Module/Week 6 Homework: Probabilities and Statistics
MGMT 5260: Decision-Making Techniques for Managers

Please create a single Excel file with each problem on a separate worksheet tab.

Problem 1
A fair coin was tossed 3 times. Calculate the probabilities of the following 5 events.
   a. Three heads were observed
   b. Two heads were observes
   c. One head were observed
   d. At least two heads were observed
   e. No more than two tails were observed

Problem 2
11% of a city's population are illegal emigrants. Two random people were selected. What is the probability that:
   a. Both are legal emigrants.
   b. Only one is a legal emigrant.
   c. Both are illegal emigrants.

Problem 3
The following table shows frequency of iPads sold per day at a local electronic store in January of the current year. During that month, there was never a day in which more than 5 iPads were sold.

Number sold per day	Number of Days
0	3
1	5
2	10
3	4
4	6
5	3

   a. Determine the mean number of iPads sold per day in January.
   b. What is the probability that exactly 4 iPads will be sold in a randomly selected day?
   c. What is the probability that 1 or 3 iPads will be sold in a randomly selected day?
   d. What is the probability that no more than 2 iPads will be sold in a randomly selected day?
   e. What is the probability that at least 3 iPads will be sold in a randomly selected day?

Problem 4

A variable Z is normally distributed with μ=54 and σ=12.3. Find the following probabilities:

   a. $P(40 < Z \leq 55.7)$
   b. $P(Z = 64.9)$
   c. $P(Z > 54)$
   d. $P(Z < 48.1)$
   e. $P(Z \neq 63.4)$
   f. $P(Z \leq 70)$
   g. $P(Z < 38.2 \text{ OR } Z > 57.3)$

Problem 5

Using Excel's standard functions:

   a. Calculate the mean, variance and standard deviation of the students' grades presented below.
   b. Use the descriptive statistics tool and calculate various statistical measures.

90	93	63	55	93	85	79	95	83	61	82	95
66	51	99	50	95	63	69	90	59	57	63	77
75	54	69	67	79	52						

Problem 6

The life of an electronic transistor is normally distributed with a mean of 500 hours and a standard deviation of 80 hours. Determine the probability that

   a. A transistor will last for more than 400 hours?
   b. A transistor will last for less than 350 hours?
   c. A transistor will last exactly 501 hours?

Problem 7

The weight of bags of fertilizer is normally distributed with a mean of 50 pounds and standard deviation of 6 pounds. What is the probability that a bag of fertilizer will weigh:

   a. Between 45 and 55 pounds?
   b. At least 56 pounds?
   c. At most 49 pound?

Problem 8

The amount of time devoted to studying each week by students who achieve grade A in the course is normally distributed with mean of 7.5 hours and standard deviation of 2.1 hours. Find the probability that an A student study time per week is

   a. between 7 and 9 hours?
   b. less than 5 hours?
   c. exactly 6 hours