

Rice STAT 533/ GS01 1283 Homework 4 Question

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Request: Please email the instructor if you find any mistakes in this document.

Question: Suppose $p_x(\theta|x)$ is a continuous posterior density with respect to Lebesgue measure and θ a scalar parameter.

- a. If the posterior is unimodal, show that the highest posterior density (HPD) region is an interval.
- b. Draw an example of a multimodal posterior and c_α such that the HPD is not an interval.
- c. If the posterior is unimodal and symmetric about its mode, show that the HPD region is equivalent to the equal-tailed / quantile interval.