Coding Homework #3

Instructions

1. Make a *Markdown Cell* that contains the following information:

- Your name (small header)
- The name of this class (italicized)
- The date (bolded)

2. Make a *Code Cell* that imports `numpy` as `np`, `matplotlib.pyplot` as `plt`, and `scipy.stats` as `stats`.

3. Make a *Code Cell* that imports your `v_rest_sst.csv` and `v_rest_pvalb.csv` variables as `numpy` arrays called `v_rest_sst` and `v_rest_pvalb` respectively.

4. Make a *Code Cell* that does the following:

a. Finds the means of `v_rest_sst` and `v_rest_pvalb`.

b. Performs a t-test to test the null hypothesis that the means of `v_rest_sst` and `v_rest_pvalb` come from different distributions.

c. Plots a histogram of `v_rest_sst` in one subplot, and a histogram of `v_rest_pvalb` in another subplot if the p-value of the t-test is > 0.05. You can make two subplots using the syntax `fig, ax = plt.subplots(1,1)`. You should use an `if` statement to accomplish this.

d. Labels the y-axis and x-axis of your histograms (recall that `ax.ylabel` and `ax.xlabel` are the methods that let you accomplish this).

5. Make a *Code Cell* that defines a function called `vrestHist()`. This function should execute the code in step 4 when called.

6. Make a *Code Cell* that calls `vrestHist()`.

7. Make a *Code Cell* that does the following:

   a. Loops through each column of `v_rest_sst` and `v_rest_pvalb` and makes a scatter plot with `v_rest_sst` on the x-axis and `v_rest_pvalb` on the y-axis.

   b. Each iteration of your loop should plot a different point on the scatter plot. At the end of your loop, you should have only one scatter plot with number of data points equal to the length of `v_rest_sst` and `v_rest_pvalb`.

c. Your loop should plot a red dot if *both* values in `v_rest_sst` and `v_rest_pvalb` are greater than -60, a green dot if values in `v_rest_sst` are greater than -60, but values in `v_rest_pvalb` are less than -60, a blue dot if *both* values in `v_rest_sst` and `v_rest_pvalb` are less than -60, and a purple dot if values in `v_rest_sst` are less than -60, but values in `v_rest_pvalb` are more than -60.

d. Labels your y-axis and your x-axis (this code should be outside of your loop).

8. Make a *Code Cell* that defines a function called `vrestScatter()`. This function should execute the code in step 7 when called.
9. Save a copy of this notebook to your GitHub repo with the title "coding_homework_3.ipynb".