P8130: Recitation 1

1.  What type of study design is the following example?

    Suppose we are interested in the relationship between lung-cancer and heavy drinking. We conduct a study where drinking status (2+ drinks per week vs. 1 or no drinks per week) is determined at baseline and followed for 10 years to determine cancer outcomes.

2.  Twenty-five randomly selected appendectomies lasted for the following lengths of time. Construct a histogram from the following data:

    | 113 | 118 | 121 | 123 | 126 | 128 | 130 | 135 | 136 | 137 |
    |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
    | 138 | 139 | 140 | 140 | 142 | 142 | 142 | 142 | 143 | 155 |

    157   157   158   159   164

3.  Heart rates for ten asthmatic patients in a state of respiratory arrest are given below. Find the mean, median, and mode.

    167   150   125   120   150   150   40   145   120   150

    a.  What are the mean, median, and mode?
    b.  What is the five-number summary? Make a box-plot using this data.
    c.  What is the range?
    d.  What is the variance? Standard deviation? IQR?
    e.  What is the coefficient of variation?

4.  In a random sample of 200 women who were diagnosed with breast cancer, 135 were above the age of 45, 60 had a family history of breast cancer, and 40 were both above the age of 45 and had family histories of breast cancer.
    a.  How many were neither above the age of 45 nor had a family history of breast cancer?
    b.  What is the probability that a randomly selected woman is 45 or younger?

    c.   What is the probability that a randomly selected woman is older than 45 and does not have a family history of breast cancer?

    d.   What is the probability that a randomly selected woman is 45 years or younger given that she has a family history of breast cancer?

    e.   Are the events 45 years and younger and family history of breast cancer independent?

5. Let A be the event a woman has breast cancer and B be the event the woman has a BRCA gene mutation. 3% of women with breast cancer have the BRCA gene mutation.

    a.   What is the event being described here?

    b.   What is the complement of this event? What is its probability?

6. It is known that there is a 12% chance of breast cancer in a woman's lifetime. 3% of women with breast cancer have a BRCA gene mutation. Of women who do not have breast cancer, .27% have the BRCA gene mutation. What is the probability that a randomly selected woman will have breast cancer given that she has the BRCA gene mutation?