**Applied Regression Analysis**

**Homework 1**

**Exercise 1.1 (modified):** The teengamb dataset in the faraway package concerns a study of teenage gambling in Britain. Make a numerical and graphical summary of the data, commenting on what you notice. Specifically:

1. Clean the data. (Show your work).
2. Calculate and provide numerical summaries for all variables. Comment on the numerical summary for each variable.
3. Construct and provide at least one univariate graphic for each variable. Comment on any interesting features of each plot.
4. Construct bivariate graphics for each combination of variables (10 plots). Comment on any relationships you notice.
5. Construct and provide densities of all quantitative variables split by sex. Comment on the similarities or differences in the distribution of each variable for the males and females.

Note: make sure to write out any sum or integral you need to compute, even if you use a computer to compute the sum or integral.

1. Suppose that a random variable Exponential(), meaning that the pdf of is . Determine the mean and variance of .
2. Suppose that Exponential(). Determine the mean and variance of .
3. Suppose that random variables and have a joint pdf given by . Determine , , , , , and . (Careful on the limits of integration).
4. Suppose that is a bivariate normal random vector with mean and  
   What is the distribution, mean, and variance of , where .
5. Using the same as in problem 4, determine the distribution, mean, and variance of , where