteration 10000
183 function value: 11641.937887058608 at iteration 11000
184 function value: 11641.928765335764 at iteration 12000
185 function value: 11641.919308539073 at iteration 13000
186 function value: 11641.907372646478 at iteration 14000
187 function value: 11641.897026762032 at iteration 15000
188 function value: 11641.885131138397 at iteration 16000
189 function value: 11641.872128795885 at iteration 17000
190 function value: 11641.860314576274 at iteration 18000
191 function value: 11641.849601600308 at iteration 19000
192 function value: 11641.838015815054 at iteration 20000
193 function value: 11641.825931581452 at iteration 21000
194 function value: 11641.813916660509 at iteration 22000
195 function value: 11641.802098964481 at iteration 23000
196 function value: 11641.78968230323 at iteration 24000
197 function value: 11641.783042050296 at iteration 25000
198 function value: 11641.779154457869 at iteration 26000
199 function value: 11641.774339598662 at iteration 27000
200 Optimization terminated successfully.
201     Current function value: 11641.771839
202     Iterations: 26494
203     Function evaluations: 27450
204
205 10 largest Differences in logl according to simplex
before termination:
206 [0.00199808 0.00200245 0.00200518 0.00200908 0.00201061 0
.00201527
207 0.00202518 0.00203075 0.00205737 0.00206882]
208
209 10 largest Differences in logl according to simplex at
termination:
210 [0.00206271 0.00206707 0.00206981 0.00207371 0.00207524 0
.0020799
211 0.0020898 0.00209538 0.002122 0.00213345]
212
213 10 largest Differences in x according to simplex before
termination:
214 [0.07259493 0.0730162 0.07439525 0.07462465 0.07700018 0
.07769585
215 0.07864641 0.0796102 0.07988129 0.10444078]
216
217 10 largest Differences in x according to simplex at
termination:
218 [0.07911657 0.08051221 0.08064023 0.08220973 0.08257697 0
```

```

218 .08328419
219 0.08384943 0.08473164 0.09103884 0.09632165]
220 Finished iteration 1, duration M step 0:27:43
221 [ 1.73256680e-03 -1.19255304e-01 -8.74452793e-01 1.
      05793838e-04
222   3.05570376e-02 -3.53548097e-02 -4.17878098e-13 -3.
      77359514e+00
223   1.49409204e+00 -1.51339448e-03  5.26962734e-03  3.
      50683457e-04
224   4.41619928e-05 -1.85376366e+00  2.07088788e-05  4.
      07156733e-03
225   -1.12973933e-03  3.21753587e-03  1.00267637e-07  3.
      07928715e+00
226   1.75117677e-03  5.20790850e-06  -8.03811917e-02  2.
      74419889e+01
227   -6.47022000e-03  2.34374689e+01  -2.00172545e-09  6.
      83357702e+00
228   -1.14681590e+00  2.75473356e-01  -4.63812505e-03  3.
      27662795e+00
229   1.01998879e-13  1.35608196e+00  -3.03878660e+00  1.
      14727534e-01
230   -2.47281018e+00  -6.26313022e-04  -4.00307416e-01  7.
      82791700e-02
231   -2.05488226e-08  1.71263677e+00  -1.25175545e-04  2.
      02646864e-06
232   -2.95593890e-03  -7.10422896e-03  4.31218101e+00  1.
      65971132e-06
233   1.33417986e-05  1.65620901e+01  -5.46229986e-08  7.
      33177781e-12
234   1.02266175e+01  -1.11897065e+00  1.56294614e+01  -1.
      26548125e+00
235   2.17120571e-01  -2.41714635e-07  9.29148116e-01  -1.
      71819816e-04
236   -8.82326535e-03  -1.03700748e+00  1.90696845e+00  -6.
      34730312e-02
237   -2.36408551e-02  -4.98250028e-02  7.86185408e-02  -9.
      19586658e-06
238   4.78800866e-01  -5.01671062e-04  3.18390490e-04  2.
      56033420e-04
239   -8.61984551e-04  3.63615782e+00  -2.20392577e-02  -4.
      22203584e-03
240   4.89181328e-10  8.10139453e-10  -1.24673822e+01  1.
      00483529e-09
241   -1.60126188e+01  -4.61658080e-04  2.77642219e-05  -1.
      67961740e+00
242   1.08187457e-02  9.36861732e-04  -7.17583001e-03  1.

```

242	04211107e-04				
243	2.32166650e-02	3.40786834e+00	4.75172015e+00	1.	
	04456554e+01				
244	4.16293746e-03	-9.30492543e-03	1.56448714e+00	1.	
	17705752e-03				
245	-5.32951815e-08	7.04847170e-08	2.15431568e-04	2.	
	82538911e-03				
246	-9.80826707e-04	-1.47175175e-01	-1.67613655e-02	2.	
	25596324e+00				
247	2.57544539e-04	-2.47710036e+00	-1.03961187e-05	2.	
	19110244e-08				
248	8.89072881e-05	1.61498496e-04	1.74557411e-01	8.	
	98200192e-02				
249	7.23841138e-04	-7.01788312e-04	-1.03774836e-01	3.	
	18008353e-04				
250	-7.94459214e-05	-1.65103896e-03	3.83509093e-04	2.	
	08080295e+00				
251	-5.10849581e-01	-6.32758149e-03	-5.65490942e-10	2.	
	97439686e-04				
252	1.98694661e-04	1.49211618e-05	6.63814288e-08	1.	
	09399495e-10				
253	1.05965309e-04	-2.60239131e-01	-2.88759652e-07	2.	
	80520742e-05				
254	4.24557234e-06	-6.18681719e-07	-2.25120474e-08	3.	
	21237544e-05				
255	2.19648339e-02	-6.62033195e-03	-1.80321274e-05	-3.	
	68788104e-06				
256	1.75322854e+01	1.87658544e+01	-4.99012441e-02	1.	
	61606735e+01				
257	1.53854109e+01	1.87873044e+00	-5.40463453e-06	1.	
	15517311e-04				
258	-7.24824159e-06	2.77860134e-07	8.61456177e-01	2.	
	90231057e-02				
259	1.70326754e-04	-7.84457879e-04	-1.26850087e-03	2.	
	05377426e-02				
260	-1.08909299e-01	-3.63422320e-06	-1.57035266e-02	-5.	
	87278767e-04				
261	-1.70399823e-03	9.18052764e-05	1.67068029e-02	-6.	
	55838689e-03				
262	7.08103352e-07	-4.62890113e-06	5.05638010e-05	7.	
	75833271e-12				
263	-1.35041098e+01	-1.02300413e-10	-4.57783083e-02	9.	
	73121835e+00				
264	8.55657552e+00	-7.20702385e+00	-5.10977479e-04	-4.	
	25768232e-01				
265	7.39309654e-01	-6.28943395e+00	1.06743457e+01	1.	

```
265 27421226e+01
266 -2.37674801e-04 1.11278560e-01 -5.51885030e-01 8.
    70501986e-01
267 -6.12739744e-01 -1.06574728e+01 -7.22528587e+00 -1.
    87506403e+01
268 1.33064023e+00 -2.43696642e-01 -9.86615994e+00 -9.
    50876902e+00
269 -9.63063113e-01 -4.39463222e+00 7.28483464e+00 1.
    36850526e+00
270 -4.61703495e-01 -1.72780170e+00 -2.02675800e+00]
271 norm absolute difference alpha: 0.032399890388168054
272 norm absolute difference beta: 2.2981422912516987
273 LogLikelihood value: 11605.063429519625
274 Difference LogLikelihood value: -0.612740643122379
275 breakpoint
276 E-step duration: 0:00:05
277 function value: 11640.897518317019 at iteration 1000
278 function value: 11640.891213354244 at iteration 2000
279 function value: 11640.88201972195 at iteration 3000
280 function value: 11640.874096699545 at iteration 4000
281 function value: 11640.864481945571 at iteration 5000
282 function value: 11640.85628442112 at iteration 6000
283 function value: 11640.847347215818 at iteration 7000
284 function value: 11640.84098426235 at iteration 8000
285 function value: 11640.831803094197 at iteration 9000
286 function value: 11640.823542198885 at iteration 10000
287 function value: 11640.812625854085 at iteration 11000
288 function value: 11640.799059997315 at iteration 12000
289 function value: 11640.78524331707 at iteration 13000
290 function value: 11640.771233900632 at iteration 14000
291 function value: 11640.755097815616 at iteration 15000
292 function value: 11640.739192217265 at iteration 16000
293 function value: 11640.725074924509 at iteration 17000
294 function value: 11640.70991708188 at iteration 18000
295 function value: 11640.694861106398 at iteration 19000
296 function value: 11640.680601347667 at iteration 20000
297 function value: 11640.662283839642 at iteration 21000
298 function value: 11640.646681574317 at iteration 22000
299 function value: 11640.633450650872 at iteration 23000
300 function value: 11640.620556809932 at iteration 24000
301 function value: 11640.604947889184 at iteration 25000
302 function value: 11640.589987718347 at iteration 26000
303 function value: 11640.572050606981 at iteration 27000
304 function value: 11640.552731828819 at iteration 28000
305 function value: 11640.531994725348 at iteration 29000
306 function value: 11640.51904001781 at iteration 30000
```

```
307 function value: 11640.509631155466 at iteration 31000
308 function value: 11640.498698571093 at iteration 32000
309 function value: 11640.495060771995 at iteration 33000
310 function value: 11640.48648307161 at iteration 34000
311 function value: 11640.474673501492 at iteration 35000
312 function value: 11640.46781449585 at iteration 36000
313 function value: 11640.461864718172 at iteration 37000
314 function value: 11640.448960798603 at iteration 38000
315 function value: 11640.43944941266 at iteration 39000
316 Warning: Maximum number of function evaluations has been
exceeded.

317
318 10 largest Differences in logl according to simplex
before termination:
319 [0.00281648 0.00281736 0.00283839 0.00284462 0.00284466 0
.00284482
320 0.00284961 0.00285166 0.00285196 0.00286844]
321
322 10 largest Differences in logl according to simplex at
termination:
323 [0.00289373 0.00289461 0.00291564 0.00292187 0.00292192 0
.00292207
324 0.00292686 0.00292891 0.00292922 0.00294569]
325
326 10 largest Differences in x according to simplex before
termination:
327 [0.12465615 0.12704591 0.12801603 0.12937375 0.13304495 0
.13322973
328 0.13326622 0.14788139 0.15186887 0.15206726]
329
330 10 largest Differences in x according to simplex at
termination:
331 [0.11388018 0.11492685 0.11629117 0.11865565 0.12051645 0
.12140903
332 0.12166797 0.12534869 0.12849536 0.13268123]
333 Finished iteration 2, duration M step 0:39:39
334 [ 3.37911699e-03 -1.09603003e-01 -8.73523216e-01 1.
08617935e-04
335 1.25323353e-02 1.68500706e-02 -5.99738047e-13 -4.
06537426e+00
336 1.41061211e+00 -3.11620819e-03 4.23503733e-03 -8.
60732183e-05
337 -4.99173362e-06 -2.05305678e+00 1.85312481e-05 1.
12073559e-03
338 -8.12796486e-05 9.60140952e-03 5.00200048e-08 2.
81339049e+00
```

339	1.61015209e-03	-9.11099822e-06	-3.75305136e-02	2.
	77990264e+01			
340	2.12996426e-03	2.34788868e+01	-1.43900384e-09	6.
	83899072e+00			
341	-1.24444014e+00	3.34912736e-01	2.88306585e-03	3.
	48038038e+00			
342	3.24393390e-14	1.50365162e+00	-3.21623749e+00	1.
	38177686e-01			
343	-2.65992468e+00	-3.51285024e-04	-4.78458423e-01	1.
	75712417e-02			
344	-4.26245639e-08	1.91997654e+00	2.53063665e-05	2.
	42313438e-06			
345	-3.08220464e-03	3.43347531e-05	4.28811777e+00	1.
	45613069e-06			
346	3.38323717e-05	1.65581569e+01	-7.03059866e-08	7.
	12573333e-12			
347	1.00375700e+01	-9.56229833e-01	1.53018143e+01	-1.
	34348454e+00			
348	2.74504602e-01	-4.52074653e-07	1.18114503e+00	1.
	03332016e-04			
349	-1.98901423e-02	-1.11321703e+00	1.78227994e+00	-1.
	99955058e-01			
350	-5.81311726e-03	7.10463336e-02	-6.18277320e-03	-8.
	10986330e-06			
351	1.53961028e+00	-5.36403434e-05	-2.47191706e-05	1.
	38115667e-05			
352	-2.15368683e-03	3.53262291e+00	-6.02762560e-04	-5.
	16113058e-03			
353	-1.08879875e-09	5.49482857e-11	-1.23699787e+01	4.
	17223163e-10			
354	-1.56181194e+01	9.00230374e-04	3.39349851e-05	-1.
	60560006e+00			
355	1.16903159e-02	4.11284361e-03	-7.33837969e-03	1.
	77922836e-04			
356	4.03195433e-02	2.39576576e+00	3.88496831e+00	9.
	68838755e+00			
357	-3.44022356e-03	-3.19999035e-02	1.53670166e+00	3.
	24699761e-03			
358	-7.53385506e-08	7.30583906e-08	3.94143005e-04	1.
	41628687e-03			
359	5.71776991e-04	-2.30035144e+00	-2.18802725e-02	1.
	25080198e+00			
360	3.20979473e-04	-1.43550993e+00	-1.01569596e-05	4.
	80892749e-08			
361	4.72506483e-05	1.38168404e-04	2.64886309e-01	-2.
	70579232e-02			

362	4.26956840e-04	-1.25899264e-04	1.21761282e-02	2.
	98020006e-04			
363	-7.90179161e-05	-2.43022960e-03	3.97478472e-04	1.
	66141283e+00			
364	-1.78110633e-01	-9.40644186e-03	5.25444158e-12	3.
	10509079e-04			
365	1.57928920e-04	3.35850654e-05	1.00245168e-08	1.
	00600378e-10			
366	2.37648414e-05	-1.09741141e+00	-9.73859554e-08	7.
	47999267e-05			
367	-2.38483404e-06	-5.52264169e-07	2.04869253e-09	-4.
	26255331e-06			
368	6.24526791e-02	-9.46317736e-03	6.35773765e-05	-8.
	66205496e-06			
369	1.72081852e+01	1.85531967e+01	-1.07011487e-01	1.
	53884954e+01			
370	1.47154499e+01	1.84990495e+00	1.60555376e-06	2.
	28580253e-04			
371	-1.46404874e-05	9.78035569e-08	7.62731812e-01	2.
	80533620e-02			
372	1.50771561e-04	-2.16351239e-04	-1.57762802e-03	-1.
	17061966e-02			
373	3.94127291e-03	-3.52219958e-06	-7.26183842e-03	-1.
	84752121e-04			
374	-4.64601585e-03	9.15289734e-05	4.42436828e-02	-1.
	07463141e-02			
375	3.72477308e-07	-4.33613625e-06	1.17303183e-04	-5.
	85244618e-13			
376	-1.34789886e+01	6.48719953e-11	-1.96684339e-01	9.
	57360436e+00			
377	8.43177098e+00	-7.41172667e+00	-9.14392234e-04	-4.
	27766792e-01			
378	7.02356857e-01	-6.31187795e+00	1.06639826e+01	1.
	27798746e+01			
379	-3.46436173e-04	1.18450624e-01	-5.52393785e-01	8.
	44205475e-01			
380	-5.51080050e-01	-1.06277803e+01	-7.13955091e+00	-1.
	90357959e+01			
381	1.33732303e+00	-2.44539337e-01	-1.00577773e+01	-9.
	43450046e+00			
382	-9.25713798e-01	-4.40629128e+00	7.31192635e+00	1.
	36225670e+00			
383	-4.60826709e-01	-1.70031368e+00	-2.08826846e+00]	
384	norm absolute difference alpha:	0.034590300716911535		
385	norm absolute difference beta:	1.205910879284609		
386	LogLikelihood value:	11604.482053130236		

```
387 Difference LogLikelihood value: -0.5813763893893338
388 E-step duration: 0:00:05
389 function value: 11639.336412034472 at iteration 1000
390 function value: 11639.330051904732 at iteration 2000
391 function value: 11639.315978045577 at iteration 3000
392 function value: 11639.303845722383 at iteration 4000
393 function value: 11639.29471530865 at iteration 5000
394 function value: 11639.288054915245 at iteration 6000
395 function value: 11639.285367394808 at iteration 7000
396 Optimization terminated successfully.
397     Current function value: 11639.283145
398     Iterations: 7191
399     Function evaluations: 7830
400
401 10 largest Differences in logl according to simplex
before termination:
402 [0.00087679 0.00087738 0.00088109 0.0008838 0.00088907 0
.00089234
403 0.00090109 0.00090183 0.00090399 0.00090604]
404
405 10 largest Differences in logl according to simplex at
termination:
406 [0.00110559 0.00110618 0.0011099 0.0011126 0.00111787 0
.00112114
407 0.00112989 0.00113064 0.00113279 0.00113485]
408
409 10 largest Differences in x according to simplex before
termination:
410 [0.07072752 0.07079205 0.07093442 0.07273998 0.08200438 0
.09020348
411 0.09116213 0.09623695 0.10288811 0.1078951 ]
412
413 10 largest Differences in x according to simplex at
termination:
414 [0.07556875 0.07604678 0.07640188 0.07719126 0.07748508 0
.077622
415 0.07805856 0.07820373 0.08105377 0.08226742]
416 Finished iteration 3, duration M step 0:08:01
417 [ 3.35395683e-03 -1.08400819e-01 -8.67954499e-01 1.
08966850e-04
418 1.27882158e-02 1.66729283e-02 -5.90083592e-13 -4.
05270538e+00
419 1.40569621e+00 -3.10178337e-03 4.21808689e-03 -8.
64335363e-05
420 -4.98422714e-06 -2.13994475e+00 1.90108312e-05 1.
10499125e-03
```

421	-8.08896600e-05	9.49877151e-03	4.83788570e-08	2.
	80563069e+00			
422	1.59769671e-03	-8.99388491e-06	-3.74724965e-02	2.
	76795218e+01			
423	2.11757672e-03	2.35182236e+01	-1.60158121e-09	6.
	83772848e+00			
424	-1.24493317e+00	3.36356426e-01	2.81871062e-03	3.
	48432908e+00			
425	2.92915441e-14	1.50077209e+00	-3.21160181e+00	1.
	36880076e-01			
426	-2.63143374e+00	-3.49081349e-04	-4.74538728e-01	1.
	73658984e-02			
427	-4.26424878e-08	1.87341495e+00	2.51547836e-05	2.
	43445436e-06			
428	-3.10831243e-03	3.39119089e-05	4.30503229e+00	1.
	52531659e-06			
429	3.35612924e-05	1.64551053e+01	-7.01329529e-08	7.
	54707293e-12			
430	1.00299182e+01	-9.56991014e-01	1.53543215e+01	-1.
	34690686e+00			
431	2.68705223e-01	-4.52051249e-07	1.16381705e+00	1.
	02394019e-04			
432	-2.05692474e-02	-1.13350357e+00	1.78561189e+00	-1.
	99147096e-01			
433	-5.80378558e-03	7.11303851e-02	-6.10076974e-03	-8.
	08134636e-06			
434	1.50236063e+00	-5.42189504e-05	-2.42999989e-05	1.
	37411296e-05			
435	-1.98179301e-03	3.52546344e+00	-5.85406968e-04	-5.
	54526795e-03			
436	-9.81900533e-10	5.47322131e-11	-1.24364515e+01	4.
	12132601e-10			
437	-1.56151639e+01	8.98818884e-04	3.30904823e-05	-1.
	60443604e+00			
438	1.17477088e-02	4.04735128e-03	-7.17918425e-03	1.
	78934570e-04			
439	4.04769429e-02	2.43871668e+00	3.95566869e+00	9.
	69629019e+00			
440	-3.47072971e-03	-3.14417885e-02	1.55310549e+00	3.
	18524333e-03			
441	-7.13260260e-08	7.31731228e-08	3.81837445e-04	1.
	41299273e-03			
442	5.82325292e-04	-3.45317513e+00	-2.18203141e-02	1.
	27835703e+00			
443	3.19716739e-04	-1.37433376e+00	-1.00634384e-05	4.
	81497875e-08			

444	4.64753465e-05	1.37666950e-04	2.71747584e-01	-2.
	71924272e-02			
445	4.15641983e-04	-1.25074476e-04	1.20869527e-02	2.
	97426349e-04			
446	-7.81462270e-05	-2.41590533e-03	3.94222823e-04	1.
	61720155e+00			
447	-1.66580064e-01	-9.31498199e-03	5.24079087e-12	3.
	07080522e-04			
448	1.66421460e-04	3.38963916e-05	9.99304693e-09	9.
	73490161e-11			
449	2.38623735e-05	-1.08451920e+00	-9.77538233e-08	7.
	53191278e-05			
450	-2.34995657e-06	-5.53278373e-07	2.01039263e-09	-4.
	27707628e-06			
451	6.19410181e-02	-9.43290155e-03	6.36308396e-05	-8.
	66673970e-06			
452	1.72950679e+01	1.86942986e+01	-1.08974984e-01	1.
	55276615e+01			
453	1.49486500e+01	1.84165387e+00	1.70348538e-06	2.
	29113307e-04			
454	-1.48391027e-05	9.75911299e-08	7.62867522e-01	2.
	82728777e-02			
455	1.49233176e-04	-2.14979176e-04	-1.56574537e-03	-1.
	16253442e-02			
456	4.16352176e-03	-3.41607339e-06	-7.26699154e-03	-1.
	85837810e-04			
457	-4.56252645e-03	9.18415175e-05	4.41053216e-02	-1.
	06763419e-02			
458	3.79412547e-07	-4.33987611e-06	1.17068659e-04	-6.
	12814484e-13			
459	-1.34249216e+01	6.40397301e-11	-1.96290781e-01	9.
	57876979e+00			
460	8.43205448e+00	-7.38458874e+00	-8.98769550e-04	-4.
	29945404e-01			
461	7.03906727e-01	-6.34155139e+00	1.06627911e+01	1.
	27797991e+01			
462	-3.44894482e-04	1.17120333e-01	-5.52756846e-01	8.
	45161544e-01			
463	-5.50744501e-01	-1.06487640e+01	-7.13900795e+00	-1.
	88703358e+01			
464	1.33714887e+00	-2.45161553e-01	-9.85405457e+00	-9.
	47739046e+00			
465	-9.26351423e-01	-4.40618073e+00	7.31151075e+00	1.
	36226125e+00			
466	-4.60435567e-01	-1.70114665e+00	-2.08667259e+00]	
467	norm absolute difference alpha:	0.026956687049118834		

```
468 norm absolute difference beta: 3.3876635221005333
469 LogLikelihood value: 11604.146426429194
470 Difference LogLikelihood value: -0.3356267010422016
471 E-step duration: 0:00:05
472 function value: 11638.203323928632 at iteration 1000
473 function value: 11638.199685290714 at iteration 2000
474 function value: 11638.19483606264 at iteration 3000
475 function value: 11638.18940931232 at iteration 4000
476 function value: 11638.187882709002 at iteration 5000
477 Optimization terminated successfully.
478     Current function value: 11638.186211
479     Iterations: 4845
480     Function evaluations: 5505
481
482 10 largest Differences in logl according to simplex
before termination:
483 [0.00072346 0.00072652 0.00073195 0.00073485 0.00073632 0
.00074609
484 0.00074861 0.00074917 0.00074924 0.00075008]
485
486 10 largest Differences in logl according to simplex at
termination:
487 [0.00105078 0.00105384 0.00105927 0.00106217 0.00106364 0
.0010734
488 0.00107593 0.00107649 0.00107656 0.0010774 ]
489
490 10 largest Differences in x according to simplex before
termination:
491 [0.06782518 0.06844843 0.07345092 0.0735738 0.07919341 0
.08145774
492 0.08446763 0.08866953 0.1004426 0.10664019]
493
494 10 largest Differences in x according to simplex at
termination:
495 [0.06747344 0.07056441 0.07096078 0.07426379 0.07578859 0
.08414165
496 0.0857299 0.09002604 0.09168589 0.09383339]
497 Finished iteration 4, duration M step 0:05:43
498 [ 3.37391325e-03 -1.07938699e-01 -8.64558983e-01 1.
09153614e-04
499 1.27657660e-02 1.67404646e-02 -6.18451107e-13 -4.
06322390e+00
500 1.39740409e+00 -3.09674722e-03 4.21428478e-03 -8.
70348468e-05
501 -5.24758051e-06 -2.19312548e+00 1.89819046e-05 1.
11000345e-03
```

502	-8.10120939e-05	9.52057699e-03	4.82136381e-08	2.
	79183460e+00			
503	1.61120308e-03	-8.95800150e-06	-3.74717215e-02	2.
	77329882e+01			
504	2.12356903e-03	2.35503202e+01	-1.60757010e-09	6.
	83553430e+00			
505	-1.24559374e+00	3.36794598e-01	2.83823364e-03	3.
	47398887e+00			
506	2.78715633e-14	1.50147818e+00	-3.20761310e+00	1.
	36794007e-01			
507	-2.62759327e+00	-3.51504317e-04	-4.71998354e-01	1.
	73387864e-02			
508	-4.24941001e-08	1.87189911e+00	2.51890810e-05	2.
	42605162e-06			
509	-3.12097912e-03	3.39516742e-05	4.29546327e+00	1.
	54787860e-06			
510	3.36457348e-05	1.64998340e+01	-6.97562099e-08	7.
	48401528e-12			
511	1.00224304e+01	-9.58939197e-01	1.53914310e+01	-1.
	34668519e+00			
512	2.66655200e-01	-4.50241943e-07	1.14941685e+00	1.
	02735653e-04			
513	-2.04627049e-02	-1.14377744e+00	1.78403743e+00	-1.
	98342880e-01			
514	-5.80434275e-03	7.11326059e-02	-6.14723036e-03	-7.
	98977062e-06			
515	1.49008629e+00	-5.42858858e-05	-2.43815635e-05	1.
	38080797e-05			
516	-1.99187394e-03	3.52422703e+00	-5.90394830e-04	-5.
	53564906e-03			
517	-9.81563413e-10	5.32031674e-11	-1.24597389e+01	4.
	12097607e-10			
518	-1.56175899e+01	9.01769561e-04	3.33749245e-05	-1.
	61217828e+00			
519	1.17467125e-02	4.05741153e-03	-7.19448313e-03	1.
	77915063e-04			
520	4.03585274e-02	2.45978815e+00	3.97622987e+00	9.
	69409366e+00			
521	-3.50141716e-03	-3.12291971e-02	1.56094129e+00	3.
	19480954e-03			
522	-7.42061648e-08	7.33829584e-08	3.88801716e-04	1.
	42091965e-03			
523	5.85544601e-04	-3.51690252e+00	-2.17803594e-02	1.
	28603864e+00			
524	3.19517873e-04	-1.07035525e+00	-1.01124317e-05	4.
	81251364e-08			

525	4.67128521e-05	1.37924746e-04	2.74920364e-01	-2.
	72233272e-02			
526	4.16607481e-04	-1.26050517e-04	1.20618079e-02	2.
	97992804e-04			
527	-7.86629483e-05	-2.42370893e-03	3.96057934e-04	1.
	57523300e+00			
528	-1.61325419e-01	-9.34520688e-03	5.18911713e-12	3.
	08336417e-04			
529	1.67462905e-04	3.39723083e-05	9.94274016e-09	9.
	71550103e-11			
530	2.40041433e-05	-1.07928391e+00	-9.77296011e-08	7.
	53386362e-05			
531	-2.26955162e-06	-5.51554724e-07	2.09519423e-09	-4.
	25895895e-06			
532	6.17609763e-02	-9.46469444e-03	6.53400429e-05	-8.
	69395448e-06			
533	1.74855503e+01	1.88147839e+01	-1.11977827e-01	1.
	56652673e+01			
534	1.51272724e+01	1.83501814e+00	1.73635901e-06	2.
	30465809e-04			
535	-1.48610146e-05	9.75323019e-08	7.63601747e-01	2.
	84755826e-02			
536	1.35444434e-04	-2.15286953e-04	-1.58073620e-03	-1.
	16117040e-02			
537	4.19768542e-03	-3.40510678e-06	-7.23610329e-03	-1.
	85965914e-04			
538	-4.59876554e-03	9.24518361e-05	4.40855908e-02	-1.
	06732238e-02			
539	3.77528507e-07	-4.32393022e-06	1.17306820e-04	-5.
	84849211e-13			
540	-1.34190395e+01	6.38527815e-11	-1.96961730e-01	9.
	58384351e+00			
541	8.42907078e+00	-7.40045039e+00	-9.02118578e-04	-4.
	34411042e-01			
542	7.01538946e-01	-6.34951294e+00	1.06624417e+01	1.
	27796467e+01			
543	-3.46104806e-04	1.17420276e-01	-5.52644374e-01	8.
	46110465e-01			
544	-5.50978001e-01	-1.06498460e+01	-7.16825660e+00	-1.
	89040595e+01			
545	1.33558732e+00	-2.45305019e-01	-9.87031101e+00	-9.
	48770054e+00			
546	-9.26061155e-01	-4.40622406e+00	7.31150179e+00	1.
	36249322e+00			
547	-4.59920213e-01	-1.70194116e+00	-2.08612635e+00]	
548	norm absolute difference alpha:	0.01410532092117912		

```
549 norm absolute difference beta: 0.6982305917615153
550 LogLikelihood value: 11603.90425648114
551 Difference LogLikelihood value: -0.2421699480528332
552 E-step duration: 0:00:05
553 function value: 11637.087629728941 at iteration 1000
554 function value: 11637.085063952776 at iteration 2000
555 function value: 11637.08195072119 at iteration 3000
556 function value: 11637.078599523174 at iteration 4000
557 function value: 11637.075113209934 at iteration 5000
558 function value: 11637.07220492241 at iteration 6000
559 function value: 11637.06887839642 at iteration 7000
560 Optimization terminated successfully.
561     Current function value: 11637.068158
562     Iterations: 6544
563     Function evaluations: 7192
564
565 10 largest Differences in logl according to simplex
before termination:
566 [0.00092902 0.00093238 0.00094085 0.00094335 0.00094999 0
.00095113
567 0.00095223 0.0009539 0.00095427 0.00096038]
568
569 10 largest Differences in logl according to simplex at
termination:
570 [0.00094995 0.00095331 0.00096179 0.00096429 0.00097092 0
.00097206
571 0.00097316 0.00097483 0.0009752 0.00098132]
572
573 10 largest Differences in x according to simplex before
termination:
574 [0.06811384 0.07013507 0.07046672 0.07081299 0.07343534 0
.07416308
575 0.08245085 0.09662069 0.10360088 0.11062255]
576
577 10 largest Differences in x according to simplex at
termination:
578 [0.06205395 0.06370303 0.06654955 0.07137418 0.07917657 0
.08158439
579 0.0858014 0.08913176 0.09067465 0.09373019]
580 Finished iteration 5, duration M step 0:07:14
581 [ 3.37876371e-03 -1.07073067e-01 -8.58824159e-01 1.
10024895e-04
582 1.26431297e-02 1.67579516e-02 -6.34973182e-13 -4.
09130145e+00
583 1.34504694e+00 -3.10272942e-03 4.14039500e-03 -8.
79409643e-05
```

584	-5.23416866e-06	-2.26679485e+00	1.88040248e-05	1.
	17176393e-03			
585	-8.13864167e-05	9.47679553e-03	4.85454866e-08	2.
	70383055e+00			
586	1.46087644e-03	-8.84479157e-06	-3.75359476e-02	2.
	77304339e+01			
587	2.12436287e-03	2.36166305e+01	-1.63371441e-09	6.
	83126530e+00			
588	-1.24474979e+00	3.37517344e-01	2.83105133e-03	3.
	49165227e+00			
589	2.79361569e-14	1.48517405e+00	-3.19782801e+00	1.
	36464345e-01			
590	-2.61238075e+00	-3.49609768e-04	-4.58653074e-01	1.
	75884266e-02			
591	-4.28539476e-08	1.85007250e+00	2.57573286e-05	2.
	43263995e-06			
592	-3.19006952e-03	3.41635194e-05	4.27879180e+00	1.
	53857034e-06			
593	3.36459291e-05	1.64661913e+01	-7.07559237e-08	7.
	11582676e-12			
594	1.00092014e+01	-9.58277720e-01	1.54507477e+01	-1.
	34093200e+00			
595	2.56011388e-01	-4.52000678e-07	1.10239896e+00	1.
	02664831e-04			
596	-2.04856122e-02	-1.16283039e+00	1.76396133e+00	-1.
	93937195e-01			
597	-6.02531449e-03	7.07895573e-02	-6.11576870e-03	-7.
	99698654e-06			
598	1.42531160e+00	-5.21073746e-05	-2.33409379e-05	1.
	40899510e-05			
599	-1.99159388e-03	3.52183818e+00	-5.90580445e-04	-5.
	66718364e-03			
600	-9.90980877e-10	5.32849085e-11	-1.24540118e+01	4.
	15248357e-10			
601	-1.56396215e+01	8.70902366e-04	3.35821988e-05	-1.
	60896859e+00			
602	1.18138640e-02	4.06104147e-03	-7.06895978e-03	1.
	70407855e-04			
603	4.04872385e-02	2.47900929e+00	3.98403503e+00	9.
	71329583e+00			
604	-3.50230758e-03	-2.96706720e-02	1.54814990e+00	3.
	38180657e-03			
605	-7.41706106e-08	7.29732851e-08	3.98841806e-04	1.
	41831852e-03			
606	5.73152422e-04	-3.71083644e+00	-2.20507638e-02	1.
	27450742e+00			

607	3.19725755e-04	-9.96267390e-01	-1.01854657e-05	4.
	82965736e-08			
608	4.72380233e-05	1.37075594e-04	2.92283983e-01	-2.
	73012313e-02			
609	4.26544609e-04	-1.26215466e-04	1.19931822e-02	3.
	00195780e-04			
610	-7.88575000e-05	-2.58787680e-03	3.95030811e-04	1.
	50305081e+00			
611	-1.46667982e-01	-9.94109398e-03	4.81405292e-12	3.
	09060979e-04			
612	1.66980001e-04	3.42660775e-05	9.92455356e-09	1.
	11268751e-10			
613	2.40241276e-05	-1.04742649e+00	-9.87980837e-08	7.
	62864101e-05			
614	-2.25759307e-06	-5.53175385e-07	2.03895216e-09	-4.
	19004881e-06			
615	5.80842468e-02	-9.69890967e-03	8.61336329e-05	-8.
	69048860e-06			
616	1.76949811e+01	1.92231908e+01	-1.20167621e-01	1.
	60247226e+01			
617	1.53352264e+01	1.82179031e+00	1.73913834e-06	2.
	29718779e-04			
618	-1.52128178e-05	9.79026338e-08	7.56078001e-01	2.
	90720064e-02			
619	1.15965090e-04	-2.15042498e-04	-1.58851149e-03	-1.
	16091353e-02			
620	4.21295457e-03	-3.41150116e-06	-7.26494436e-03	-1.
	83341221e-04			
621	-4.51051166e-03	9.54093323e-05	4.51885463e-02	-1.
	06104920e-02			
622	3.79195132e-07	-4.35328210e-06	1.16847399e-04	-5.
	89787660e-13			
623	-1.34482034e+01	6.42779319e-11	-1.96510823e-01	9.
	58837443e+00			
624	8.43269859e+00	-7.38070361e+00	-9.02366101e-04	-4.
	36941263e-01			
625	6.98213537e-01	-6.33715212e+00	1.06608752e+01	1.
	27784883e+01			
626	-3.44001546e-04	1.15348246e-01	-5.53947234e-01	8.
	48781420e-01			
627	-5.52152805e-01	-1.06034125e+01	-7.11820414e+00	-1.
	88211055e+01			
628	1.33626820e+00	-2.46363986e-01	-9.83319859e+00	-9.
	46538151e+00			
629	-9.25367962e-01	-4.40542506e+00	7.31073535e+00	1.
	36358389e+00			

```
630 -4.59230636e-01 -1.70327061e+00 -2.08479578e+00]
631 norm absolute difference alpha: 0.016885168235254093
632 norm absolute difference beta: 0.3742709308994213
633 LogLikelihood value: 11603.701903904606
634 Difference LogLikelihood value: -0.20235257653439476
635 E-step duration: 0:00:05
636 function value: 11636.134684447621 at iteration 1000
637 function value: 11636.129711211355 at iteration 2000
638 function value: 11636.127374557344 at iteration 3000
639 function value: 11636.124316338753 at iteration 4000
640 Optimization terminated successfully.
641         Current function value: 11636.119526
642         Iterations: 4384
643         Function evaluations: 4966
644
645 10 largest Differences in logl according to simplex
before termination:
646 [0.00105463 0.00105655 0.00106506 0.00106548 0.00107697 0
.00108044
647 0.00110634 0.00110758 0.00111295 0.00112023]
648
649 10 largest Differences in logl according to simplex at
termination:
650 [0.0015691 0.00157103 0.00157953 0.00157996 0.00159145 0
.00159491
651 0.00162082 0.00162205 0.00162743 0.00163471]
652
653 10 largest Differences in x according to simplex before
termination:
654 [0.0660817 0.06749617 0.06814445 0.07217492 0.08331154 0
.08343472
655 0.08427865 0.09787239 0.09834258 0.10003404]
656
657 10 largest Differences in x according to simplex at
termination:
658 [0.06326387 0.06453564 0.06587351 0.0738115 0.0772491 0
.07796046
659 0.07951872 0.09259899 0.09307688 0.09820389]
660 Finished iteration 6, duration M step 0:04:59
661 [ 3.37742197e-03 -1.05801105e-01 -8.57085916e-01 1.
08781325e-04
662 1.27768334e-02 1.73055788e-02 -6.31157594e-13 -4.
10723802e+00
663 1.31331078e+00 -3.11182590e-03 4.17757593e-03 -8.
70360728e-05
664 -5.19235209e-06 -2.28692742e+00 1.88398596e-05 1.
```

664	17564781e-03				
665	-8.02042740e-05	9.54962699e-03	4.83799315e-08	2.	
	70840888e+00				
666	1.45763399e-03	-8.84388967e-06	-4.01025957e-02	2.	
	77479493e+01				
667	2.12169030e-03	2.36152702e+01	-1.63707416e-09	6.	
	83265367e+00				
668	-1.24463602e+00	3.37592895e-01	2.83511253e-03	3.	
	47031688e+00				
669	2.78687373e-14	1.49046744e+00	-3.20137595e+00	1.	
	35652385e-01				
670	-2.61249876e+00	-3.48331411e-04	-4.52525368e-01	1.	
	93717949e-02				
671	-4.28377965e-08	1.85348993e+00	2.55868616e-05	2.	
	42671680e-06				
672	-3.21125342e-03	3.38825193e-05	4.28919552e+00	1.	
	57733639e-06				
673	3.33303679e-05	1.65360918e+01	-7.04985648e-08	7.	
	08900698e-12				
674	1.00090416e+01	-9.56580043e-01	1.54902939e+01	-1.	
	33852394e+00				
675	2.53997998e-01	-4.48781479e-07	1.08759330e+00	1.	
	01936722e-04				
676	-2.05178323e-02	-1.17822982e+00	1.76369339e+00	-1.	
	91119248e-01				
677	-6.08057271e-03	6.79761715e-02	-6.15363792e-03	-8.	
	00599387e-06				
678	1.40609229e+00	-5.16810915e-05	-2.31243478e-05	1.	
	39850188e-05				
679	-1.99724531e-03	3.49933115e+00	-5.89692020e-04	-5.	
	64086772e-03				
680	-9.86447536e-10	5.31176621e-11	-1.24619596e+01	4.	
	13635461e-10				
681	-1.57056853e+01	8.67148677e-04	3.34346289e-05	-1.	
	61533366e+00				
682	1.19309307e-02	3.85951588e-03	-7.04856996e-03	1.	
	68894246e-04				
683	4.08180722e-02	2.46378238e+00	3.97614425e+00	9.	
	69886284e+00				
684	-3.51975134e-03	-2.86702395e-02	1.55587114e+00	3.	
	37308701e-03				
685	-7.43654495e-08	7.29784528e-08	3.99790768e-04	1.	
	40585094e-03				
686	5.71732845e-04	-3.85707700e+00	-2.19361537e-02	1.	
	25848990e+00				
687	3.18138082e-04	-9.84371519e-01	-1.01032953e-05	4.	

687	80293716e-08				
688	4.69595624e-05	1.36231756e-04	3.10019672e-01	-2.	
	78526526e-02				
689	4.25686524e-04	-1.25758661e-04	1.30292673e-02	3.	
	04330854e-04				
690	-7.86457616e-05	-2.60997504e-03	3.92984425e-04	1.	
	47275575e+00				
691	-1.44730288e-01	-9.19087689e-03	4.79968615e-12	3.	
	08461881e-04				
692	1.66671712e-04	3.42236937e-05	9.89150789e-09	1.	
	10500076e-10				
693	2.38627998e-05	-1.02477635e+00	-9.71365477e-08	7.	
	58093882e-05				
694	-2.24693852e-06	-5.49579735e-07	2.02827997e-09	-4.	
	17247912e-06				
695	5.75356400e-02	-9.64050143e-03	8.57996288e-05	-8.	
	97749059e-06				
696	1.78147119e+01	1.91507482e+01	-1.48629097e-01	1.	
	60466899e+01				
697	1.54763383e+01	1.81646495e+00	1.73227911e-06	2.	
	28519175e-04				
698	-1.51107180e-05	9.76902622e-08	7.48941247e-01	2.	
	92620221e-02				
699	1.15545818e-04	-2.13002214e-04	-1.58108284e-03	-1.	
	15715026e-02				
700	4.22606545e-03	-3.38123074e-06	-7.25793106e-03	-1.	
	75890580e-04				
701	-4.54188413e-03	9.44339324e-05	4.50614905e-02	-1.	
	05883107e-02				
702	3.77808081e-07	-4.34584999e-06	1.16126430e-04	-5.	
	88168987e-13				
703	-1.33959833e+01	6.40543198e-11	-1.94854301e-01	9.	
	59006924e+00				
704	8.43451142e+00	-7.36076830e+00	-9.10165302e-04	-4.	
	38572974e-01				
705	6.98130863e-01	-6.37706647e+00	1.06608585e+01	1.	
	27779513e+01				
706	-3.45613801e-04	1.15941666e-01	-5.54041434e-01	8.	
	48820634e-01				
707	-5.52105085e-01	-1.06438425e+01	-7.15064796e+00	-1.	
	88759487e+01				
708	1.33482587e+00	-2.46667015e-01	-9.86955978e+00	-9.	
	46997748e+00				
709	-9.25211542e-01	-4.40469365e+00	7.31172829e+00	1.	
	36389195e+00				
710	-4.58768952e-01	-1.70372348e+00	-2.08411664e+00]		

```
711 norm absolute difference alpha: 0.017461235198750213
712 norm absolute difference beta: 0.2288542493277984
713 LogLikelihood value: 11603.556576725126
714 Difference LogLikelihood value: -0.14532717947986384
715 E-step duration: 0:00:05
716 function value: 11635.392070777665 at iteration 1000
717 function value: 11635.381902265015 at iteration 2000
718 function value: 11635.378440561646 at iteration 3000
719 function value: 11635.374017035838 at iteration 4000
720 function value: 11635.370432043335 at iteration 5000
721 function value: 11635.36558648434 at iteration 6000
722 Optimization terminated successfully.
723     Current function value: 11635.363467
724     Iterations: 6307
725     Function evaluations: 6901
726
727 10 largest Differences in logl according to simplex
before termination:
728 [0.00094738 0.00094785 0.00095481 0.00095691 0.00096681 0
.00096923
729 0.00097054 0.00097148 0.00097467 0.00097468]
730
731 10 largest Differences in logl according to simplex at
termination:
732 [0.00110674 0.00110721 0.00111417 0.00111627 0.00112617 0
.00112858
733 0.0011299 0.00113084 0.00113403 0.00113404]
734
735 10 largest Differences in x according to simplex before
termination:
736 [0.06781092 0.07458698 0.07487418 0.07915185 0.08320921 0
.09039478
737 0.09071564 0.09676384 0.09872148 0.11386373]
738
739 10 largest Differences in x according to simplex at
termination:
740 [0.07111998 0.07473667 0.0763804 0.0816204 0.08307772 0
.08802671
741 0.08977155 0.09469046 0.09696942 0.09959991]
742 Finished iteration 7, duration M step 0:06:51
743 [ 3.40571590e-03 -1.04668667e-01 -8.51206689e-01 1.
08818467e-04
744 1.28031511e-02 1.75365785e-02 -5.81157952e-13 -4.
14626409e+00
745 1.28610310e+00 -3.17924327e-03 4.26579781e-03 -7.
84269639e-05
```

746	-5.07853543e-06	-2.30817557e+00	1.83710393e-05	1.
	17642924e-03			
747	-8.18276385e-05	9.68500085e-03	4.70610831e-08	2.
	68649676e+00			
748	1.39296842e-03	-8.63325529e-06	-4.30263128e-02	2.
	77345810e+01			
749	2.14376417e-03	2.36340375e+01	-1.57395554e-09	6.
	82987247e+00			
750	-1.24471884e+00	3.37096155e-01	2.89935791e-03	3.
	46090589e+00			
751	2.37253455e-14	1.49816245e+00	-3.18880487e+00	1.
	34859714e-01			
752	-2.61122633e+00	-3.51233283e-04	-4.48031897e-01	1.
	92505908e-02			
753	-4.17879997e-08	1.84775585e+00	2.54688354e-05	2.
	24701898e-06			
754	-3.27380010e-03	3.37938868e-05	4.29544536e+00	1.
	54956239e-06			
755	3.29777948e-05	1.65101788e+01	-6.74645615e-08	6.
	91356093e-12			
756	1.00021100e+01	-9.62231545e-01	1.55250322e+01	-1.
	33737458e+00			
757	2.49477572e-01	-5.89052792e-07	1.04860820e+00	1.
	00854835e-04			
758	-2.05414760e-02	-1.19290278e+00	1.73237214e+00	-1.
	90841114e-01			
759	-6.16650057e-03	6.92843748e-02	-6.26246663e-03	-7.
	93223403e-06			
760	1.41003605e+00	-5.11320922e-05	-2.30547966e-05	1.
	40015663e-05			
761	-1.96779900e-03	3.51750532e+00	-5.93008219e-04	-5.
	37817169e-03			
762	-9.43436272e-10	5.57569667e-11	-1.24314220e+01	4.
	02807799e-10			
763	-1.56229649e+01	8.36796446e-04	3.33604230e-05	-1.
	63088373e+00			
764	1.19286047e-02	3.87831209e-03	-7.18038809e-03	1.
	68655291e-04			
765	3.89926919e-02	2.47723584e+00	3.97451210e+00	9.
	71232541e+00			
766	-3.55653747e-03	-2.65221564e-02	1.54705685e+00	3.
	33034385e-03			
767	-7.27331696e-08	7.72593811e-08	3.98328532e-04	1.
	40954580e-03			
768	5.71095071e-04	-4.29868765e+00	-2.14948378e-02	1.
	22121249e+00			

769	3.24028524e-04	-9.92602378e-01	-1.01433567e-05	4.
	19279385e-08			
770	4.67943797e-05	1.48063577e-04	3.34864824e-01	-2.
	82564798e-02			
771	4.17417136e-04	-1.26616580e-04	1.31332250e-02	3.
	06535092e-04			
772	-7.91549710e-05	-2.66616268e-03	3.96770298e-04	1.
	42351828e+00			
773	-1.34833614e-01	-9.23461648e-03	5.16977072e-12	3.
	10815396e-04			
774	1.68257041e-04	3.76445259e-05	9.63992894e-09	1.
	09291463e-10			
775	2.39025805e-05	-1.00922924e+00	-9.31893801e-08	7.
	47044627e-05			
776	-2.21164932e-06	-6.09668039e-07	1.96931576e-09	-4.
	16846110e-06			
777	5.87275684e-02	-9.64573567e-03	8.46551592e-05	-9.
	04143325e-06			
778	1.80470062e+01	1.93286162e+01	-2.02283067e-01	1.
	62213869e+01			
779	1.56132341e+01	1.81056497e+00	1.71811717e-06	2.
	30821757e-04			
780	-1.50596476e-05	9.47957601e-08	7.46766664e-01	2.
	98361395e-02			
781	1.14026024e-04	-2.11621240e-04	-1.59457751e-03	-1.
	13920635e-02			
782	4.24539530e-03	-3.36500586e-06	-7.33622510e-03	-1.
	73906053e-04			
783	-4.59230549e-03	9.41787178e-05	4.52061022e-02	-1.
	07116630e-02			
784	3.50501316e-07	-4.63635443e-06	1.16139755e-04	-5.
	95226459e-13			
785	-1.34651136e+01	6.23120580e-11	-1.98992099e-01	9.
	59381097e+00			
786	8.43942653e+00	-7.37523529e+00	-9.23609137e-04	-4.
	41594908e-01			
787	6.93180487e-01	-6.34844957e+00	1.06599420e+01	1.
	27778147e+01			
788	-3.44123209e-04	1.13932436e-01	-5.53770453e-01	8.
	49718830e-01			
789	-5.51994034e-01	-1.06205305e+01	-7.15956876e+00	-1.
	88482959e+01			
790	1.33415911e+00	-2.47493235e-01	-9.82734598e+00	-9.
	44371120e+00			
791	-9.24432151e-01	-4.40444174e+00	7.31157574e+00	1.
	36474267e+00			

```
792 -4.58172255e-01 -1.70416571e+00 -2.08437411e+00]
793 norm absolute difference alpha: 0.010565688685745539
794 norm absolute difference beta: 0.1945729105648083
795 LogLikelihood value: 11603.40466051771
796 Difference LogLikelihood value: -0.1519162074164342
797 E-step duration: 0:00:05
798 function value: 11634.596864861956 at iteration 1000
799 function value: 11634.58869249753 at iteration 2000
800 function value: 11634.586088984704 at iteration 3000
801 function value: 11634.582293847006 at iteration 4000
802 Optimization terminated successfully.
803             Current function value: 11634.579299
804             Iterations: 4045
805             Function evaluations: 4619
806
807 10 largest Differences in logl according to simplex
before termination:
808 [0.00106821 0.00106947 0.00107396 0.00107686 0.00108415 0
.00108578
809 0.00108684 0.00109009 0.00109208 0.00109833]
810
811 10 largest Differences in logl according to simplex at
termination:
812 [0.00137836 0.00137962 0.0013841 0.00138701 0.00139429 0
.00139593
813 0.00139699 0.00140023 0.00140223 0.00140847]
814
815 10 largest Differences in x according to simplex before
termination:
816 [0.07735137 0.0824083 0.08366978 0.08411823 0.08580193 0
.08949943
817 0.0906825 0.09639981 0.10171125 0.10202053]
818
819 10 largest Differences in x according to simplex at
termination:
820 [0.0829135 0.08500776 0.08651245 0.08743536 0.09277196 0
.09338863
821 0.09551092 0.09561267 0.09658253 0.0979868 ]
822 Finished iteration 8, duration M step 0:04:51
823 [ 3.53383543e-03 -1.04140270e-01 -8.50523739e-01 1.
09680083e-04
824 1.28455306e-02 1.75448532e-02 -5.75143851e-13 -4.
15668587e+00
825 1.27949831e+00 -3.17672271e-03 4.25765560e-03 -7.
90796712e-05
826 -5.07228861e-06 -2.32274444e+00 1.82037343e-05 1.
```

826	17589767e-03				
827	-7.91630525e-05	9.68898515e-03	4.66370733e-08	2.	
	67145949e+00				
828	1.38983055e-03	-8.58652083e-06	-4.30930859e-02	2.	
	77248874e+01				
829	2.14377300e-03	2.36345416e+01	-1.55879646e-09	6.	
	83146336e+00				
830	-1.24491956e+00	3.37084371e-01	2.93497271e-03	3.	
	45887327e+00				
831	2.35632907e-14	1.49855469e+00	-3.18653040e+00	1.	
	30709742e-01				
832	-2.61159775e+00	-3.47727541e-04	-4.48546286e-01	1.	
	92749248e-02				
833	-4.15493841e-08	1.84385800e+00	2.54623423e-05	2.	
	22948020e-06				
834	-3.26163883e-03	3.50639842e-05	4.29575197e+00	1.	
	54189665e-06				
835	3.31887200e-05	1.65104348e+01	-6.70382453e-08	6.	
	89724853e-12				
836	1.00062312e+01	-9.65004377e-01	1.55374464e+01	-1.	
	33813563e+00				
837	2.47416887e-01	-5.83897868e-07	1.05031258e+00	9.	
	95751097e-05				
838	-2.05185986e-02	-1.20064786e+00	1.73223871e+00	-1.	
	89395484e-01				
839	-6.16590798e-03	6.93998649e-02	-6.25639847e-03	-7.	
	86892376e-06				
840	1.41174415e+00	-4.88986831e-05	-2.30562044e-05	1.	
	37317326e-05				
841	-1.96897396e-03	3.51994480e+00	-6.46939578e-04	-5.	
	37121502e-03				
842	-9.35831486e-10	5.50899344e-11	-1.24534019e+01	3.	
	99536928e-10				
843	-1.56437519e+01	8.30077223e-04	3.34995310e-05	-1.	
	63389456e+00				
844	1.19073120e-02	3.89356043e-03	-7.15307326e-03	1.	
	70151795e-04				
845	3.89789433e-02	2.46995925e+00	3.98166588e+00	9.	
	70641685e+00				
846	-3.53967705e-03	-2.66001371e-02	1.55599136e+00	3.	
	30596225e-03				
847	-7.20575409e-08	7.66036975e-08	3.96690025e-04	1.	
	40175119e-03				
848	5.69243406e-04	-4.36003437e+00	-2.14384947e-02	1.	
	20218704e+00				
849	3.23290776e-04	-9.68803887e-01	-1.03633418e-05	4.	

849	17204037e-08			
850	4.71586773e-05	1.48410899e-04	3.44680892e-01	-2.
	83163221e-02			
851	4.16808419e-04	-1.24952397e-04	1.31344354e-02	3.
	05086696e-04			
852	-7.81860687e-05	-2.66846188e-03	4.02446506e-04	1.
	40320467e+00			
853	-1.31641321e-01	-9.21135341e-03	5.16455031e-12	3.
	22548187e-04			
854	1.65812080e-04	3.77241298e-05	9.61956416e-09	1.
	07974162e-10			
855	2.40706820e-05	-9.94393166e-01	-9.25054653e-08	7.
	43595813e-05			
856	-2.19395548e-06	-6.04904671e-07	1.95532397e-09	-4.
	15398227e-06			
857	5.84249869e-02	-9.58866616e-03	8.48804029e-05	-9.
	02831924e-06			
858	1.80582371e+01	1.94080016e+01	-2.59351642e-01	1.
	62826674e+01			
859	1.56965484e+01	1.80537289e+00	1.70399417e-06	2.
	28592187e-04			
860	-1.51500439e-05	9.39932771e-08	7.44015471e-01	2.
	97033767e-02			
861	1.13694869e-04	-2.12733692e-04	-1.58640515e-03	-1.
	13946090e-02			
862	4.14890441e-03	-3.32595930e-06	-7.33832295e-03	-1.
	74226740e-04			
863	-4.57921385e-03	9.89216763e-05	4.52498472e-02	-1.
	07085014e-02			
864	3.48279502e-07	-4.60746619e-06	1.16225771e-04	-5.
	91931504e-13			
865	-1.34575400e+01	6.22898358e-11	-1.96414969e-01	9.
	59302213e+00			
866	8.43970908e+00	-7.38741257e+00	-9.23361294e-04	-4.
	42391612e-01			
867	6.93665023e-01	-6.35180966e+00	1.06597399e+01	1.
	27775515e+01			
868	-3.43597165e-04	1.13720798e-01	-5.53996201e-01	8.
	49773672e-01			
869	-5.52338608e-01	-1.06132042e+01	-7.15526568e+00	-1.
	88370561e+01			
870	1.33401685e+00	-2.47702755e-01	-9.84673164e+00	-9.
	46702262e+00			
871	-9.24195973e-01	-4.40479419e+00	7.31122270e+00	1.
	36508887e+00			
872	-4.57916231e-01	-1.70442899e+00	-2.08442062e+00]	

```
873 norm absolute difference alpha: 0.014820746855936375
874 norm absolute difference beta: 0.25455074208309847
875 LogLikelihood value: 11603.31638789417
876 Difference LogLikelihood value: -0.08827262353952392
877 E-step duration: 0:00:05
878 function value: 11633.982366901038 at iteration 1000
879 Optimization terminated successfully.
880     Current function value: 11633.975373
881     Iterations: 1264
882     Function evaluations: 1776
883
884 10 largest Differences in logl according to simplex
before termination:
885 [0.00067697 0.00067752 0.00067796 0.00067872 0.00067874 0
.00067911
886 0.00068084 0.00068165 0.00068278 0.00068297]
887
888 10 largest Differences in logl according to simplex at
termination:
889 [0.00173127 0.00173182 0.00173226 0.00173302 0.00173304 0
.00173341
890 0.00173514 0.00173596 0.00173709 0.00173727]
891
892 10 largest Differences in x according to simplex before
termination:
893 [0.06202605 0.06399298 0.07412666 0.07592803 0.09006545 0
.09480832
894 0.09566511 0.09598375 0.09679228 0.09908856]
895
896 10 largest Differences in x according to simplex at
termination:
897 [0.06543581 0.06768821 0.06960206 0.07242479 0.07753149 0
.07948572
898 0.07972764 0.08423954 0.08710755 0.0944722 ]
899 Finished iteration 9, duration M step 0:01:51
900 [ 3.53085756e-03 -1.04087144e-01 -8.50368336e-01 1.
09591200e-04
901 1.28402660e-02 1.75322464e-02 -5.74930329e-13 -4.
15706355e+00
902 1.27875060e+00 -3.17411287e-03 4.25419195e-03 -7.
91206920e-05
903 -5.07089356e-06 -2.32261825e+00 1.82205942e-05 1.
17489940e-03
904 -7.91985009e-05 9.68113835e-03 4.66514343e-08 2.
66890115e+00
905 1.38853703e-03 -8.57974891e-06 -4.30774918e-02 2.
```

905	77315386e+01					
906	2.14196682e-03	2.36363602e+01	-1.55844575e-09	6.		
	83185483e+00					
907	-1.24487201e+00	3.37182486e-01	2.93265977e-03	3.		
	45824958e+00					
908	2.35586829e-14	1.49866391e+00	-3.18688941e+00	1.		
	30659049e-01					
909	-2.61129491e+00	-3.47429261e-04	-4.48323216e-01	1.		
	92616580e-02					
910	-4.15682680e-08	1.84379310e+00	2.54594538e-05	2.		
	23271066e-06					
911	-3.25854303e-03	3.50354511e-05	4.29581715e+00	1.		
	54068416e-06					
912	3.31615882e-05	1.65106732e+01	-6.70955693e-08	6.		
	89346677e-12					
913	1.00052932e+01	-9.64409801e-01	1.55399289e+01	-1.		
	33817987e+00					
914	2.47112487e-01	-5.84556291e-07	1.04999393e+00	9.		
	94925551e-05					
915	-2.05055472e-02	-1.20015299e+00	1.73106747e+00	-1.		
	89271285e-01					
916	-6.16099229e-03	6.93549792e-02	-6.25131409e-03	-7.		
	86325589e-06					
917	1.41096929e+00	-4.88996507e-05	-2.30518224e-05	1.		
	37285252e-05					
918	-1.96730555e-03	3.51860147e+00	-6.46391716e-04	-5.		
	36586276e-03					
919	-9.35464964e-10	5.50808830e-11	-1.24563799e+01	3.		
	99565089e-10					
920	-1.56471506e+01	8.29269734e-04	3.35100321e-05	-1.		
	63132211e+00					
921	1.18984181e-02	3.89149886e-03	-7.14803998e-03	1.		
	70194334e-04					
922	3.89621941e-02	2.46866051e+00	3.98108933e+00	9.		
	70681382e+00					
923	-3.53675553e-03	-2.65111377e-02	1.56525992e+00	3.		
	30282720e-03					
924	-7.20162550e-08	7.65539835e-08	3.96303794e-04	1.		
	40030183e-03					
925	5.68753230e-04	-4.37059970e+00	-2.14245666e-02	1.		
	20388718e+00					
926	3.23018645e-04	-9.67182281e-01	-1.03652999e-05	4.		
	17532170e-08					
927	4.71621614e-05	1.48285851e-04	3.45340089e-01	-2.		
	82979887e-02					
928	4.16460039e-04	-1.24846836e-04	1.31248082e-02	3.		

```

928 04827953e-04
929 -7.81207143e-05 -2.66624082e-03 4.02098645e-04 1.
39492791e+00
930 -1.32502273e-01 -9.20214190e-03 5.16165108e-12 3.
22278012e-04
931 1.65673775e-04 3.76925638e-05 9.62204727e-09 1.
07972458e-10
932 2.40798140e-05 -9.94717492e-01 -9.26025885e-08 7.
42930733e-05
933 -2.19236311e-06 -6.05728129e-07 1.95563831e-09 -4.
15239218e-06
934 5.83781188e-02 -9.58111569e-03 8.48119630e-05 -9.
02016942e-06
935 1.80585067e+01 1.94045264e+01 -2.86289851e-01 1.
62806212e+01
936 1.56954517e+01 1.80525781e+00 1.70276099e-06 2.
28397753e-04
937 -1.51520172e-05 9.40460642e-08 7.43745442e-01 2.
96760532e-02
938 1.13587667e-04 -2.12859682e-04 -1.58508095e-03 -1.
13874239e-02
939 4.14558082e-03 -3.32480755e-06 -7.33350759e-03 -1.
74083109e-04
940 -4.57543892e-03 9.89185050e-05 4.52296145e-02 -1.
07013002e-02
941 3.48530393e-07 -4.60554327e-06 1.16127245e-04 -5.
91738850e-13
942 -1.34619471e+01 6.22865281e-11 -1.96250639e-01 9.
59311702e+00
943 8.43812868e+00 -7.38623477e+00 -9.22646785e-04 -4.
42650049e-01
944 6.93702998e-01 -6.35175703e+00 1.06596487e+01 1.
27776278e+01
945 -3.43304382e-04 1.13721890e-01 -5.54079337e-01 8.
49829470e-01
946 -5.52307134e-01 -1.06158374e+01 -7.15464187e+00 -1.
88473697e+01
947 1.33392255e+00 -2.47700785e-01 -9.84737311e+00 -9.
46419742e+00
948 -9.24286353e-01 -4.40470202e+00 7.31121421e+00 1.
36513929e+00
949 -4.57886438e-01 -1.70443759e+00 -2.08438380e+00]
950 norm absolute difference alpha: 0.006964377662240739
951 norm absolute difference beta: 0.17347291141443705
952 LogLikelihood value: 11603.279553547305
953 Difference LogLikelihood value: -0.03683434686536202

```

```
954 E-step duration: 0:00:04
955 function value: 11633.590626033283 at iteration 1000
956 function value: 11633.585514240704 at iteration 2000
957 function value: 11633.58098028663 at iteration 3000
958 function value: 11633.576801340621 at iteration 4000
959 Optimization terminated successfully.
960         Current function value: 11633.570386
961         Iterations: 4387
962         Function evaluations: 4894
963
964 10 largest Differences in logl according to simplex
before termination:
965 [0.001528  0.00152928  0.00153294  0.00154019  0.0015574  0
.00155833
966 0.0015596  0.00157885  0.0015875   0.00158799]
967
968 10 largest Differences in logl according to simplex at
termination:
969 [0.00201191 0.00201319 0.00201685 0.0020241  0.00204132 0
.00204225
970 0.00204352 0.00206276 0.00207142 0.00207191]
971
972 10 largest Differences in x according to simplex before
termination:
973 [0.0756653  0.08028716  0.08035038  0.08119212  0.08373136 0
.08576958
974 0.08711712 0.09781167 0.09943659 0.10154959]
975
976 10 largest Differences in x according to simplex at
termination:
977 [0.07656896 0.0815882  0.08178364 0.08340829 0.08560572 0
.08696394
978 0.09203852 0.09264743 0.09622888 0.09662928]
979 Finished iteration 10, duration M step 0:05:01
980 [ 3.50152221e-03 -1.00801299e-01 -8.52073106e-01  1.
05781450e-04
981 1.27228333e-02 1.78248332e-02 -5.77609256e-13 -4.
16911004e+00
982 1.26840494e+00 -3.17214123e-03 4.47250680e-03 -7.
88142299e-05
983 -5.03677245e-06 -2.34106848e+00 1.80925887e-05 1.
16868543e-03
984 -7.87817564e-05 1.00056169e-02 4.62802132e-08 2.
67641058e+00
985 1.38547908e-03 -8.58417829e-06 -4.29219441e-02 2.
77345500e+01
```

986	2.20564135e-03	2.36361820e+01	-1.58569013e-09	6.
	83021893e+00			
987	-1.24512704e+00	3.37800774e-01	2.93180597e-03	3.
	45697247e+00			
988	2.34083682e-14	1.49993042e+00	-3.18394459e+00	1.
	29670040e-01			
989	-2.61121835e+00	-3.43916758e-04	-4.46917212e-01	1.
	92937904e-02			
990	-4.12404548e-08	1.84626756e+00	2.52675687e-05	2.
	21772197e-06			
991	-3.26143414e-03	3.65731196e-05	4.29498798e+00	1.
	53743378e-06			
992	3.26769589e-05	1.65468751e+01	-6.66602133e-08	6.
	85034235e-12			
993	9.99865742e+00	-9.68391693e-01	1.55518843e+01	-1.
	33771680e+00			
994	2.47086770e-01	-5.83261582e-07	1.03702168e+00	9.
	68648635e-05			
995	-2.04796685e-02	-1.20684770e+00	1.73053783e+00	-1.
	86929683e-01			
996	-6.16393387e-03	6.69533442e-02	-6.17750001e-03	-7.
	87305981e-06			
997	1.40157158e+00	-4.84078041e-05	-2.28470457e-05	1.
	36147177e-05			
998	-1.96891192e-03	3.52600988e+00	-6.44853474e-04	-5.
	34237653e-03			
999	-9.35829256e-10	5.61257656e-11	-1.24689865e+01	3.
	96134409e-10			
1000	-1.56845751e+01	8.26800002e-04	3.32487852e-05	-1.
	65162113e+00			
1001	1.11095358e-02	4.28473411e-03	-7.13704527e-03	1.
	69088416e-04			
1002	3.78991512e-02	2.48954067e+00	3.99600191e+00	9.
	71397164e+00			
1003	-3.51222362e-03	-2.59334582e-02	1.56875868e+00	3.
	28918239e-03			
1004	-7.22351235e-08	7.68109696e-08	3.95294292e-04	1.
	39656589e-03			
1005	5.67002443e-04	-4.48932733e+00	-2.05429641e-02	1.
	16383693e+00			
1006	3.19230264e-04	-9.88320524e-01	-1.02819636e-05	4.
	20141754e-08			
1007	4.67603523e-05	1.45713385e-04	3.54450978e-01	-2.
	84657407e-02			
1008	4.19561945e-04	-1.24341359e-04	1.31527790e-02	3.
	01467892e-04			

1009	-7.80188682e-05	-2.66671313e-03	3.97720938e-04	1.
	37635169e+00			
1010	-1.23959646e-01	-9.16998359e-03	5.14822003e-12	3.
	07309876e-04			
1011	1.72854115e-04	3.70996595e-05	9.55173025e-09	1.
	08108165e-10			
1012	2.39742036e-05	-9.67220987e-01	-9.19839583e-08	7.
	40037813e-05			
1013	-2.18123933e-06	-6.00765509e-07	1.94006761e-09	-4.
	14955299e-06			
1014	5.80966011e-02	-9.63694482e-03	8.44666779e-05	-8.
	98506235e-06			
1015	1.81189136e+01	1.94600443e+01	-3.84970317e-01	1.
	63682854e+01			
1016	1.57521984e+01	1.80503914e+00	1.69724284e-06	2.
	26068686e-04			
1017	-1.51101697e-05	9.45294682e-08	7.34052714e-01	2.
	97330700e-02			
1018	1.13616636e-04	-2.11787372e-04	-1.56671345e-03	-1.
	13720785e-02			
1019	4.53681275e-03	-3.28770211e-06	-7.40515355e-03	-1.
	71103082e-04			
1020	-4.55905483e-03	9.80998334e-05	4.37361730e-02	-1.
	08092600e-02			
1021	3.44418743e-07	-4.60743049e-06	1.14837772e-04	-5.
	87687686e-13			
1022	-1.34767610e+01	6.21531857e-11	-1.95027335e-01	9.
	59245156e+00			
1023	8.43504356e+00	-7.38646997e+00	-9.95838237e-04	-4.
	43146843e-01			
1024	6.93578813e-01	-6.36276543e+00	1.06593798e+01	1.
	27775895e+01			
1025	-3.41839364e-04	1.13608665e-01	-5.54336693e-01	8.
	49875116e-01			
1026	-5.52163304e-01	-1.06432072e+01	-7.15278210e+00	-1.
	88696851e+01			
1027	1.33369013e+00	-2.48007345e-01	-9.85315893e+00	-9.
	45357623e+00			
1028	-9.24071470e-01	-4.40479702e+00	7.31121642e+00	1.
	36531896e+00			
1029	-4.57662383e-01	-1.70465486e+00	-2.08401192e+00]	
1030	norm absolute difference alpha:	0.004282199568835882		
1031	norm absolute difference beta:	0.1333861911796702		
1032	LogLikelihood value:	11603.199066518002		
1033	Difference LogLikelihood value:	-0.08048702930318541		
1034	E-step duration:	0:00:05		

```
1035 function value: 11633.111096509656 at iteration 1000
1036 Optimization terminated successfully.
1037         Current function value: 11633.107166
1038         Iterations: 1429
1039         Function evaluations: 1945
1040
1041 10 largest Differences in logl according to simplex
before termination:
1042 [0.00060067 0.0006025 0.00060365 0.00060496 0.00060559
0.00060611
1043 0.00060699 0.00060808 0.00060817 0.00060869]
1044
1045 10 largest Differences in logl according to simplex at
termination:
1046 [0.00083721 0.00083904 0.00084019 0.0008415 0.00084213
0.00084265
1047 0.00084353 0.00084462 0.00084471 0.00084523]
1048
1049 10 largest Differences in x according to simplex before
termination:
1050 [0.05721491 0.05856028 0.0593565 0.06400992 0.07261172
0.0746311
1051 0.0868845 0.09037784 0.09124065 0.09582699]
1052
1053 10 largest Differences in x according to simplex at
termination:
1054 [0.05615038 0.05741234 0.06376443 0.06383201 0.07270287
0.07433759
1055 0.07645731 0.08341167 0.08830051 0.08862018]
1056 Finished iteration 11, duration M step 0:02:07
1057 [ 3.49684000e-03 -1.00589800e-01 -8.51090250e-01 1.
05632507e-04
1058 1.27501890e-02 1.78456830e-02 -5.77416872e-13 -4.
16701129e+00
1059 1.26284793e+00 -3.16851134e-03 4.46882072e-03 -7.
86965540e-05
1060 -5.03061470e-06 -2.33859533e+00 1.80741193e-05 1.
16709967e-03
1061 -7.86667427e-05 1.00042790e-02 4.62365211e-08 2.
67244933e+00
1062 1.38539584e-03 -8.57641699e-06 -4.30237210e-02 2.
77542326e+01
1063 2.20308666e-03 2.36439392e+01 -1.58543413e-09 6.
83234370e+00
1064 -1.24476975e+00 3.37693736e-01 2.92977039e-03 3.
45579656e+00
```

1065	2.33990506e-14	1.50155483e+00	-3.18742373e+00	1.
	29730290e-01			
1066	-2.60920047e+00	-3.40087695e-04	-4.47251366e-01	1.
	93218109e-02			
1067	-4.12021619e-08	1.84454070e+00	2.52354257e-05	2.
	21528482e-06			
1068	-3.26532870e-03	3.65239394e-05	4.29409583e+00	1.
	53637546e-06			
1069	3.26332479e-05	1.65472548e+01	-6.65922219e-08	6.
	84620414e-12			
1070	9.99504647e+00	-9.67734381e-01	1.55587599e+01	-1.
	33721040e+00			
1071	2.46684506e-01	-5.82662183e-07	1.03683847e+00	9.
	67293345e-05			
1072	-2.05079333e-02	-1.20329068e+00	1.72451796e+00	-1.
	87178868e-01			
1073	-6.16440122e-03	6.71201786e-02	-6.17522207e-03	-7.
	87362726e-06			
1074	1.40066859e+00	-4.83397863e-05	-2.28192000e-05	1.
	35982935e-05			
1075	-1.96693197e-03	3.51794155e+00	-6.43942112e-04	-5.
	34427346e-03			
1076	-9.35145432e-10	5.61136945e-11	-1.24666233e+01	3.
	95804034e-10			
1077	-1.56851897e+01	8.27001098e-04	3.32004581e-05	-1.
	64893274e+00			
1078	1.11143384e-02	4.29184175e-03	-7.15818638e-03	1.
	68855941e-04			
1079	3.79723935e-02	2.48530602e+00	3.99339758e+00	9.
	71080197e+00			
1080	-3.50898791e-03	-2.57124808e-02	1.57810201e+00	3.
	29090133e-03			
1081	-7.22324793e-08	7.68021434e-08	3.99122460e-04	1.
	39666837e-03			
1082	5.66267795e-04	-4.53607913e+00	-2.05901857e-02	1.
	16401683e+00			
1083	3.18813855e-04	-9.93740162e-01	-1.02676021e-05	4.
	19779051e-08			
1084	4.66912782e-05	1.45510611e-04	3.90831539e-01	-2.
	84997275e-02			
1085	4.18906786e-04	-1.24152159e-04	1.31607341e-02	3.
	01068331e-04			
1086	-7.79031142e-05	-2.66349300e-03	3.97228778e-04	1.
	36501615e+00			
1087	-1.24950039e-01	-9.16925077e-03	5.14464934e-12	3.
	06840707e-04			

```

1088  1.72628715e-04  3.70479735e-05  9.54293040e-09  1.
      08085872e-10
1089  2.39379904e-05  -9.63395474e-01  -9.18916271e-08  7.
      39723798e-05
1090  -2.18145520e-06  -6.00137267e-07  1.93835230e-09  -4.
      14496978e-06
1091  5.81571488e-02  -9.64435185e-03  8.43623695e-05  -8.
      98036398e-06
1092  1.81291575e+01  1.94729125e+01  -3.92527946e-01  1.
      63813043e+01
1093  1.57743194e+01  1.80391185e+00  1.68654021e-06  2.
      25695403e-04
1094  -1.50871869e-05  9.44497679e-08  7.33141563e-01  2.
      97703660e-02
1095  1.13583620e-04  -2.11475527e-04  -1.56470806e-03  -1.
      13861312e-02
1096  4.53491597e-03  -3.28411145e-06  -7.42171531e-03  -1.
      70863712e-04
1097  -4.55810608e-03  9.79676304e-05  4.38028900e-02  -1.
      08301532e-02
1098  3.44094238e-07  -4.60221582e-06  1.14677404e-04  -5.
      87530225e-13
1099  -1.35066476e+01  6.21354134e-11  -1.95173132e-01  9.
      59546625e+00
1100  8.43374649e+00  -7.38335404e+00  -9.96105421e-04  -4.
      43969891e-01
1101  6.93105357e-01  -6.35043435e+00  1.06591020e+01  1.
      27778320e+01
1102  -3.41419069e-04  1.13501041e-01  -5.54487574e-01  8.
      50168346e-01
1103  -5.52037853e-01  -1.06350702e+01  -7.15007881e+00  -1.
      88739507e+01
1104  1.33337237e+00  -2.47947569e-01  -9.85231375e+00  -9.
      45609913e+00
1105  -9.24311100e-01  -4.40448942e+00  7.31151099e+00  1.
      36554469e+00
1106  -4.57515287e-01  -1.70453970e+00  -2.08356225e+00]
1107 norm absolute difference alpha: 0.005385190967760941
1108 norm absolute difference beta: 0.10180076384316003
1109 LogLikelihood value: 11603.17107866077
1110 Difference LogLikelihood value: -0.027987857232801616
1111 E-step duration: 0:00:05
1112 function value: 11632.754221755848 at iteration 1000
1113 function value: 11632.748719050447 at iteration 2000
1114 Optimization terminated successfully.
1115 Current function value: 11632.748022

```

```
1116 Iterations: 1875
1117 Function evaluations: 2357
1118
1119 10 largest Differences in logl according to simplex
before termination:
1120 [0.00070604 0.00070899 0.00071014 0.00071328 0.00071504
0.00071638
1121 0.00072479 0.00072512 0.00072539 0.00072565]
1122
1123 10 largest Differences in logl according to simplex at
termination:
1124 [0.00074044 0.00074339 0.00074454 0.00074769 0.00074945
0.00075078
1125 0.0007592 0.00075952 0.00075979 0.00076006]
1126
1127 10 largest Differences in x according to simplex before
termination:
1128 [0.06344154 0.07219213 0.07412749 0.07671206 0.08079472
0.08094356
1129 0.08242207 0.08689161 0.09072411 0.09675557]
1130
1131 10 largest Differences in x according to simplex at
termination:
1132 [0.06664188 0.07208592 0.07545975 0.08059266 0.08157784
0.0823317
1133 0.08625228 0.08640378 0.09127485 0.0913154 ]
1134 Finished iteration 12, duration M step 0:02:21
1135 [ 3.49725157e-03 -1.00033298e-01 -8.50777651e-01 1.
05697218e-04
1136 1.27247405e-02 1.78284579e-02 -5.77153334e-13 -4.
16640751e+00
1137 1.25614851e+00 -3.16823998e-03 4.47730216e-03 -7.
87569747e-05
1138 -5.03745069e-06 -2.34001509e+00 1.79414719e-05 1.
16714322e-03
1139 -7.87220422e-05 9.99720368e-03 4.60531658e-08 2.
66707210e+00
1140 1.38750252e-03 -8.58532175e-06 -4.29412498e-02 2.
77723809e+01
1141 2.20297840e-03 2.36485239e+01 -1.58389543e-09 6.
83419298e+00
1142 -1.24486989e+00 3.37754648e-01 2.92874069e-03 3.
45377692e+00
1143 2.33752036e-14 1.50123031e+00 -3.18722021e+00 1.
29301064e-01
1144 -2.60797151e+00 -3.40297530e-04 -4.45731499e-01 1.
```

1144	92955280e-02				
1145	-4.09855597e-08	1.84380988e+00	2.52560554e-05	2.	
	22777454e-06				
1146	-3.27774726e-03	3.65429331e-05	4.29211617e+00	1.	
	53841437e-06				
1147	3.26545203e-05	1.65398991e+01	-6.61546898e-08	6.	
	98597064e-12				
1148	9.99290833e+00	-9.67774947e-01	1.55658082e+01	-1.	
	33666173e+00				
1149	2.46225745e-01	-5.77752395e-07	1.03097163e+00	9.	
	67861776e-05				
1150	-2.04731481e-02	-1.20530763e+00	1.72100689e+00	-1.	
	81505677e-01				
1151	-6.15887260e-03	6.70403614e-02	-6.17145141e-03	-7.	
	87535316e-06				
1152	1.39208122e+00	-4.83821621e-05	-2.28419615e-05	1.	
	35947801e-05				
1153	-1.96679592e-03	3.51428241e+00	-6.44081218e-04	-5.	
	35678910e-03				
1154	-9.32868084e-10	5.60304442e-11	-1.24687237e+01	3.	
	94556023e-10				
1155	-1.56890998e+01	8.28576525e-04	3.32206930e-05	-1.	
	65042164e+00				
1156	1.11067375e-02	4.28549261e-03	-7.14671499e-03	1.	
	68771621e-04				
1157	3.78996128e-02	2.48630937e+00	3.99774261e+00	9.	
	71965655e+00				
1158	-3.50739940e-03	-2.52967833e-02	1.58783207e+00	3.	
	29883725e-03				
1159	-7.22370428e-08	7.60786784e-08	3.99779366e-04	1.	
	39903166e-03				
1160	5.66288776e-04	-4.66235484e+00	-2.04941237e-02	1.	
	15774643e+00				
1161	3.18981884e-04	-1.00174647e+00	-1.02771634e-05	4.	
	17392866e-08				
1162	4.67280761e-05	1.45598637e-04	3.96183984e-01	-2.	
	84891415e-02				
1163	4.19001333e-04	-1.24193847e-04	1.31468499e-02	3.	
	01240574e-04				
1164	-7.79148744e-05	-2.66337406e-03	3.97415809e-04	1.	
	35559679e+00				
1165	-1.25414364e-01	-9.17164469e-03	5.14085468e-12	3.	
	06893138e-04				
1166	1.72713201e-04	3.70691274e-05	9.51581208e-09	1.	
	07861434e-10				
1167	2.39547480e-05	-9.52047393e-01	-9.12759198e-08	7.	

```
1167 40953831e-05
1168 -2.17357154e-06 -5.94739844e-07 1.93151758e-09 -4.
15205203e-06
1169 5.78100057e-02 -9.63167243e-03 8.43951368e-05 -8.
98900889e-06
1170 1.81641096e+01 1.95092077e+01 -4.08625035e-01 1.
64129007e+01
1171 1.58345709e+01 1.80328707e+00 1.68793279e-06 2.
25830548e-04
1172 -1.50988575e-05 9.38897453e-08 7.29410641e-01 3.
02780681e-02
1173 1.13702539e-04 -2.11637624e-04 -1.56528937e-03 -1.
13673137e-02
1174 4.53041256e-03 -3.59934362e-06 -7.41180165e-03 -1.
70963852e-04
1175 -4.58205844e-03 9.80686817e-05 4.36671210e-02 -1.
08179574e-02
1176 3.42552471e-07 -4.55950400e-06 1.14751058e-04 -5.
86904293e-13
1177 -1.35265795e+01 6.21154591e-11 -1.95738483e-01 9.
59472120e+00
1178 8.43524064e+00 -7.37987980e+00 -9.95135186e-04 -4.
44670958e-01
1179 6.92582678e-01 -6.34812657e+00 1.06588528e+01 1.
27775529e+01
1180 -3.41479651e-04 1.13290757e-01 -5.54521206e-01 8.
50403417e-01
1181 -5.52311458e-01 -1.06390040e+01 -7.14515133e+00 -1.
88717906e+01
1182 1.33311374e+00 -2.48128529e-01 -9.85044551e+00 -9.
46528620e+00
1183 -9.24115564e-01 -4.40430531e+00 7.31150988e+00 1.
36575483e+00
1184 -4.57379509e-01 -1.70471933e+00 -2.08317324e+00]
1185 norm absolute difference alpha: 0.005547533049751652
1186 norm absolute difference beta: 0.17420489489915314
1187 LogLikelihood value: 11603.13919091006
1188 Difference LogLikelihood value: -0.03188775070884731
1189 E-step duration: 0:00:06
1190 function value: 11632.44825576475 at iteration 1000
1191 function value: 11632.443198382658 at iteration 2000
1192 function value: 11632.44023391437 at iteration 3000
1193 Optimization terminated successfully.
1194 Current function value: 11632.438906
1195 Iterations: 2601
1196 Function evaluations: 3076
```

```
1197
1198 10 largest Differences in logl according to simplex
      before termination:
1199 [0.00093029 0.00093616 0.00093867 0.00094126 0.00094977
      0.00094988
1200 0.0009513 0.00095893 0.00096106 0.00096621]
1201
1202 10 largest Differences in logl according to simplex at
      termination:
1203 [0.00139877 0.00140463 0.00140714 0.00140974 0.00141824
      0.00141836
1204 0.00141977 0.0014274 0.00142953 0.00143468]
1205
1206 10 largest Differences in x according to simplex before
      termination:
1207 [0.07772047 0.0799169 0.08210372 0.08417015 0.08500321
      0.0908869
1208 0.09164486 0.09668543 0.09829976 0.10302445]
1209
1210 10 largest Differences in x according to simplex at
      termination:
1211 [0.07892624 0.08030075 0.08097499 0.08407671 0.08612323
      0.08826809
1212 0.09223873 0.09715319 0.09716491 0.09982602]
1213 Finished iteration 13, duration M step 0:03:01
1214 [ 3.47150381e-03 -9.94234132e-02 -8.50516869e-01 1.
      05630496e-04
1215 1.27138421e-02 1.78487258e-02 -5.77975009e-13 -4.
      17456958e+00
1216 1.24166104e+00 -3.14804022e-03 4.48257897e-03 -7.
      87325639e-05
1217 -5.04682974e-06 -2.34548233e+00 1.79901798e-05 1.
      15214577e-03
1218 -7.87182390e-05 1.00065550e-02 4.60953395e-08 2.
      66375565e+00
1219 1.38855520e-03 -8.58838113e-06 -4.29161139e-02 2.
      77849399e+01
1220 2.18381081e-03 2.36551440e+01 -1.58550004e-09 6.
      83396220e+00
1221 -1.24506951e+00 3.37631898e-01 2.93229397e-03 3.
      45411286e+00
1222 2.34039734e-14 1.50055606e+00 -3.18844904e+00 1.
      28711743e-01
1223 -2.60594816e+00 -3.40058598e-04 -4.42732744e-01 1.
      93117757e-02
1224 -4.10805861e-08 1.84249687e+00 2.53052519e-05 2.
```

1224	23509098e-06				
1225	-3.29403810e-03	3.65478914e-05	4.28900076e+00	1.	
	54066445e-06				
1226	3.26368740e-05	1.65462310e+01	-6.63126359e-08	6.	
	99455389e-12				
1227	9.98927196e+00	-9.68209665e-01	1.55738888e+01	-1.	
	33581077e+00				
1228	2.45335512e-01	-5.79244487e-07	1.02531437e+00	9.	
	66940106e-05				
1229	-1.97743618e-02	-1.20403376e+00	1.71915356e+00	-1.	
	78973589e-01				
1230	-6.16746620e-03	6.71064781e-02	-6.17755080e-03	-7.	
	88424613e-06				
1231	1.39173045e+00	-4.84447194e-05	-2.28149383e-05	1.	
	36157957e-05				
1232	-2.14905106e-03	3.50836379e+00	-6.38100160e-04	-5.	
	37165762e-03				
1233	-9.34570851e-10	5.61009743e-11	-1.24681975e+01	3.	
	95244446e-10				
1234	-1.56936361e+01	8.00824358e-04	3.32123264e-05	-1.	
	66000678e+00				
1235	1.11201209e-02	4.28759324e-03	-7.14738590e-03	1.	
	69024992e-04				
1236	3.78750463e-02	2.49175897e+00	4.01827754e+00	9.	
	73201517e+00				
1237	-3.48797548e-03	-2.46911682e-02	1.59331323e+00	3.	
	30535458e-03				
1238	-7.22797393e-08	7.61757385e-08	3.99868943e-04	1.	
	39922479e-03				
1239	5.61735297e-04	-4.86539097e+00	-2.02251945e-02	1.	
	13236807e+00				
1240	3.23971184e-04	-1.00928633e+00	-1.02596187e-05	4.	
	18429602e-08				
1241	4.67638232e-05	1.45489897e-04	4.07841252e-01	-2.	
	85175395e-02				
1242	4.13568846e-04	-1.23876852e-04	1.31690447e-02	3.	
	00818765e-04				
1243	-7.75720729e-05	-2.63304457e-03	3.97382364e-04	1.	
	34744418e+00				
1244	-1.24600712e-01	-9.05550537e-03	5.14720671e-12	3.	
	05582344e-04				
1245	1.70181171e-04	3.70642861e-05	9.52956421e-09	1.	
	07988445e-10				
1246	2.39547822e-05	-9.28721611e-01	-9.15072803e-08	7.	
	41777847e-05				
1247	-2.17542356e-06	-5.96510097e-07	1.93401932e-09	-4.	

```

1247 05057231e-06
1248   5.69941537e-02 -9.64412188e-03  8.45295808e-05 -8.
     88369040e-06
1249   1.82118618e+01  1.95742359e+01 -4.46831107e-01  1.
     64726207e+01
1250   1.58896117e+01  1.80454658e+00  1.68539871e-06  2.
     25546533e-04
1251   -1.50966408e-05  9.40992818e-08  7.23290173e-01  3.
     12099872e-02
1252   1.13846447e-04 -2.11693666e-04 -1.56111591e-03 -1.
     13749081e-02
1253   4.53356805e-03 -3.60607911e-06 -7.42088257e-03 -1.
     76022264e-04
1254   -4.58621117e-03  9.82387001e-05  4.35419927e-02 -1.
     08353448e-02
1255   3.42740346e-07 -4.57389702e-06  1.14636775e-04 -5.
     87489000e-13
1256   -1.35444291e+01  6.21857093e-11 -1.96303690e-01  9.
     59749281e+00
1257   8.43306186e+00 -7.37458719e+00 -9.95864942e-04 -4.
     45553265e-01
1258   6.91923136e-01 -6.34752141e+00  1.06585683e+01  1.
     27772079e+01
1259   -3.37910607e-04  1.12833234e-01 -5.54718205e-01  8.
     50705691e-01
1260   -5.52793596e-01 -1.06360436e+01 -7.15043542e+00 -1.
     88777212e+01
1261   1.33278264e+00 -2.48310797e-01 -9.85223487e+00 -9.
     47058995e+00
1262   -9.24228483e-01 -4.40406127e+00  7.31125000e+00  1.
     36601513e+00
1263   -4.57193137e-01 -1.70465443e+00 -2.08264345e+00]
1264 norm absolute difference alpha: 0.0037079417432675675
1265 norm absolute difference beta: 0.144636707477184
1266 LogLikelihood value: 11603.09764051813
1267 Difference LogLikelihood value: -0.04155039193028642
1268 E-step duration: 0:00:05
1269 function value: 11632.191943659722 at iteration 1000
1270 Optimization terminated successfully.
1271           Current function value: 11632.189464
1272           Iterations: 775
1273           Function evaluations: 1244
1274
1275 10 largest Differences in logl according to simplex
before termination:
1276 [0.00096966 0.00097202 0.000975    0.00097694 0.00098192

```

```

1276 0.00098707
1277 0.00099175 0.00099226 0.00099758 0.00101081]
1278
1279 10 largest Differences in logl according to simplex at
termination:
1280 [0.00232183 0.0023242 0.00232717 0.00232911 0.0023341
0.00233925
1281 0.00234393 0.00234444 0.00234976 0.00236299]
1282
1283 10 largest Differences in x according to simplex before
termination:
1284 [0.0767716 0.07766331 0.08318671 0.08536711 0.08783826
0.09091998
1285 0.09754064 0.10014309 0.11335198 0.11505646]
1286
1287 10 largest Differences in x according to simplex at
termination:
1288 [0.07244294 0.07510783 0.07768136 0.07837476 0.08271261
0.08768336
1289 0.08837119 0.09069522 0.09557364 0.09654128]
1290 Finished iteration 14, duration M step 0:01:20
1291 [ 3.47150381e-03 -9.94234132e-02 -8.50516869e-01 1.
05630496e-04
1292 1.27138421e-02 1.78487258e-02 -5.77975009e-13 -4.
17456958e+00
1293 1.24166104e+00 -3.14804022e-03 4.48257897e-03 -7.
87325639e-05
1294 -5.04682974e-06 -2.34548233e+00 1.79901798e-05 1.
15214577e-03
1295 -7.87182390e-05 1.00065550e-02 4.60953395e-08 2.
66375565e+00
1296 1.38855520e-03 -8.58838113e-06 -4.29161139e-02 2.
77849399e+01
1297 2.18381081e-03 2.36551440e+01 -1.58550004e-09 6.
83396220e+00
1298 -1.24506951e+00 3.37631898e-01 2.93229397e-03 3.
45411286e+00
1299 2.34039734e-14 1.50055606e+00 -3.18844904e+00 1.
28711743e-01
1300 -2.60594816e+00 -3.40058598e-04 -4.42732744e-01 1.
93117757e-02
1301 -4.10805861e-08 1.84249687e+00 2.53052519e-05 2.
23509098e-06
1302 -3.29403810e-03 3.65478914e-05 4.28900076e+00 1.
54066445e-06
1303 3.26368740e-05 1.65462310e+01 -6.63126359e-08 6.

```

1303	99455389e-12				
1304	9.98927196e+00	-9.68209665e-01	1.55738888e+01	-1.	
	33581077e+00				
1305	2.45335512e-01	-5.79244487e-07	1.02531437e+00	9.	
	66940106e-05				
1306	-1.97743618e-02	-1.20403376e+00	1.71915356e+00	-1.	
	78973589e-01				
1307	-6.16746620e-03	6.71064781e-02	-6.17755080e-03	-7.	
	88424613e-06				
1308	1.39173045e+00	-4.84447194e-05	-2.28149383e-05	1.	
	36157957e-05				
1309	-2.14905106e-03	3.50836379e+00	-6.38100160e-04	-5.	
	37165762e-03				
1310	-9.34570851e-10	5.61009743e-11	-1.24681975e+01	3.	
	95244446e-10				
1311	-1.56936361e+01	8.00824358e-04	3.32123264e-05	-1.	
	66000678e+00				
1312	1.11201209e-02	4.28759324e-03	-7.14738590e-03	1.	
	69024992e-04				
1313	3.78750463e-02	2.49175897e+00	4.01827754e+00	9.	
	73201517e+00				
1314	-3.48797548e-03	-2.46911682e-02	1.59331323e+00	3.	
	30535458e-03				
1315	-7.22797393e-08	7.61757385e-08	3.99868943e-04	1.	
	39922479e-03				
1316	5.61735297e-04	-4.86539097e+00	-2.02251945e-02	1.	
	13236807e+00				
1317	3.23971184e-04	-1.00928633e+00	-1.02596187e-05	4.	
	18429602e-08				
1318	4.67638232e-05	1.45489897e-04	4.07841252e-01	-2.	
	85175395e-02				
1319	4.13568846e-04	-1.23876852e-04	1.31690447e-02	3.	
	00818765e-04				
1320	-7.75720729e-05	-2.63304457e-03	3.97382364e-04	1.	
	34744418e+00				
1321	-1.24600712e-01	-9.05550537e-03	5.14720671e-12	3.	
	05582344e-04				
1322	1.70181171e-04	3.70642861e-05	9.52956421e-09	1.	
	07988445e-10				
1323	2.39547822e-05	-9.28721611e-01	-9.15072803e-08	7.	
	41777847e-05				
1324	-2.17542356e-06	-5.96510097e-07	1.93401932e-09	-4.	
	05057231e-06				
1325	5.69941537e-02	-9.64412188e-03	8.45295808e-05	-8.	
	88369040e-06				
1326	1.82118618e+01	1.95742359e+01	-4.69172662e-01	1.	

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1326 64726207e+01
1327 1.58896117e+01 1.80454658e+00 1.68539871e-06 2.
    25546533e-04
1328 -1.50966408e-05 9.40992818e-08 7.23290173e-01 3.
    12099872e-02
1329 1.13846447e-04 -2.11693666e-04 -1.56111591e-03 -1.
    13749081e-02
1330 4.53356805e-03 -3.60607911e-06 -7.42088257e-03 -1.
    76022264e-04
1331 -4.58621117e-03 9.82387001e-05 4.35419927e-02 -1.
    08353448e-02
1332 3.42740346e-07 -4.57389702e-06 1.14636775e-04 -5.
    87489000e-13
1333 -1.35444291e+01 6.21857093e-11 -1.96303690e-01 9.
    59749281e+00
1334 8.43306186e+00 -7.37458719e+00 -9.95864942e-04 -4.
    45553265e-01
1335 6.91923136e-01 -6.34752141e+00 1.06585683e+01 1.
    27772079e+01
1336 -3.37910607e-04 1.12833234e-01 -5.54718205e-01 8.
    50705691e-01
1337 -5.52793596e-01 -1.06360436e+01 -7.15043542e+00 -1.
    88777212e+01
1338 1.33278264e+00 -2.48310797e-01 -9.85223487e+00 -9.
    47058995e+00
1339 -9.24228483e-01 -4.40406127e+00 7.31125000e+00 1.
    36601513e+00
1340 -4.57193137e-01 -1.70465443e+00 -2.08264345e+00]
1341 norm absolute difference alpha: 0.00331319328162665
1342 norm absolute difference beta: 0.08572367224906914
1343 LogLikelihood value: 11603.092472662021
1344 Difference LogLikelihood value: -0.005167856108528213
1345 E-step duration: 0:00:05
1346 function value: 11632.128228688187 at iteration 1000
1347 Optimization terminated successfully.
1348     Current function value: 11632.125709
1349     Iterations: 849
1350     Function evaluations: 1320
1351
1352 10 largest Differences in logl according to simplex
before termination:
1353 [0.00097401 0.00097903 0.00098855 0.00099438 0.00099812
    0.00100853
1354 0.00100915 0.00101558 0.00102039 0.00102322]
1355
1356 10 largest Differences in logl according to simplex at

```

```

1356 termination:
1357 [ 0.00202451 0.00202953 0.00203905 0.00204488 0.00204862
      0.00205903
1358 0.00205964 0.00206608 0.00207088 0.00207372]
1359
1360 10 largest Differences in x according to simplex before
      termination:
1361 [ 0.06343966 0.07749385 0.0789361 0.0835353 0.083935
      0.08686705
1362 0.08949122 0.09829291 0.10233238 0.11078925]
1363
1364 10 largest Differences in x according to simplex at
      termination:
1365 [ 0.07176406 0.07869806 0.07896043 0.07908663 0.08058632
      0.08334599
1366 0.0874211 0.08793136 0.08839415 0.0902785 ]
1367 Finished iteration 15, duration M step 0:01:28
1368 [ 3.47150381e-03 -9.94234132e-02 -8.50516869e-01 1.
      05630496e-04
1369 1.27138421e-02 1.78487258e-02 -5.77975009e-13 -4.
      17456958e+00
1370 1.24166104e+00 -3.14804022e-03 4.48257897e-03 -7.
      87325639e-05
1371 -5.04682974e-06 -2.34548233e+00 1.79901798e-05 1.
      15214577e-03
1372 -7.87182390e-05 1.00065550e-02 4.60953395e-08 2.
      66375565e+00
1373 1.38855520e-03 -8.58838113e-06 -4.29161139e-02 2.
      77849399e+01
1374 2.18381081e-03 2.36551440e+01 -1.58550004e-09 6.
      83396220e+00
1375 -1.24506951e+00 3.37631898e-01 2.93229397e-03 3.
      45411286e+00
1376 2.34039734e-14 1.50055606e+00 -3.18844904e+00 1.
      28711743e-01
1377 -2.60594816e+00 -3.40058598e-04 -4.42732744e-01 1.
      93117757e-02
1378 -4.10805861e-08 1.84249687e+00 2.53052519e-05 2.
      23509098e-06
1379 -3.29403810e-03 3.65478914e-05 4.28900076e+00 1.
      54066445e-06
1380 3.26368740e-05 1.65462310e+01 -6.63126359e-08 6.
      99455389e-12
1381 9.98927196e+00 -9.68209665e-01 1.55738888e+01 -1.
      33581077e+00
1382 2.45335512e-01 -5.79244487e-07 1.02531437e+00 9.

```

1382	66940106e-05				
1383	-1.97743618e-02	-1.20403376e+00	1.71915356e+00	-1.	
	78973589e-01				
1384	-6.16746620e-03	6.71064781e-02	-6.17755080e-03	-7.	
	88424613e-06				
1385	1.39173045e+00	-4.84447194e-05	-2.28149383e-05	1.	
	36157957e-05				
1386	-2.14905106e-03	3.50836379e+00	-6.38100160e-04	-5.	
	37165762e-03				
1387	-9.34570851e-10	5.61009743e-11	-1.24681975e+01	3.	
	95244446e-10				
1388	-1.56936361e+01	8.00824358e-04	3.32123264e-05	-1.	
	66000678e+00				
1389	1.11201209e-02	4.28759324e-03	-7.14738590e-03	1.	
	69024992e-04				
1390	3.78750463e-02	2.49175897e+00	4.01827754e+00	9.	
	73201517e+00				
1391	-3.48797548e-03	-2.46911682e-02	1.59331323e+00	3.	
	30535458e-03				
1392	-7.22797393e-08	7.61757385e-08	3.99868943e-04	1.	
	39922479e-03				
1393	5.61735297e-04	-4.86539097e+00	-2.02251945e-02	1.	
	13236807e+00				
1394	3.23971184e-04	-1.00928633e+00	-1.02596187e-05	4.	
	18429602e-08				
1395	4.67638232e-05	1.45489897e-04	4.07841252e-01	-2.	
	85175395e-02				
1396	4.13568846e-04	-1.23876852e-04	1.31690447e-02	3.	
	00818765e-04				
1397	-7.75720729e-05	-2.63304457e-03	3.97382364e-04	1.	
	34744418e+00				
1398	-1.24600712e-01	-9.05550537e-03	5.14720671e-12	3.	
	05582344e-04				
1399	1.70181171e-04	3.70642861e-05	9.52956421e-09	1.	
	07988445e-10				
1400	2.39547822e-05	-9.28721611e-01	-9.15072803e-08	7.	
	41777847e-05				
1401	-2.17542356e-06	-5.96510097e-07	1.93401932e-09	-4.	
	05057231e-06				
1402	5.69941537e-02	-9.64412188e-03	8.45295808e-05	-8.	
	88369040e-06				
1403	1.82118618e+01	1.95742359e+01	-4.92631295e-01	1.	
	64726207e+01				
1404	1.58896117e+01	1.80454658e+00	1.68539871e-06	2.	
	25546533e-04				
1405	-1.50966408e-05	9.40992818e-08	7.23290173e-01	3.	

```

1405 12099872e-02
1406 1.13846447e-04 -2.11693666e-04 -1.56111591e-03 -1.
    13749081e-02
1407 4.53356805e-03 -3.60607911e-06 -7.42088257e-03 -1.
    76022264e-04
1408 -4.58621117e-03 9.82387001e-05 4.35419927e-02 -1.
    08353448e-02
1409 3.42740346e-07 -4.57389702e-06 1.14636775e-04 -5.
    87489000e-13
1410 -1.35444291e+01 6.21857093e-11 -1.96303690e-01 9.
    59749281e+00
1411 8.43306186e+00 -7.37458719e+00 -9.95864942e-04 -4.
    45553265e-01
1412 6.91923136e-01 -6.34752141e+00 1.06585683e+01 1.
    27772079e+01
1413 -3.37910607e-04 1.12833234e-01 -5.54718205e-01 8.
    50705691e-01
1414 -5.52793596e-01 -1.06360436e+01 -7.15043542e+00 -1.
    88777212e+01
1415 1.33278264e+00 -2.48310797e-01 -9.85223487e+00 -9.
    47058995e+00
1416 -9.24228483e-01 -4.40406127e+00 7.31125000e+00 1.
    36601513e+00
1417 -4.57193137e-01 -1.70465443e+00 -2.08264345e+00]
1418 norm absolute difference alpha: 0.0006578910180470533
1419 norm absolute difference beta: 0.0012398196339384751
1420 LogLikelihood value: 11603.087296754651
1421 Difference LogLikelihood value: -0.005175907370357891
1422 Total EM duration: 2:37:33
1423 Doing another BFGS step for the covariance at 04:38:38
1424 Warning: Desired error not necessarily achieved due to
precision loss.
1425 Current function value: 10434.901105
1426 Iterations: 343
1427 Function evaluations: 102213
1428 Gradient evaluations: 511
1429 Done calculating at 06:15:04!
1430 HMM finished! Total time: 4:14:00
1431 ***Checking HMM output***
1432 Interpreting the following parameters
1433 Gamma_0: [[ 4.13240621e+01 -7.06630269e-01 -7.82945736e+
    00 3.90334450e-01
1434 1.94724347e+01 -3.00226247e+00 2.42849036e+01 -4.
    23351180e+01
1435 4.09697819e+01 -1.24774033e-01 -2.35318556e-01 -2.
    45328364e+00

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1436	2.88612205e+00	-1.07748892e+01	2.41565427e+01	-7.
	23041971e-02			
1437	-2.49414780e-02	-1.38738039e+01	1.43232841e+01	4.
	17102412e+01			
1438	2.23150161e+01	-2.66704747e+01	-4.29161139e-02	9.
	75604429e+01			
1439	8.73497000e-02	8.07401625e+01	-6.86892253e+01]	
1440	[2.67247857e+01	-8.32717175e+00	-1.23288292e+00	-1.
	65124823e+01			
1441	4.59669366e+01	-1.75291639e+01	1.42906444e+01	-2.
	27619957e+01			
1442	4.63556855e+01	8.81323789e+00	-1.97430805e+00	-3.
	92825876e+01			
1443	-2.11674676e-02	-1.27124411e+01	3.48617446e+01	8.
	25623467e+00			
1444	-1.02399038e+00	-4.45658305e+01	-7.34699243e+00	6.
	94123202e+01			
1445	2.25989367e+01	-8.61401927e+00	1.32441882e+02	-8.
	68031002e-02			
1446	7.81126529e+01	4.38400499e+01	1.12563639e+01]	
1447	[8.35178554e+01	-2.08425302e+00	-5.54430747e+00	4.
	66826678e+00			
1448	3.13937135e+01	1.20194033e+01	1.66285560e+01	-1.
	61448028e+00			
1449	3.95643494e+01	1.72665904e+00	6.81708346e+00	-5.
	96976508e+00			
1450	4.22092930e+00	-1.53926968e+01	2.56696952e+01	-5.
	86806024e-01			
1451	1.08737443e+00	-1.17685947e+01	9.72671432e+00	5.
	15862017e+01			
1452	1.91957672e+01	-7.67157342e+00	-6.34327204e+01	-5.
	47195276e+01			
1453	-3.11088371e+01	-5.18367004e+01	-1.10432862e+02]]	
1454	Gamma_sr_0: [[-8.25353930e-01	-3.52702153e+00	-3.	
	79221902e+00	-5.91504177e-03]		
1455	[-6.67420445e+00	-2.68360804e+00	-5.88040874e+00	2.
	10936292e-02]			
1456	[1.41177403e+01	1.72937860e+01	2.63786818e+01	-6.
	16613359e-02]			
1457	Gamma_sk_t: [[14.87086881	13.56818773	-2.82924193	-8.
	6509262	-7.34743951		
1458	-1.36322147	-1.28426322	1.93322046	2.69461793
	.80883586			2
1459	1.78679447	1.01687595	7.48153307	0.17375492
	.65905157			-1
1460	-5.22592364	-0.51359275	0.85443505	1.71307092
				-0

```

1460 .18239309
1461     0.77895664  31.19048524  37.0947461  26.17329827  28
     .64710912
1462     -9.09743567]
1463 [ 15.54567097  13.69510457  4.83869197  0.25110446  0
     .2633582
1464     6.28614333  -1.76919847  1.02395301  2.02599177  1
     .32516634
1465     1.09310106  1.54565848  6.8089328   0.17014112  -2
     .14148456
1466     -5.69727473  -0.71495729  0.41526924  2.06120202  0
     .19554632
1467     1.354073    20.81020829  24.85544513  15.56880936  17
     .58856367
1468     50.05373816]
1469 [ 12.57736751  15.7630857   0.90631931  10.14372678  7
     .99136336
1470     9.39926989  5.4347482   2.6446624   -1.28979388  -1
     .13760433
1471     5.01252286  -2.50783218  -7.0228092   4.46430017  4
     .6202172
1472     11.3527639   1.29212806  1.81688406  -0.76524104  5
     .91777584
1473     0.36820661  -34.02602223  -42.67206492  -42.60222865  -29
     .97307862
1474     -25.53784754]]
1475 Beta: [[[ 3.02158369e+01  2.40162353e+01  -2.13458096e+01
1476     [ 3.27993473e-01  0.00000000e+00  0.00000000e+00]
1477     [-9.22540752e-01  0.00000000e+00  0.00000000e+00]
1478     [ 1.01973369e+00  -3.15397143e+01  0.00000000e+00]]]
1479
1480 [[ 2.93616551e+01  3.13669931e+01  1.75574507e+01]
1481     [ 4.90390822e-01  0.00000000e+00  0.00000000e+00]
1482     [-1.24016591e+00  0.00000000e+00  0.00000000e+00]
1483     [ 5.49909409e-01  4.14488558e-01  0.00000000e+00]]]
1484
1485 [[ -3.77815652e+01  -3.47361561e+01  -4.07813464e+01]
1486     [ 1.59994191e+00  0.00000000e+00  0.00000000e+00]
1487     [-7.05910986e-01  0.00000000e+00  0.00000000e+00]
1488     [ -3.02352910e+01  -3.41178022e+01  0.00000000e+00]]]
1489
1490 [[ 9.71727751e-01  6.32426570e-01  1.33835330e+01]
1491     [ 1.09884148e+00  0.00000000e+00  0.00000000e+00]
1492     [ 2.25290896e-04  0.00000000e+00  0.00000000e+00]
1493     [ -1.79244678e+00  -1.79363345e+00  0.00000000e+00]]]
1494 [ 4.13240621e+01  -7.06630269e-01  -7.82945736e+00  3.

```

1494	90334450e-01				
1495	1.94724347e+01	-3.00226247e+00	2.42849036e+01	-4.	
	23351180e+01				
1496	4.09697819e+01	-1.24774033e-01	-2.35318556e-01	-2.	
	45328364e+00				
1497	2.88612205e+00	-1.07748892e+01	2.41565427e+01	-7.	
	23041971e-02				
1498	-2.49414780e-02	-1.38738039e+01	1.43232841e+01	4.	
	17102412e+01				
1499	2.23150161e+01	-2.66704747e+01	-4.29161139e-02	9.	
	75604429e+01				
1500	8.73497000e-02	8.07401625e+01	-6.86892253e+01	2.	
	67247857e+01				
1501	-8.32717175e+00	-1.23288292e+00	-1.65124823e+01	4.	
	59669366e+01				
1502	-1.75291639e+01	1.42906444e+01	-2.27619957e+01	4.	
	63556855e+01				
1503	8.81323789e+00	-1.97430805e+00	-3.92825876e+01	-2.	
	11674676e-02				
1504	-1.27124411e+01	3.48617446e+01	8.25623467e+00	-1.	
	02399038e+00				
1505	-4.45658305e+01	-7.34699243e+00	6.94123202e+01	2.	
	25989367e+01				
1506	-8.61401927e+00	1.32441882e+02	-8.68031002e-02	7.	
	81126529e+01				
1507	4.38400499e+01	1.12563639e+01	8.35178554e+01	-2.	
	08425302e+00				
1508	-5.54430747e+00	4.66826678e+00	3.13937135e+01	1.	
	20194033e+01				
1509	1.66285560e+01	-1.61448028e+00	3.95643494e+01	1.	
	72665904e+00				
1510	6.81708346e+00	-5.96976508e+00	4.22092930e+00	-1.	
	53926968e+01				
1511	2.56696952e+01	-5.86806024e-01	1.08737443e+00	-1.	
	17685947e+01				
1512	9.72671432e+00	5.15862017e+01	1.91957672e+01	-7.	
	67157342e+00				
1513	-6.34327204e+01	-5.47195276e+01	-3.11088371e+01	-5.	
	18367004e+01				
1514	-1.10432862e+02	-8.25353930e-01	-3.52702153e+00	-3.	
	79221902e+00				
1515	-5.91504177e-03	-6.67420445e+00	-2.68360804e+00	-5.	
	88040874e+00				
1516	2.10936292e-02	1.41177403e+01	1.72937860e+01	2.	
	63786818e+01				
1517	-6.16613359e-02	1.48708688e+01	1.35681877e+01	-2.	

1517	82924193e+00					
1518	-8.65092620e+00	-7.34743951e+00	-1.36322147e+00	-1.		
	28426322e+00					
1519	1.93322046e+00	2.69461793e+00	2.80883586e+00	1.		
	78679447e+00					
1520	1.01687595e+00	7.48153307e+00	1.73754918e-01	-1.		
	65905157e+00					
1521	-5.22592364e+00	-5.13592746e-01	8.54435049e-01	1.		
	71307092e+00					
1522	-1.82393087e-01	7.78956641e-01	3.11904852e+01	3.		
	70947461e+01					
1523	2.61732983e+01	2.86471091e+01	-9.09743567e+00	1.		
	55456710e+01					
1524	1.36951046e+01	4.83869197e+00	2.51104461e-01	2.		
	63358205e-01					
1525	6.28614333e+00	-1.76919847e+00	1.02395301e+00	2.		
	02599177e+00					
1526	1.32516634e+00	1.09310106e+00	1.54565848e+00	6.		
	80893280e+00					
1527	1.70141121e-01	-2.14148456e+00	-5.69727473e+00	-7.		
	14957292e-01					
1528	4.15269242e-01	2.06120202e+00	1.95546323e-01	1.		
	35407300e+00					
1529	2.08102083e+01	2.48554451e+01	1.55688094e+01	1.		
	75885637e+01					
1530	5.00537382e+01	1.25773675e+01	1.57630857e+01	9.		
	06319306e-01					
1531	1.01437268e+01	7.99136336e+00	9.39926989e+00	5.		
	43474820e+00					
1532	2.64466240e+00	-1.28979388e+00	-1.13760433e+00	5.		
	01252286e+00					
1533	-2.50783218e+00	-7.02280920e+00	4.46430017e+00	4.		
	62021720e+00					
1534	1.13527639e+01	1.29212806e+00	1.81688406e+00	-7.		
	65241039e-01					
1535	5.91777584e+00	3.68206609e-01	-3.40260222e+01	-4.		
	26720649e+01					
1536	-4.26022286e+01	-2.99730786e+01	-2.55378475e+01	3.		
	02158369e+01					
1537	2.40162353e+01	-2.13458096e+01	3.27993473e-01	-9.		
	22540752e-01					
1538	1.01973369e+00	-3.15397143e+01	2.93616551e+01	3.		
	13669931e+01					
1539	1.75574507e+01	4.90390822e-01	-1.24016591e+00	5.		
	49909409e-01					
1540	4.14488558e-01	-3.77815652e+01	-3.47361561e+01	-4.		

```
1540 07813464e+01
1541 1.59994191e+00 -7.05910986e-01 -3.02352910e+01 -3.
     41178022e+01
1542 9.71727751e-01 6.32426570e-01 1.33835330e+01 1.
     09884148e+00
1543 2.25290896e-04 -1.79244678e+00 -1.79363345e+00]
1544
1545 Process finished with exit code 0
1546
```