

Stat 343 - Potential Quiz 3 Topics

This quiz will have three questions:

1. Given a data model and a conjugate prior distribution, find the posterior distribution and its parameters.
2. Foundations related to bias, variance, MSE. I'll ask you one of the following:
 - Define bias of an estimator. In general, do we prefer bias to be large or small? Why?
 - Define an unbiased estimator
 - Define variance of an estimator. In general, do we prefer variance to be large or small? Why?
 - Define MSE. In general, do we prefer MSE to be large or small? Why?
 - What is the relationship between the bias, variance, and MSE of an estimator?
3. Foundations from probability. I'll ask you one of the following:
 - Define the expected value of a function g of a random variable, $E[g(X)]$, in terms of an integral.
 - Define the variance of a random variable, $Var(X)$, in terms of an integral.
 - If I have a joint probability density (or mass) function $f_{X,Y}(x,y)$ for the random variables X and Y , how can I find the marginal distribution for X ?
 - If I have a marginal density function for X , $f_X(x)$, and a conditional density function for $Y|X$, $f_{Y|X}(y|x)$, how can I find the joint density function for X and Y ?
 - Under what condition is $f_{X,Y}(x,y) = f_X(x)f_Y(y)$?
 - Under what condition is $f_{X|Y}(x|y) = f_X(x)$?
 - State Bayes' Rule