Statistics 520

Five Minute Quiz 6

Fall 2025

1. (2 pts.)

   Complete the following sentence:

   > A $(1-\alpha)100\%$ highest posterior density credible set is a $(1-\alpha)100\%$ credible set constructed in a way so that ...

   Answer: every value inside the credible set has greater posterior density than any value outside the credible set.

2. (2 pts.)

   Consider a data model $f(\boldsymbol{y}|\theta)$ with scalar parameter $\theta \in \Theta$. For a valid analysis, indicate what must be demonstrated if one is going to use an improper prior $\pi(\theta) = 1; \ \ \theta \in \Theta$.

   Answer: That the posterior is proper, which means that

$$\int f(\boldsymbol{y}|\theta)\, \pi(\theta)\, d\theta = \int f(\boldsymbol{y}|\theta)\, d\theta < \infty.$$