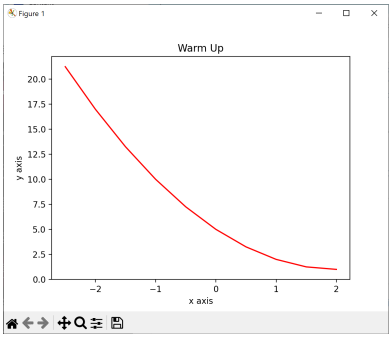
15-110 Refresher Session : Week 13

No Calculators, only Brains !!

1. **Warm up : Complete the code**
   A part of the python code that creates the graph below is provided to you. Your task is to complete the code.




```
import matplotlib.pyplot as plt

x = [i * 0.5 for i in range(-5, 5)]
y = [value**2 - 4 * value + 5 for value in x]
```

---

2. **Act like a Computer**
   For the following function, write the output in space provided

```
def mystery1():
    fileIn = open("example.txt")
    fileIn.readline()

    for i in range(1, 4) :
        data = fileIn.read(i)
        print(i, data)
    print(fileIn.readlines())
    data = fileIn.readline()
    print(data)
    fileIn.close()
```

3. **Act like a Computer**
For the following function, plot a graph. Comments are provided to aid your work:

```
def mystery():
    # Data generation
    data = [10, 15, 14, 10, 19, 22, 20, 18, 17, 15, 16, 18, 14, 13, 11, 19, 21, 25]

    # Plotting the histogram
    plt.hist(data, bins=5, color='skyblue', edgecolor='black')

    #Plotting the points
    a = 0
    b = 11.5
    for e in range(5):
        plt.plot(b, a, 'go')
        a += 1
        b += 3

    # Adding labels and title
    plt.xlabel("Value Range")
    plt.ylabel("Frequency")
    plt.title("Histogram of Data")

    # Display the plot
    plt.show()
```

4. **Act like a Programmer**

Your academic advisor has stored your semester grades in a CSV file with your name on it. For example, Sam's grades are stored in `sam.csv` (all lower case). A snapshot of the grades is shown below. The blank fields indicate that the midterms have not been held yet. Write a function `average(fileIn, fileOut)` that takes two string inputs `fileIn` and `fileOut` - the name of the csv file to read from, and the name of the text file to write to respectively. Your task is to write the name of the course and its total, as well as the average of all courses in CSV format. Each course data should be written on a separate line, with the course name and grade separated by a comma. Additionally, the last line should display the average performance, rounded to two decimal places. For instance, the output of the data provided is as follows

sam.csv | samgrades.txt | Week13_Refresher.py

```
course,midterm1,midterm2,midterm3
principles of computing,70,40,90
concepts of mathematics,79,89,90
english,95,83,5
physics,50,76,5
```

sam.csv | samgrades.txt | Week13_Refresher.py

```
principles of computing,200.0
concepts of mathematics,258.0
english,183.0
physics,131.0
Average,193.0
```