**I. Pen-and-paper**

1. **E-Step:  
   1. Likelihoods**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 0.15915494309189535 | 9.43877951346626**e**-10 |
|  | 2.2390899578253236**e**-17 | 0.07957747154594767 |
|  | 0.00023927977920047084 | 9.82064017319871**e**-06 |
|  | 7.2256232377243294**e**-06 | 2.8136605178593184**e**-06 |

**2. Joint Probabilities**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 0.11140846016432673 | 2.831633854039878**e**-10 |
|  | 1.5673629704777265**e**-17 | 0.023873241463784303 |
|  | 0.00016749584544032957 | 2.946192051959613**e**-06 |
|  | 5.05793626640703**e**-06 | 8.440981553577955**e**-07 |

**3. Normalized Posteriors**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 0.9999999974583315 | 2.541668597399302e-09 |
|  | 6.565354658081997e-16 | 0.9999999999999992 |
|  | 0.9827144048774182 | 0.01728559512258177 |
|  | 0.8569818311724802 | 0.1430181688275199 |

**M-Step:  
1. Estimate new priors**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | 0.7099240583770576 | 0.29007594162294237 |

**2. Estimate new means**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |

**3. Estimate new covariance matrixes**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |

1. Answer 2
2. Answer 3
3. Answer 4

**II. Programming and critical analysis**

1. Answer 5
2. Answer 6
3. Answer 7
4. Answer 8

**III. APPENDIX**

Paste your programming code here using Consolas 9pt or 10pt.

Use **highlighting** or colored text to facilitate the analysis by your faculty hosts.

**END**