STSCI 4060
HW4

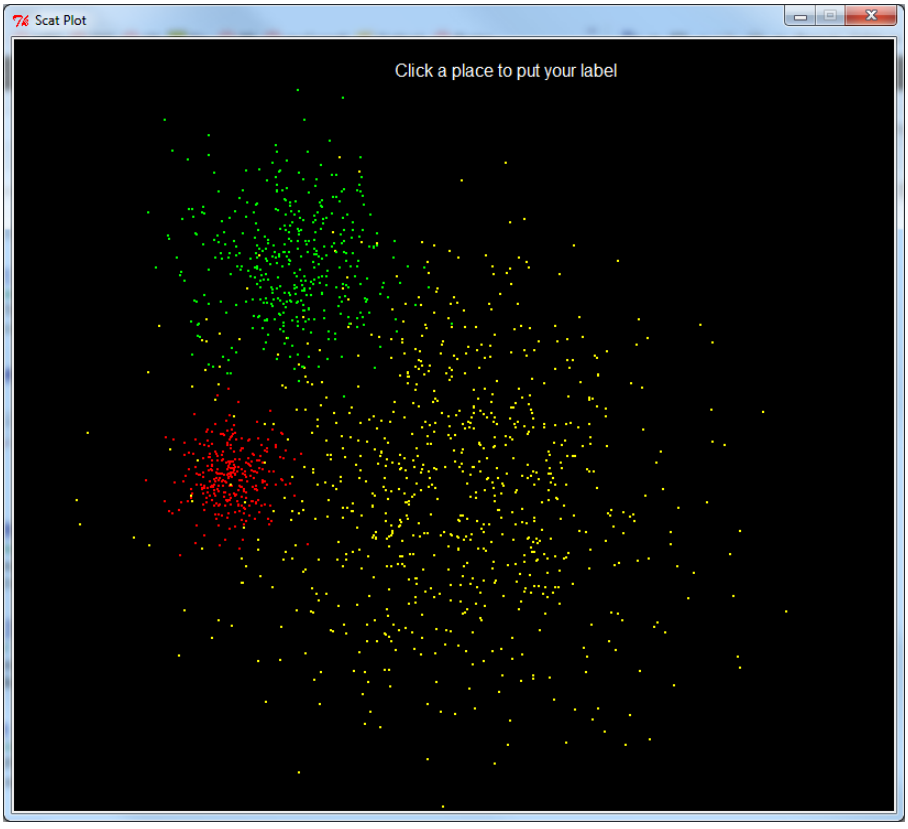
Assigned on: 3/15/2019
Due by: 11:59 PM, 3/26/2019

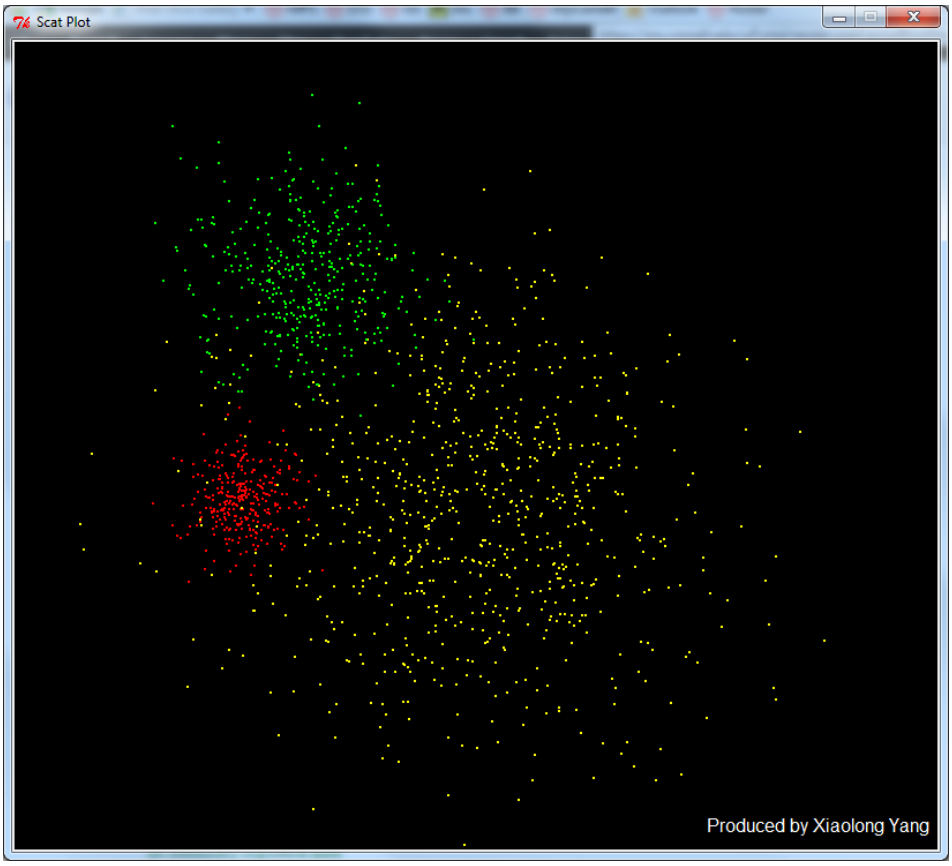
General instruction

- **Do your own work. Cornell academic integrity rules are enforced. Copying code from the Internet, fellow students or elsewhere is prohibited and will result in a minimum penalty of getting 0 points for the entire assignment.**

- **What and how to submit:**
  - Your code with a .py extension (submitting a single file for each question).
  - The results of all the questions in an MS Word or PDF file (some results may be presented as a screenshot).
  - Submit electronically to Blackboard with a single zipped file, containing your files above.

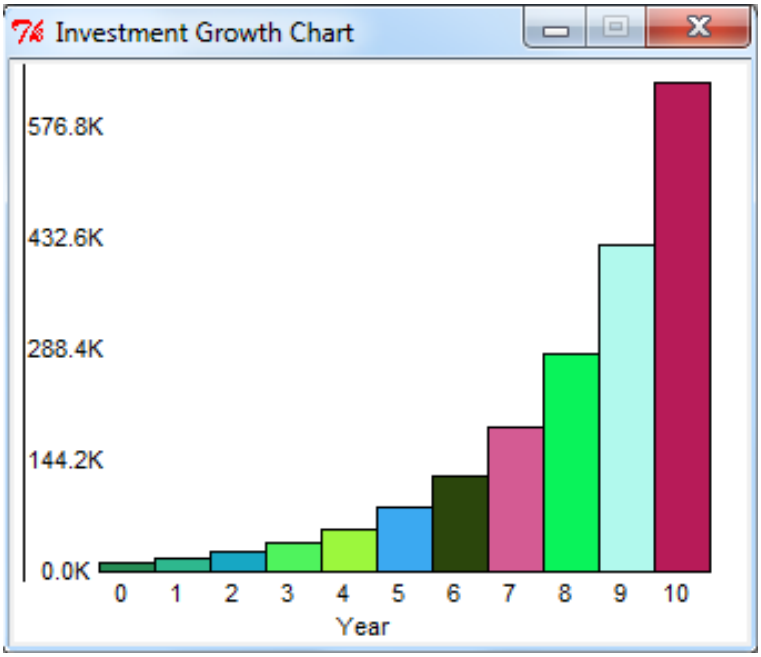
1. Modify the Python program given in the class to produce a scatter plot similar to what is shown below. The dataset (unequal.txt) to plot is provided. You have to show two similar screenshots (see examples below), but for the second one you use your own first and last names for the "Produced by …" label on the scatter plot. (20 points)





2. Modify the Python program given in the class to produce a bar chart similar to what is shown below to reflect the dollar value growth (for example, principle=$10000, APR=0.5). The following are the requirements:
    - Use the same graphic window size as specified in the class (330X260 pixels) but reset the coordinate system to normal orientation, i.e., the lower-left corner of graph window is (0, 0).
    - Scale the legends (or the labels) of the Y-axis with the total amount of the dollar value after 10 years that is determined by the values of the initial investment (or principal) and the APR input by the user through the keyboard. As a result, your graphic window will hold the whole bar chart no matter how the input values change and the contents of the legends (in thousands, represented by the letter "K"; keep one decimal point) are changed automatically based on your input values. The distance between the legends is 50 pixels.
    - Use one **for loop** to produce and place all the Y-axis legends.
    - Use one **for loop** to produce and place the X-axis legends, 0 through 10.
    - Use one **for loop** to produce the bars. The width of a bar is 25 pixels.
    - Randomly color the bars.

    (Hint: use the following formula to calculate the dollar amount after n years: principal*(1+apr)^{n}. Use the pow() method in the math module.) (55 points)



3. Write your Python program to achieve the functionality that you can convert temperature values from Fahrenheit to Celsius and vice versa. Your GUI design should look like the following. Both the text boxes can be used to input and output. Your buttons should work only when they are clicked on the yellow area. (25 points)