Homework 2
Elementary Statistics & Inference (STAT:1020; Bognar)

1. The expenditures (in dollars) of 3 customers at a coffee shop were: 2.25, 2.25, 4.50.
   (a) Find the sample mean $\bar{x}$.
   (b) Find the sample standard deviation s.
   (c) Find the sample variance s^2.
2. Consider the following dataset: 8, 8, 10, 8, 6.
   (a) Find the sample mean $\bar{x}$.
   (b) Find the sample standard deviation s.
   (c) Find the sample variance s^2.
3. Textbook 12.32 (a), (b)
4. Textbook 12.34 (a), (b)
5. Textbook 12.36 (a), (b), (c)
6. Textbook 12.42 (a), (b), (c), (d)
7. Suppose a standard 6-sided die is rolled 4 times. How many outcomes are in the sample space $\mathcal{S}$?
8. Suppose a 6-sided die (with sides labeled 1, 2, 3, 4, 5, 6) is rolled 2 times.
   (a) Write out the sample space $\mathcal{S}$. *Note that all outcomes are equally likely.*
   (b) Let A denote the event that a 1 is obtained on the first roll, and let B denote the event that an even is obtained on the second roll. Find $P(A \text{ and } B)$.
   (c) Find the probability that the second roll is exactly twice the first roll.
   (d) Find the probability that the second roll is greater than or equal to the first roll.
9. Suppose we have a litter of 7 puppies. 5 of the puppies are female and 2 are male. The number of spots on the fur of the female puppies is 1, 1, 2, 2, 3. The number of spots on the fur of the male puppies is 1, 3. In other words, we have
   $$F1, F1, F2, F2, F3, M1, M3$$
   One puppy is randomly selected. Consider the following events.
   $$A = \text{female} \qquad B = \text{male} \qquad C = 1 \text{ spot} \qquad D = 2 \text{ spots}$$
   (a) Find the probability the randomly selected puppy is female, i.e. find $P(A)$.
   (b) Find the probability the randomly selected puppy has 1 spot, i.e. find $P(C)$.
   (c) Find the probability the randomly selected puppy is female and has 1 spot, find $P(A \cap C)$.
   (d) Use the addition rule to find the probability the randomly selected puppy is male or has 2 spots, i.e. find $P(B \cup D)$.
   (e) Use the addition rule to find the probability the randomly selected puppy is female, has 1 spot, or both, i.e. find $P(A \cup C)$.
   (f) Use the addition rule to find the probability the randomly selected puppy is male, has 1 spot, or both, i.e. find $P(B \cup C)$.