Alejandro López Vázquez A01171715

Assignment 2

1. M
2. M
3. Marginal
4. Marginal density is α= (1-p)/p and β=n

The conditional density is μ~gamma

1. The F distribution in this case relates to the Beta distribution with the equation
2. By transforming it into a multivariate distribution making ~ Bin(20, 0.5\*θ) so we define

We obtain the fisher information for both θ’s their combination an the hessian matrix

Giving

1. The relationship between them is that when the flat prior density g(θ) = 1 then the posterior expectation of θ will be the same as the MLE θ
2. T
3. With a Bayessian approach the way to estimate theta would be to first use the known probability of 0.5 heads and 0.5 tails as a prior in which case the conjugate prior of the binomial is the beta

Where is the times that the coin landed in heads and the times that it landed on tails.

For the probability of the event happening because we have a likelihood with binomial distribution and a beta prior we obtain that:

After obtaining this we join it to obtain the probability of obtaining heads that would be