Homework Assignment #2

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

All calculations should be done in Word using Equation Editor and all charts and graphs should be done in Excel.

# 1)

In the judicial case of the United States vs. the City of Chicago, discrimination was charged in a qualifying exam for the position of Fire Captain. In the table below, Group A was the minority and Group B was the majority. Use this table to answer questions a) – e)

|  |  |  |
| --- | --- | --- |
|  | **Passed** | **Failed** |
| Group A | 25 | 22 |
| Group B | 410 | 156 |

a) If one of the test subjects is randomly selected, find the probability of getting someone who passed the exam.

b) Find the probability of randomly selecting one of the test subjects and getting someone who is in Group B **or** passed.

c) Find the probability of randomly selecting two different test subjects and finding that they are both is Group A.

d) Find the probability of randomly selecting one of the test subjects and getting someone who is in Group A **and** passed the exam.

e) Find the probability of getting someone who passed, given that the selected person is in Group A.

# 2)

About 17% of the population has blue eyes. If a person is randomly selected, what is the probability that he or she does not have blue eyes? If four different people are randomly selected, what is the probability that they all have blue eyes? Would it be unusual to randomly select four people and find that they all have blue eyes? Why or why not?

# 3)

You are trying to develop a strategy for investing in two difference stocks. The anticipated annual return for a $1,000 investment in each stock under four difference economic conditions has the following probability distribution:

|  |  |  |  |
| --- | --- | --- | --- |
| **Probability** | **Economic Condition** | **Returns Stock A** | **Returns Stock B** |
| 0.15 | Recession | -25 | -75 |
| 0.25 | Slow Growth | 20 | 55 |
| 0.35 | Moderate Growth | 100 | 130 |
| 0.25 | Fast Growth | 150 | 200 |

a) Compute the expected return for Stock A and for Stock B

b) Compute the standard deviation for Stock A and for Stock B

c) Would you invest in Stock A or Stock B? Explain.

# 4)

In South Carolina Palmetto Cash 6 lottery game, winning the jackpot requires that you select the correct 6 numbers between 1 and 57. How many different ways can those 6 numbers be selected? What is the probability for winning the jackpot? Is it unusual for anyone to win the lottery? Explain.

Use Excel to calculate the first question.

# 5)

Sun Microsystems has 64% of the market for high-end Unix machine, with its closest competitor being IBM. Suppose 17 corporations were in the market to purchase a high-end Unix machine.

Use Excel to answer b) – d) (Hint: Assume a Binomial Distribution)

a) How many Unix machines would Sun Microsystems “expect” to sell?

b) What is the probability that exactly 7 corporations purchase a Unix machine, from Sun Microsystems?

c) What is the probability that less than 11 corporations purchase a Unix machine from Sun Microsystems?

d) What is the probability that 9 or more corporations purchase a Unix Machine from Sun Microsystems?

# 6)

Dutchess County, New York, has been experiencing a mean of 67 motor vehicle deaths each year.

Use Excel to answer a – c) (Hint: Assume a Poisson Distribution)

a) Find the mean number of deaths per day.

b) Find the probability that on a given day, there are 2 or more motor vehicle deaths.

c) Find the probability that on a given day, there are no motor vehicle deaths.