HOMEWORK ASSIGNMENTS

Homework #6  
Assigned: 12/8/14  
Due: 12/16/14

1. (a) Problem 11.11 in John Freund’s text book.
(b) Problem 11.12 in John Freund’s text book.

2. (a) Problem 11.19 in John Freund’s text book.
(b) Let $X_1, \ldots, X_n$ be a random sample from Normal($\mu_1, \sigma^2$) and independently let $Y_1, \ldots, Y_n$ be a random sample from Normal($\mu_2, \kappa \sigma^2$), where both $\mu_1, \mu_2, \sigma^2, \kappa > 0$ are all unknown. Find a $100(1 - \alpha)$% confidence interval for $\kappa$.

3. Problem 11.33 in John Freund’s text book. Please compute a 95% confidence interval rather than a 90% confidence interval (requested by text book). Please pretend that $\sigma_1$ and $\sigma_2$ are sample standard deviations. [Hint: Check whether $\sigma_1$ can be taken equal to $\sigma_2$ (population variances) using the $f$ interval, and then use the pooled $t$ interval. Use statistical tables at the back of the book.]

4. (a) Problem 12.1 in John Freund’s text book.
(a) We wish to test the parameter, $\theta$, in Binomial($n, \theta$). Consider the two hypothesis tests (simple versus simple),
(i) $H_o: \theta = \theta_0$ vs $H_1: \theta = \theta_1, \theta_1 > \theta_0$;
(ii) $H_o: \theta = \theta_0$ vs $H_1: \theta = \theta_1, \theta_1 < \theta_0$.
Find a test statistic if the MLE, $\hat{\theta}$, is used as an estimator of $\theta$. What are the acceptance and rejection intervals for the two tests?

5. (a) Problem 12.7 in John Freund’s text book.
(b) Problem 12.9 in John Freund’s text book.

6. (a) Problem 12.11 in John Freund’s text book.
(b) For Problem 12.11 in John Freund’s text book, find a uniformly most powerful size $\alpha$ critical region for testing $H_o: \theta \leq \theta_o$ versus $H_1: \theta > \theta_o$.