Homework 9 - December 1, 2016. Questions.

Intermediate Statistics (Carnegie Mellon University)

1. Let $X_1, \ldots, X_n \sim N(\theta, 1)$ and let $\theta \sim N(a, b^2)$.

    (a) Find the posterior distribution $p(\theta | X_1, \ldots, X_n)$.

    (b) Find c_n such that
    $$P(\theta \in C_n | X_1, \ldots, X_n) = 1 - \alpha$$
    where $C_n = [\overline{\theta}_n - c_n, \overline{\theta}_n + c_n]$ and $\overline{\theta}_n$ is the posterior mean.

    (c) Find
    $$\mathsf{Cov}_{C_n}(\theta) = P_\theta(\theta \in C_n),$$
    the frequentist coverage of C_n.

2. Chapter 11, problem 3. Also, find the posterior mean of θ.

3. Chapter 11, problem 4.

4. Chapter 11, problem 6a.

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