Assigment_Solution

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1

The marginal posterior distribution $\pi(\mu|X1,\dots Xn)$ is student- t distribution with degree of freedom $2a+n$

Posterior predictive distribution of Xn+1, i.e., $\pi(Xn+1|X1,\dots Xn) = \int\int \pi(Xn+1|\mu,\sigma^2) * \pi(\mu,\sigma^2|X1,\dots,Xn)dud\sigma^2$

where u belongs to R and σ^2 belongs to $(0,+inf)$

2

3

The posterior distribution of $\theta = \lambda_1/(\lambda_1+\lambda_2)$ is $Beta\big((\sum_{i=1}^{n} X_i + Y_i) + 2 * a, n+b\big)$

The 95% HPD credible interval of θ is (0.4836529,0.7250935) .

5

Both the heatmaps are quite similar and both have positive correlation

For 1d kernel estimate part both X and Y have same mean = 0 and different variance