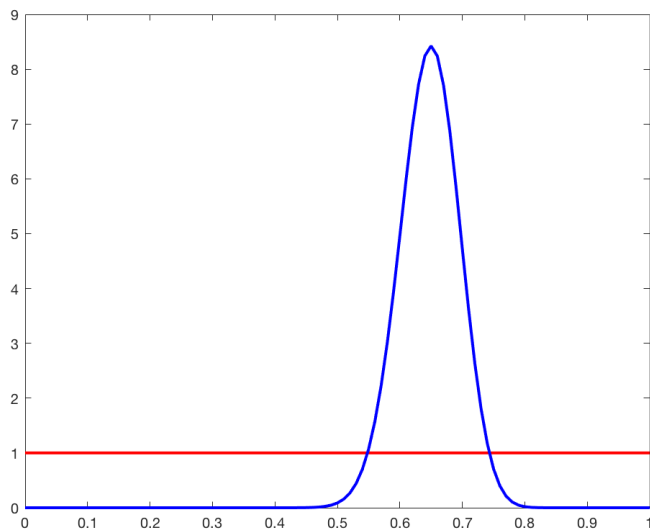# Problem Assignment 3

Problem 1:
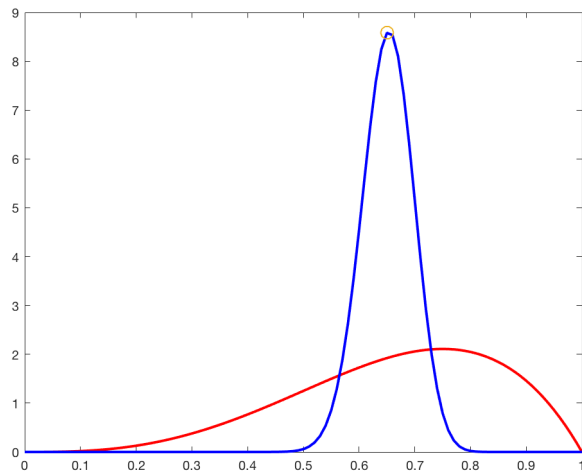
1. An ML estimate of θ is .65
2. Blue line = posterior, red line = prior

3. θmap = (a1 + N1 – 1)/(a1 + a2 + N1 +N2 – 2)
   = (1 + 65 – 1)/(1 + 1 + 65 + 35 – 2)
   = 65/100
   = .65
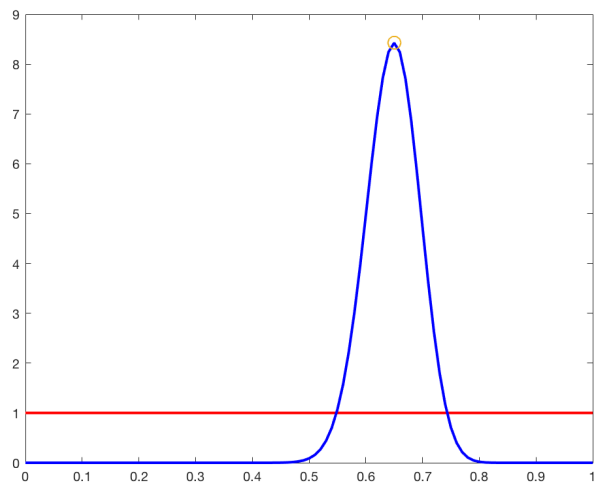
4. θmap = (a1 + N1 – 1)/(a1 + a2 + N1 +N2 – 2)
   = (4 + 65 – 1)/(4 + 2 + 65 + 35 – 2)
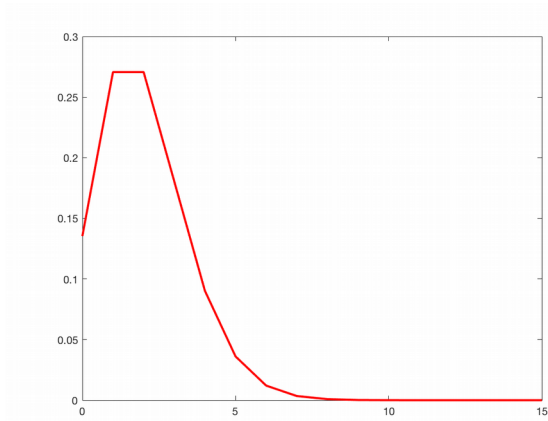   = 68/104
   = .653846
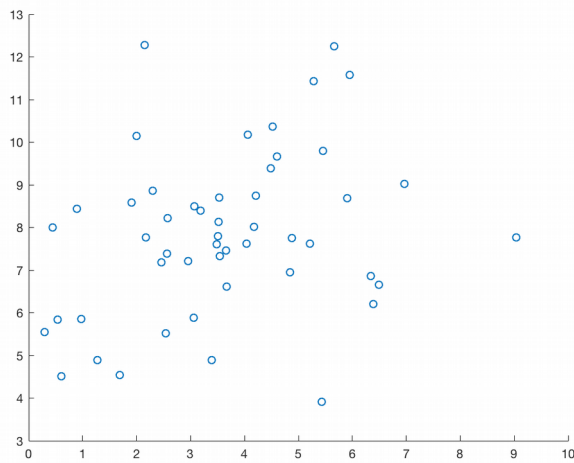
Problem 2:

1.
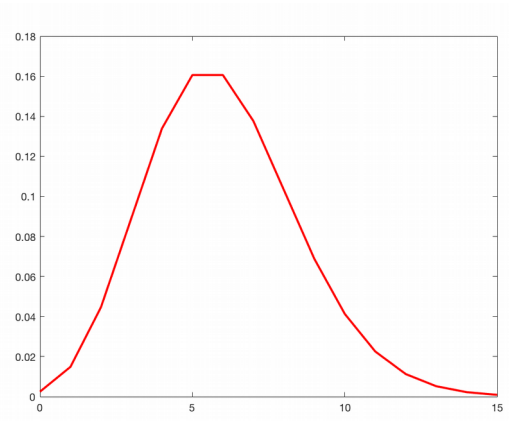2. ML estimate for the mean: 3.6377, 7.8506
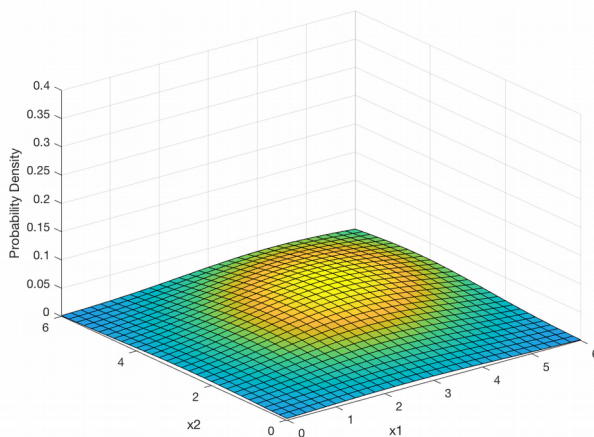
3.
4. I believe that the multivariate model is better because it will be easier for us to see dependencies between variables.
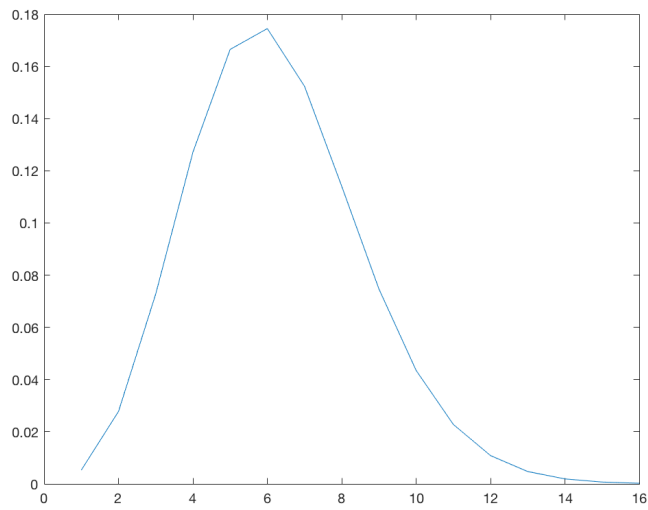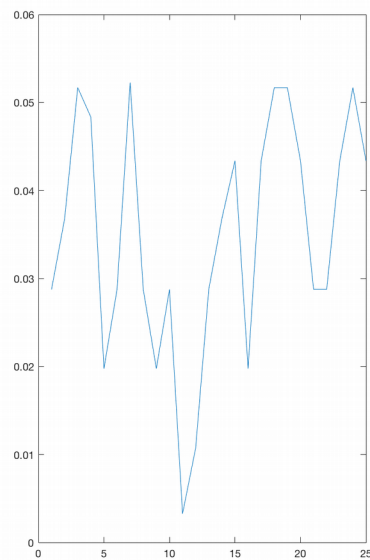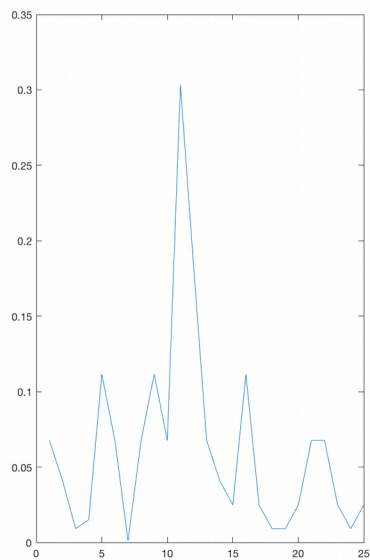
Problem 3:

1. lambda = 2

lambda = 6

2. ML = 5.2400

3. left side is a = 1, b = 2, right side is a = 3, b = 5

4. Gamma(λ|a + sum(data) , b/(nb + 1))
   a = 1, b = 2
   Gamma(λ| 1 + 131, 2/(25*2 + 1))
   Gamma(λ|132, .03921)
   a = 3, b = 5
   Gamma(λ| 3 + 131, 5/(25*5 + 1))
   Gamma(λ|132, .0397)
   Left is a = 1, b = 2. Right is a = 3, b = 5