**Name:** _____ **Date:** _____

# PSTAT 5A: Discussion Worksheet 01

Welcome to the first PSTAT 5A Discussion Section! We encourage you to solve the following problems in groups. Statistics and Data Science are not meant to be lonely fields- we have quite a bit we can learn from each other!

1. A random number generator picks a number from the set $\{1, 2\}$ at random, then picks another number from the set $\{1, 2, 3\}$ at random, and finally picks a third number from the set $\{1, 2\}$ at random. The number selected at each stage is recorded.

   **a)** Use a tree diagram to specify the outcome space of this experiment.

   **b)** Are we justified in using the classical approach to probability? Why or why not?

   **c)** Use the classical approach to probability to compute the probabilities of the following events (being sure to use proper notation!):

   **(i)** $E$ = "the first number selected is the number '1'"

   **(ii)** $F$ = "the second number selected is the number '2'"

   **(iii)** $G$ = "either the first number selected is the number '1' or the second number selected is the number '2' (or both)"

   **d)** Compute the probability that the sum of the last two numbers selected is strictly greater than the first number. **Hint:** Remember the complement rule!

2. For each of the following variables, classify them as either discrete, continuous, ordinal, or nominal, and use this to determine what type of visualization is best to plot the distribution of observations collected on each.

   **a)** `x` = the place/ranking (first, second, third, etc.) of athletes at the end of a marathon

   **b)** `y` = the number of children in various families residing in the city of Santa Barbara

   **c)** `z` = the species to which 100 different plants, selected from *Leadbetter* Beach, belong.

3. Consider a list of numbers $X = \{x_i\}_{i=1}^n$ and another list of numbers $Y = \{a \cdot x_i\}_{i=1}^n$, where $a$ is a fixed constant. In other words, the elements of $Y$ are found by taking the elements of $X$ and multiplying by $a$. Show that $\overline{y} = a \cdot \overline{x}$.

 