R bootcamp basic stats and plotting worksheet:

1. Take a look at the 'penguin' data set

   Hint: you can use functions such as head(), summary(), unique()

2. Create variables:

   a. Assign data for the Adelie species to a variable named 'adelie' and assign the subset of the data for the Gentoo species to another variable named 'gentoo'.

3. Plot some data and compare means of two variables:

   a. Plot the flipper lengths of the two species as two histograms.

   b. Now plot the flipper lengths of the two species so that you can compare them more easily (**Hint**: what is a good plot for summarizing means or medians?)

   c. Is there a statistically significant difference between the flipper lengths of the two species?

   d. Plot and compare two other measures of your choosing.

4. Compare the means of more than two variables:

   a. Plot the flipper length of all three species (**Hint**: you can do this in one figure)

   b. Add a legend with species names.

   c. Is there a statistically significant difference in flipper length among the three species? (**Hint**: use an ANOVA)

   d. Which species are significantly different? (**Hint:** run a post-hoc test)

   e. Add the information from the post-hoc test to your figure (**Hint:** text() is a useful 'low-level' plotting tool)

5. Compare continuous variables:

   a. Plot flipper length against body mass

b. Are body mass and flipper length correlated? (**Hint:** use a Pearson's correlation)

c. Color code your plot by species, include a legend on the plot.

d. Do species differ in the relationship between body mass and flipper length?

6. Examine (plot and stats) the relationship between ***bill*** length and ***flipper*** length. Is the relationship between these two variables the same across the three species?