CPSC 217 Assignment 2

Due: Friday November 4, 2016 at 5:00pm
Weight: 7% of the overall grade

Individual Work

All assignments in this course are to be completed individually. Students are advised to read the guidelines for avoiding plagiarism located on the course website. Students are also advised that electronic tools may be used to detect plagiarism.

Late Penalty

Late assignments will not be accepted.

Questions and Marking

If you have any questions regarding this assignment, please ask your TA because it is your TA who will mark your assignment. In addition, your TA has full control over the assignment (i.e., they may have some specific requirements that your should follow).

Submission Instructions

Submit your Python program (a .py file) to Assignment 2 drop box on D2L.

Descriptions

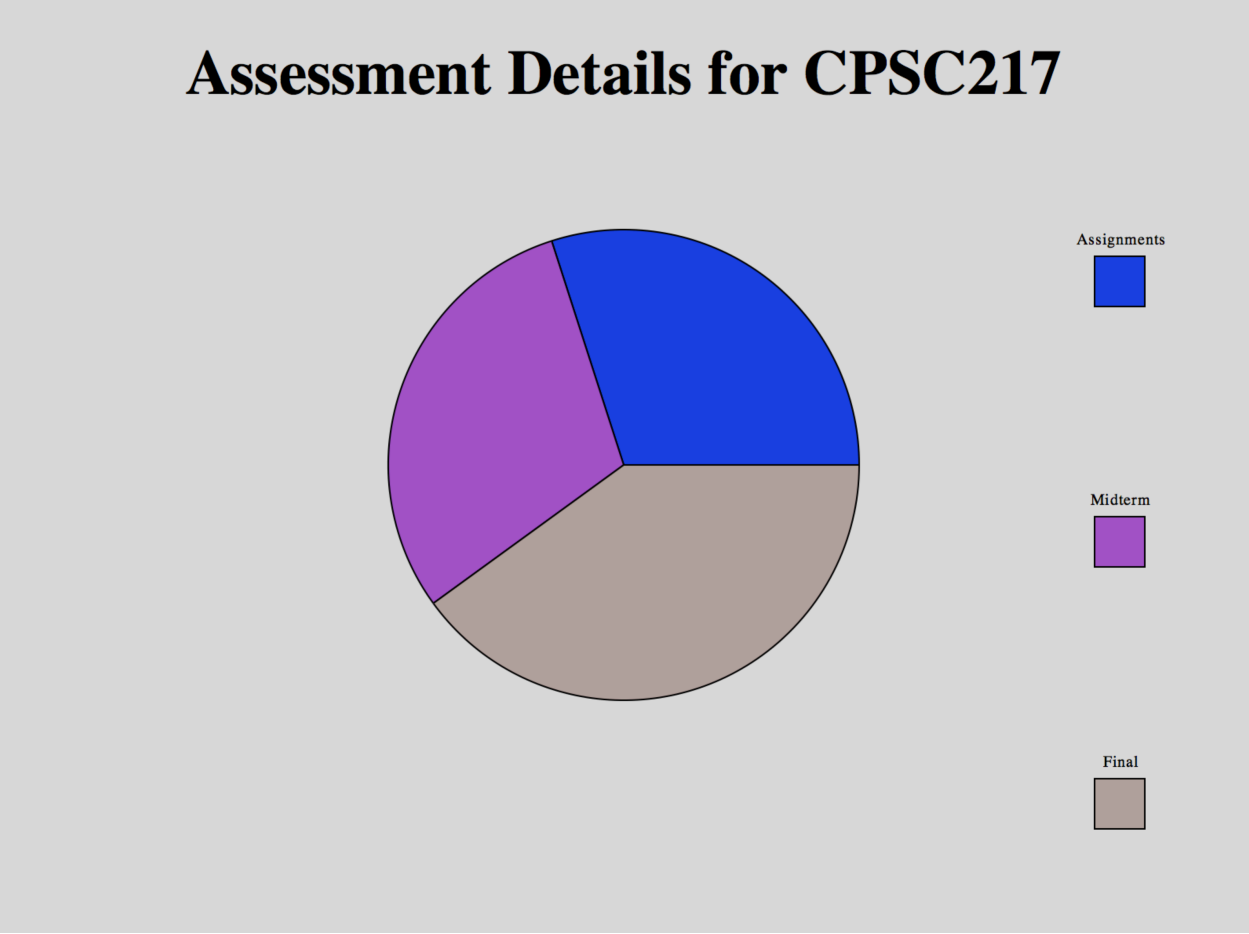
You will create a graphical Python program that will use the SimpleGraphics library to draw a chart specified by the user. Your program should present the user with a list of options (to pick between a pie chart and a bar chart) and then request the necessary data values from the user.

Pie Chart

For the pie chart you should start by asking the user for the title, the number of sectors, and the total sum of all the sector values. After this you will use a looping structure to ask the user for the name of each sector and the value for that sector and then you will use SimpleGraphics to draw a pieslice for that sector. Use a different colour for each sector and either build a legend that maps the name to the colour you used to draw the corresponding sector or write the name outside the chart, beside each sector. The pie chart should be centered in the window and should have a diameter of at least 300 units.

Included below is one possible example of such an interface. Below are the prompts presented to the user and the corresponding input (indicated in orange), as well as the resulting pie chart. Your program need not produce output that is identical to the example below – this has been included as a clarifying example only.

```
Chart Creation Menu
      1. Pie Chart
      2. Bar Chart
Select your chart type >> 1
Enter the title of the chart: Assessment Details for CPSC217
Enter the number of sectors: 3
Enter the total value of all sectors: 100
Label sector 1: Assignments
Enter the value of the Assignments sector: 30
Label sector 2: Midterm
Enter the value of the Midterm sector: 30
Label sector 3: Final
Your chart is completed.
```



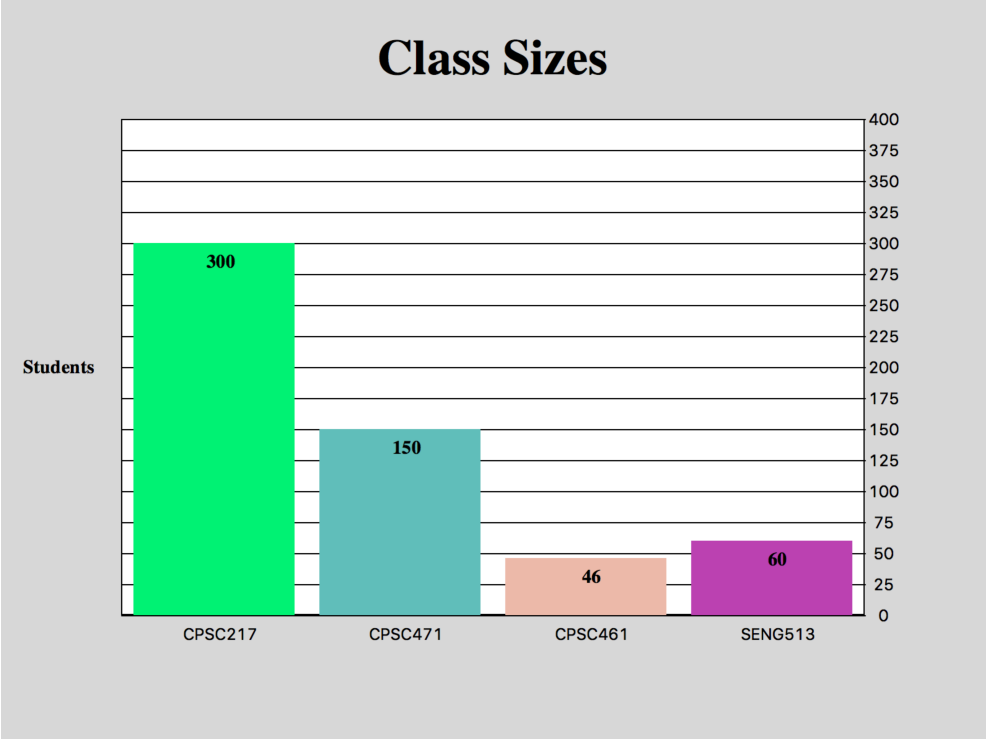
Bar Chart

For the bar chart you should again start by asking the user for the title, labels for the x and y axes, the number of categories, and the grid size. You may assume that the values associated with each category range between 0 and 400, or (if you wish to challenge yourself) you may compute the maximum and minimum values yourself in order to properly scale the axes of your chart. After this you will use a looping structure to ask the user for the name of each category and the value for that category and then you will use SimpleGraphics to draw a rectangular bar (either horizontally or vertically) for that category. Be sure to leave a gap between bars. Use a different colour for each category and write the name

outside the chart, beside each bar. The bar chart should occupy most of the window except for a margin of approximately 100 units. In other words, your chart should mostly cover the rectangle defined by rect(100, 100, 600, 400).

Included below is one possible example of such an interface. Below are the prompts presented to the user and the corresponding input (indicated in orange), as well as the resulting bar chart. Your program need not produce output that is identical to the example below – this has been included as a clarifying example only.

```
Chart Creation Menu
      1. Pie Chart
      2. Bar Chart
Select your chart type >> 2
Enter the title of the chart: Class Sizes
Enter the number of categories: 4
Enter the grid size (between 10 and 400): 25
Enter the label for the Y-Axis: Students
Label category 1: CPSC217
Enter the value of category CPSC217: 300
Label category 2: CPSC471
Enter the value of category CPSC471: 150
Label category 3: CPSC461
Enter the value of category CPSC461: 46
Label category 4: SENG513
Enter the value of category SENG513: 60
Your chart is completed.
```



Additional Specifications

- Your program must be able to draw a pie chart and a bar chart.
- When prompting for input, you must use available information given by the user (e.g., after user enter 'Midterm' as a sector, use 'Midterm' in the prompt for the value of Midterm)
- For the pie chart, users do not need to enter the last value of the last sector. The value should be calculated by your program (e.g., the total value is 100 and there are three sectors with the first two are 30 each, the last value should be 100 – 30 – 30 = 40)
- You can assume all user input is correct
- You can tell the users the maximum number of sectors (for pie charts) and categories (for bar charts) the program can accept. However, your program must be able to handle at least three sectors and three categories.
- You must not use 'break' or 'continue' statements in your program.
- Your program must include appropriate comments, including a header that includes your name and student number and describes the purpose of your program. There should also be comments within the program.

Grading

This assignment will be graded on a combination of functionality and style. A base grade will be determined from the general level of functionality of the program (e.g., Does it draw the charts correctly? Does it meet all the specifications?) The base grade will be recorded as a **mark out of 14**.

Style will be marked on a subtractive scale from 0 to -3. For example, an assignment that receives a base mark of 12, but has several stylistic problems such as improper use of functions or insufficient comments resulting in a -2 adjustment will receive an overall mark of 10.