Assignment 8

PM522b Introduction to the Theory of Statistics Part 2

Due: April 3, 2018

1. Suppose we have a sample of size 6 from a population with pdf $f(x|\theta) = (1/\theta)e^{-x/\theta}$, $x > 0$. We wish to test $H_0 : \theta = 1$ versus $H_1 : \theta > 1$. Let the rejection region be defined by $\sum_{i=1}^{6} X_i > 8$.
   - a) Find α, i.e. P(type I error)
   - b) Find β for $H_1 : \theta = 2$, i.e. P(type II error)
2. Let $X_1, ..., X_n \sim N(\mu, \sigma^2)$. Suppose we want to test the hypothesis $H_0 : \mu = 5$ versus $H_1 : \mu > 5$. For $S^2 = 30$ and $\alpha = 0.05$, compute and plot the power curves in R for $n_1 = 25$ and $n_2 = 150$. Plot two additional curves when $\alpha = 0.01$.
3. CB 8.1
4. CB 8.2