SSIE 660: Stochastic Systems

Homework assignment 4

Seo. 26, 2016
Due: Oct. 10, 2016, Before class starts

1. Find the MGF of a continuous uniform density function in the range (A, B). Obtain $E(X)$ and $\text{Var}(X)$, by differentiating the MGF.

2. Let X_1 and X_2 be two independent random variables with the density function

$$f(x_i) = \begin{cases} e^{-x_i}, & x_i > 0 \text{ for } i = 1, i = 2 \\ 0, & \text{elsewhere} \end{cases}$$

   (a) Find the MGF of $Y = 5X_1$.
   (b) Find the MGF of $V = X_1 + X_2$.

3. A total of 11 people, including you, are invited to a party. The times at which people arrive at the party are independent uniform (0,1) random variables. Find the expected number of people who arrive before you. Find the variance of the number of people who arrive before you.

4. Solve Chapter 3. Problem 1.

5. Solve Chapter 3. Problem 3.

6. Solve Chapter 3. Problem 7.