

Stat GR5205, Fall 2017

Assignment #5: Due October 30

1. Consider a n -dimensional random variance X with mean covariance matrix Σ . Let A be a $k \times n$ matrix. Show that the covariance matrix of $Y = AX$ is $A\Sigma A^\top$.
2. Consider linear model $y = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p + \varepsilon$ and $\varepsilon \sim N(0, \sigma)$ and hypotheses

$$H_0 : \beta_1 = 0 \quad H_1 : \beta_1 \neq 0.$$

Show that t -test and F -test are equivalent in the sense that the $T^2 = F$ where T is the t -statistic and F is the F -statistic.

3. Chapter 6, problem 5, a. b. c. f.
4. Chapter 6, problem 7.
5. Chapter 6, problem 8.
6. Chapter 6, problem 25.