Stat 351 Fall 2006
Assignment #7

- (Problem #10, page 145) Suppose that X_1 and X_2 are independent $N(0,1)$ random variables. Set $Y_1 = X_1 - 3X_2 + 2$ and $Y_2 = 2X_1 - X_2 - 1$. (a) Determine the distributions of Y_1 and Y_2. (b) Determine the distribution of $\mathbf{Y} = (Y_1, Y_2)'$.

- (Problem #11, page 145) Let $\mathbf{X}$ have a three-dimensional normal distribution with mean vector $\boldsymbol{\mu}$ and covariance matrix Λ given by

$$\boldsymbol{\mu} = \begin{pmatrix} 3 \\ 4 \\ -3 \end{pmatrix} \quad \text{and} \quad \Lambda = \begin{pmatrix} 2 & 1 & 3 \\ 1 & 4 & -2 \\ 3 & -2 & 8 \end{pmatrix},$$

  respectively. If $Y_1 = X_1 + X_3$ and $Y_2 = 2X_2$, determine the distribution of $\mathbf{Y} = (Y_1, Y_2)'$.

- (Problem #13, page 145) Suppose that Y_1, Y_2, and Y_3 are independent $N(0,1)$ random variables. Set

$$\begin{aligned} X_1 &= Y_1 - Y_3, \\ X_2 &= 2Y_1 + Y_2 - 2Y_3, \\ X_3 &= -2Y_1 + 3Y_3. \end{aligned}$$

  Determine the distribution of $\mathbf{X} = (X_1, X_2, X_3)'$.

- (Problem #14, page 145) Suppose that X_1, X_2, and X_3 are independent $N(0,1)$ random variables. Set

$$\begin{aligned} Y_1 &= X_2 + X_3, \\ Y_2 &= X_1 + X_3, \\ Y_3 &= X_1 + X_2. \end{aligned}$$

  Determine the distribution of $\mathbf{Y} = (Y_1, Y_2, Y_3)'$.

- Exercise 4.2, page 127
- Exercise 4.3, page 127 ?
- Exercise 5.2, page 129
- Exercise 5.3, page 129
- Exercise 7.1, page 135