MGT 233 – Homework #2, Fall 2016

This homework assignment is due at the beginning of class on Monday, October 10, 2016.

Instructions: Use proper probability notation for all parts of each problem. Show all work in order to receive full credit. For all normal distribution include a graph indicating the mean and shade the area under investigation. For your own sake be neat.

Problem #1

Greenwater.com - As the industry leaders in cloud testing for mobile apps, GreenWater commissioned the study to raise awareness around app user behavior following of one of the world's largest sporting events. A survey was conducted online within the United States by GreenWater in the summer of 2016 among 2,035 adults ages 18 and older, among which 1,289 are smartphone/tablet owners.

GreenWater announces the results of the Rio de Janeiro Olympics Second Screen Survey, which shows that 45% of smartphone/tablet owners used apps to watch the Rio de Janeiro Summer Olympics Diving Competition. In a sample of 20 smartphone/tablet owners:

a) How many people do you expect, of those surveyed, used apps to watch the Rio de Janeiro Olympics diving competition?

b) Compute the variance and standard deviation of the number of people who used apps to watch the Rio de Janeiro Summer Olympics diving competition.

c) What is the probability that 10 current smart phone/tablet owners, of those surveyed, used apps to watch the Rio de Janeiro Summer Olympics diving competition?

d) What is the probability six or fewer smart phone/tablet owners, of those surveyed, used apps to watch the Rio de Janeiro Summer Olympics diving competition?

e) What is the probability at least 16 smart phone/tablet owners, of those surveyed, used apps to watch the Rio de Janeiro Summer Olympics diving competition?

f) What are the probability 10, 11, or 12 smart phone/tablet owners, of those surveyed, used apps to watch the Rio de Janeiro Summer Olympics diving competition?

g) Suppose a corrected news article listed that 36% of current smart phone/tablet owners used apps to watch the Rio de Janeiro Summer Olympics diving competition. What is the probability that of the 20 people sampled, exactly 5 smart phone/tablet owners used apps to watch the Rio de Janeiro Summer Olympics diving competition? (Calculate using the equation)

Problem #2

Msn.com - A new survey finds that electronic books are increasingly popular in the U.S. market with almost a quarter of readers in the country using one. According to the survey. E-book owners increased from 4 percent in May 2013 to 19 percent in November 2015, while people with tablets jumped from 3 percent to 25 percent during the same period.

If E-book ownership is 9% in Kearney, answer the following.

a) In a sample of 10 individuals, what is the probability 4 persons own E-book?

b) In a sample of 12 individuals what is the probability at least 3 persons own E-books?

c) In a sample of 15 individuals, what is the probability no more than 5 persons own E-books?

d) In a sample of 9 individuals, what is the probability that 2, 3, 4, or 5 persons own E-books?

Problem #3

Foxnews.com - Teenagers in the United States are experiencing higher levels of stress than many adults, USA Today reported. According to the American Psychological Association's survey, more than 1,000 teenagers and 2,000 adults answered questions about their overall stress levels and coping habits. Teenagers' stress levels increase due to a variety of stressors, including school, work, family and friends.

The teenagers surveyed said they were suffering from irritability or angriness (40 percent), nervousness or anxiety (30 percent) or depression and sadness (33 percent) because of their stress.

In a sample of 12 teenagers:

a) What is the probability that at least 6 teens were suffering from nervousness or anxiety?

b) What is the probability that none of the teens were suffering from nervousness or anxiety?

c) What is the probability that fewer than 7 teens were suffering from irritability or angriness?

d) What is the probability that 7, 8, 9, or 10 teens were suffering from irritability or angriness?

e) What is the probability that all twelve of the teens were suffering from irritability or angriness?

Problem #4

Nebraska.tv - with just two months until its April 29 grand opening, the clock is ticking for Hy-Vee, which is going up at Third Avenue and West 52nd Street in Kearney! Besides the grocery store, Hy-Vee will feature a gas station and a full service restaurant named the Market Grille. The restaurant will be a sports bar with 65 craft beers on tap and 13 big screen televisions, and it will also feature a sushi bar.

The store Manager of Hy-Vee in Kearney estimated that for the month May there will be 62 thousand customer visits at the new store during its peak shopping period hours (between 10am to 8pm).

a) How many customer visits are expected at the Kearney Hy-Vee in one minute in May?

b) How many customer visits are expected in 30 seconds in May?

c) What is the probability of exactly 4 consumer visits in one minute in May?
    (calculate by hand using the appropriate equation)

Problem #5

Rosefarm.com - The rose is native to the United States. The oldest fossilized imprint of a rose was left on a slate deposit in Florissant, Colorado, which is estimated to be 35 million years old. Columbus discovered America because of a rose! On October 11, 1492, while becalmed in the Sargasso Sea, one of the crewmen picked a rose branch from the water. This sign of land renewed their hope for survival and gave the seafarers the courage to continue on to the New World.

Historically on Valentine's Day, Kearney Floral sells 60 bunches of roses during its 8:00am to 6:00pm business hours. What is the probability that on Valentine's Day Kearney Floral will sell:

a) No bunches of roses in 30 minutes?

b) 5 or fewer bunches of roses in 2 hours?

c) 7 or more bunches of roses in 45 minutes?

d) 6, 7, 8, or 9 bunches in 2.5 hours?

Problem #6

CBSLA.com -What Is the Busiest Highway in the USA? a new report shows people drove more than 84.7 billion miles overall on California highways in 2015 — more than 900 times the distance from Earth to the Sun. The Los Angeles I-405 from Interstate 5 down to Long Beach serves an estimated 379,000 vehicles per day, making it the busiest interstate in America.

Use the following information and timeframe for the questions below. There were 3,600 vehicles that exited the Long Beach I-405 exit last Monday between 4:00pm to 6:00pm.

a) How many vehicles are expected to exit at Long Beach in four seconds on Monday?

b) What is the probability that no vehicles are expected to exit at Long Beach in four seconds?

c) What is the probability that 8 or fewer vehicles exit at Long Beach in forty seconds?

d) What is the probability that 16 or more exit at Long Beach in forty seconds?

e) What is the probability that 16 to 20 exit at Long Beach in forty seconds?

f) What is the probability that exactly 18 exit at Long Beach in forty seconds?

Problem #7

Kaptest.com - GMAT scores are used by business schools to provide a common yardstick to compare candidates for admission. Although the median score is approximately 540, the latest U.S. News and World Report guide reports that the average GMAT scores of the top programs— such as Stanford, Sloan, Kellogg and Wharton — around 709.

GMAT scores are normally distributed. At UNK the MBA (Masters in Business Administration) students have an average GMAT score of 592:

a) Suppose you learn that 5% of student that are accepted for an MBA at UNK score of at or below 550 on the GMAT, what is the standard deviation of the score? (round this calculation to two decimal points)

b) What is the probability of randomly selecting a student who has a score of at least 600 on the GMAT?

c) What is the probability of randomly selecting a student who has a score falling between 575 and 610 on the GMAT?

d) The top 3% of the UNK MBA students have at least what GMAT score?

Problems # 8

Costco Wholesale Corporation is a membership-only warehouse club that provides a wide selection of merchandise. As of July 2016, it is the second largest retailer in the United States, the seventh largest retailer in the world and the largest membership warehouse club chain in the United States.

On average a Costco customer spends $150 each visit with a standard deviation of $50. Costco customer spending patterns are normally distributed.

a) What is the probability a Costco customer spends $71or less?

b) What is the probability that Costco customer will spend at least $60?

c) What is the probability a Costco customer spends between $110 and $180?

d) How much would Costco customer need to spend to be in the top 1% of all Costco customers?

e) How much would Costco customer need to spend to be in the bottom 10% of all Costco customers?

Problem #9

Priceline.com is an American company and a commercial website that claims to help users obtain discount rates for travel-related purchases such as airline tickets and hotel stays. It is a buying service, which allows you to "name your own price" for airline tickets, rental cars and hotels.

On average, the time customers spend booking airline tickets on Priceline.com is 13 minutes with a standard deviation of 3 minutes. Assume the time processing the booking is normally distributed.

a) What is the probability that it takes more than 11 minutes to book an airline ticket on Priceline.com?

b) What is the probability that it takes 10 minutes or less to book an airline ticket on Priceline.com?