**MULTIVARIATE DATA ANALYSIS (*BIA 652)***

Spring 2017

Homework 3

**REVIEW OF PROBABILITY**

1. We roll two die and sum the outcome. For example if the roll is 2 & 5 then X=7
2. 10 points) Plot Probability Density Function (PDF) of X
3. 5 points) Which outcome has the highest probability?
4. 10 points) Plot the Cumulative Distribution Function (CDF) of X
5. 5 points) Calculate E[X]
6. 5 points) Calculate Var[X]
7. X and Y are independent random variables with uniform distribution U[0,1]
8. 5 points) Generate 100 realization of (X,Y)
9. 10 points) Let Z = X+Y and V = X-Y. Plot the sample CDF of Z and V
10. 10 points) Plot histogram of Z and V
11. 5 points) Calculate E[Z] and Var[Z]
12. 5 points) Estimate E[Z] and Var[Z] using the sample
13. 5 points) Calculate E[V] and Var[V]
14. 5 points) Estimate E[V] and Var[V] using the sample
15. X is a random variable with density function f(x) = 2x if 1 ≥ x ≥ 0 and f(x) = 0 otherwise.
    1. 5 points) Plot the density function of X
    2. 5 points) Plot CDF of X
    3. 10 points) Calculate E[X] and Var[X]