[Disclaimer: This is only a review sheet. It may or*may not* include all the material that will appear on the exam. It is meant to help you prepare for the exam, but should not be used as the sole preparation for the exam.]

Test 1 will cover the material from class between 1/30 to 3/1 (through counting).

Some of the topics you will be held accountable for are:

- Understanding the terms population, sample, parameter, and statistic

- Understanding the difference between categorical, discrete numeric and continuous numeric data

- Methods of summarizing categorical data: tables, and barplots. You should know how to read them, how to produce them and how to make comparisons based on their values

- Graphical methods of summarizing numeric data sets: stem and leaf diagram; stripcharts or dotplots; histograms and the density estimate mentioned in the computer lab; and boxplots as handled in the computer lab (that is, with the convention of marking points more than 1.5 IQR's away from the box separately).

- Numeric means to summarize a data set:

    The center the mean, and median. (How to compute them, how to estimate their values from a graphic.)

    The spread The range, variance, standard deviation, and IQR

    Position in a data set The quartiles, and z-score of a value.

- The idea of enumerating an outcome space

- The definition of probability for equally likely outcomes

- The counting rule using multiplication. The use of the formulas $_nP_r$ and $_nC_r$.

Here are some sample problems. There is no guarantee any, let alone all, of the problems on the exam will be similar to these.

1. Explain the difference between a frequency and relative frequency (proportion)

2. What do each of these symbols typically mean? $\bar{x}$, n, Σ, s, Q_1?

3. What is a sample? What is a population? What is the key difference? What is a statistic? What is a parameter?

4. Which of these variables is categorical, discrete numeric, continuous numeric?

    - Your year in school (Freshman, Sophmore,...)
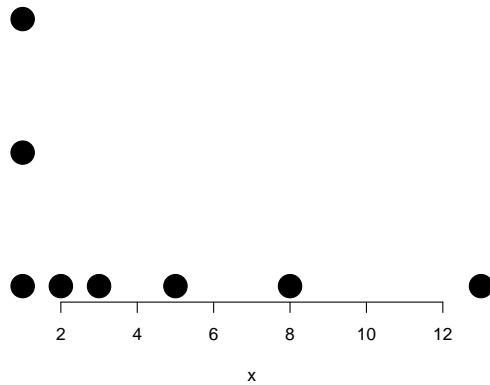   - The number of credits you have earned

- Your GPA

- Your time to commute to CSI

5. The type of car a student drives is recored in the table below

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   Domestic      Imported   No car
=================================
    10              15          5
```

- What are the relative frequencies?

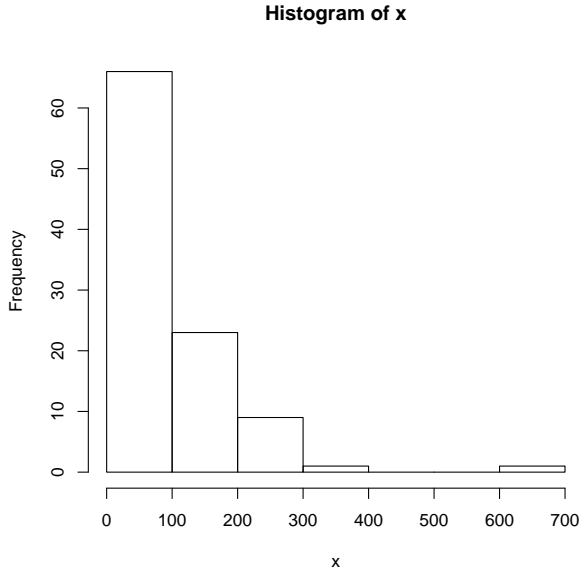- Make a barplot of the data

6. A dot plot of a dat set appears below

(a) What is the five number summary: min, Q_1, Median, Q_3, and maximum?
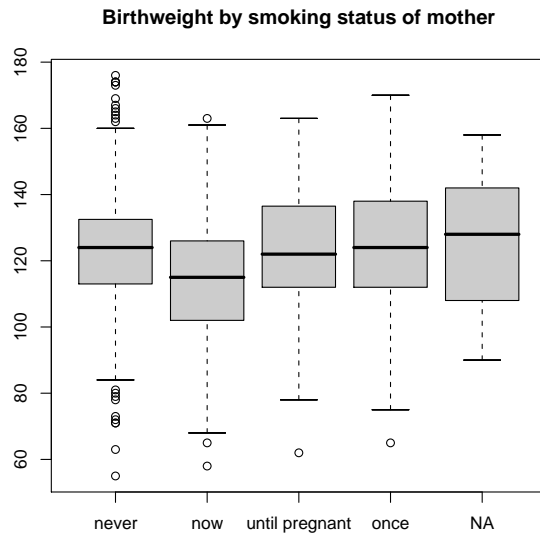
(b) What is the IQR

(c) Sketch a boxplot

7. Find the mean and standard deviation of these numbers

    2 3 3 5 7

8. Consider the histogram

Histogram of x

(a) Estimate the range of the data set.

(b) Describe the shape of the data set verbally.

(c) Estimate as best you can the mean, median and IQR of the data set.

(d) How many numbers are less than 100? More than 200?

9. The boxplots below show several different data sets.

Birthweight by smoking status of mother

- Which category has the smallest median birthweight?
- Which category has the widest spread?
- Which category has the longest tail?

- Which category, if any, shows some skew.

- What is the five-number summary for the "never" smoked category?

10. The data set

    59, 70, 80, 72, 80, 65, 82

    has sample mean 72.57 and sample standard deviation 8.638.

    (a) Find the z-score of 82.

    (b) Without working too hard is the z-score of 59 more or less than -2?

    (c) What is the percentile rank of 80?

11. Toss a coin three times keeping track of each toss.

    - Enumerate the outcome space. How large is it?
    - What is the probability of exactly 2 heads?
    - What is the probability of exactly 1 tails?
    - What is the probability of more heads than tails?
    - What is the probability of at least 1 tails?

12. The MINI Cooper website says there are more than 1,000,000 ways to build a MINI. Without getting so involved, how many different ways are there to build a mini cooper if you can choose from the following: one of 6 paint colors; a white or black roof; painted or chrome side mirrors; 15, 16 or 17-inch tires; a sunroof, convertible, or hardtop; manual or automatic; cloth, leather, or vinyl interior.

13. A combination lock has 40 numbers. You twist the knob twice past 0 then to the number, then you twist once past the first number to the second number (a number that is not your first number), finally you twist to the third number (a number that is not your second number).

    How many possible "combinations" are there? Are these combinations also "combinations" as we defined them in class?

14. A combination lock has 10 buttons labeled 0 through 9. In class we computed only 210 different combinations of 4 numbers if we couldn't repeat and order wasn't importnant. Suppose we have combinations of 3 numbers – not 4. Now how many different ones are there? How about 5 numbers?