STAT 575
Homework 1 Problems
due Friday January 29 at 2PM!

5 Mutiple Choice Problems to be graded. Please see Course Documents Folder on Blackboard for Selecting Multiple Choice Answers

1. A blood test indicates the presence of a particular disease 95% of the time when the disease is actually present. The same test indicates the presence of the disease 0.5% of the time when the disease is not present. One percent of the population actually has the disease. Calculate the probability that a person has the disease given that the test indicates the presence of the disease.

2. A recent study indicates that the annual cost of maintaining and repairing a car in a town in California averages 200 with a variance of 260. If a tax of 20% is introduced on all items associated with the maintenance and repair of cars (i.e., everything is made 20% more expensive), what will be the variance of the annual cost of maintaining and repairing a car?

3. A car dealership sells 0, 1, or 2 luxury cars on any day. When selling a car, the dealer also tries to persuade the customer to buy an extended warranty for the car. Let X denote the number of luxury cars sold in a given day, and let Y denote the number of extended warranties sold, where: P(X=0, Y=0) = 1/6; P(X=1, Y=0) = 1/12; P(X=1, Y=1) = 1/6; P(X=2, Y=0) = 1/12; P(X=2, Y=1) = 1/3; P(X=2, Y=2) = 1/6 What is the variance of X?

4. Let T denote the number of days that elapse before a high-risk driver is involved in an accident. Assume T is exponentially distributed with unknown parameter beta (your books notation (2.50a)). An insurance company expects that 30% of high-risk drivers will be involved in an accident during the first 50 days of the calendar year. What proportion of high risk drivers are expected to be involved in an accident during the first 80 days of a calendar year?

5. Claims filed under auto insurance policies follow a normal distribution with mean 19,400 and standard deviation 5,000. What is the probability that the average of 25 randomly selected claims exceeds 20,000?