Lab 5: Decision Structures – Debugging and Flowchart

Before you begin, download the two supporting files provided on Canvas. Click on the icon to the right of each file and choose Download.

In your project folder, create a new folder named **Lab5** and move the files you downloaded into this folder. Because this is a multi-file assignment, you will later compress (zip) this folder to submit your work.

Once you are ready, follow the instructions for each part to complete this lab.

Part 1: Correcting Code

1. In IDLE, open the file named **lab5Part1.py**. Add your name as the author and the assignment due date.
2. This program prompts the user for a number between 0 and 100, determines the letter grade based on the input, and then displays the letter grade to the screen.
3. There are two syntax errors and one logic error in the code. When you identify an error, add an end-line comment to the file explaining the error, and then correct it. ***ONLY*** correct the errors in the file, do **NOT** rewrite the code!
4. The program is corrected when the output matches the example output below.
5. Once you are done, rename the file as **lab5*yourlastname*Part1.py** (For example: lab5DavisonPart1.py), and move to Part 2.

```
Enter your grade (0-100): 85
Your letter grade is a B.
```

```
Enter your grade (0-100): 98
Your letter grade is an A!
```

```
Enter your grade (0-100): 65
Your letter grade is an F.
```

```
Enter your grade (0-100): 78
Your letter grade is a C.
```

Part 2: Create a Program

1. In IDLE, open the file named **lab5Part2.py**. Add your name as the author and the assignment due date. Follow the steps below and the guidance from the comments in the file.
2. This program will create a discount calculator that determines if the user has purchased enough items or spent enough money to qualify for a 20% or 10% discount on their purchase.
3. Prompt the user for a subtotal and item quantity. You will need to convert these inputs to a **float** and **int** respectively.
4. Use an if-elif-else decision structure to determine the following:
    a. If the user purchased 50 or more items or the subtotal is $100 or more, set the discount to 20 percent of the subtotal and display, “You qualify for a 20% discount!”
    b. Else, if the user purchased 15 or more items or the subtotal is $50 or more, set the discount to 10 percent of the subtotal and display, “You qualify for a 10% discount!”
    c. Otherwise, set the discount to 0 and display, “You do not qualify for a discount.”

5. Assuming the overall sales tax rate is 7 percent. Set a new variable for the sales tax that is the difference of the subtotal minus the discount, multiplied by the sales tax rate. *Hint: Remember that 7 percent would be a decimal value of 0.07.*
6. Set a new variable for the sale total that is the subtotal plus the sales tax and minus the discount.
7. Display the subtotal, discount, sales tax, and total values to the user. Use the output image below as a reference. Your output should be formatted the same as the example outputs. *Hint: You will need to format the output using f-strings to display currency format, comma separators, and tab characters.*
8. Once you are done, rename the file as **lab5*yourlastname*Part2.py** (For example: lab5DavisonPart2.py), and move to Part 3.

```
Enter the subtotal: 102.10
Enter the quantity: 23
You qualify for a 20% discount!
Subtotal:   $102.10
Discount:   $20.42
Sales tax:  $5.72
Total:      $87.40
```

```
Enter the subtotal: 44.50
Enter the quantity: 12
You do not qualify for a discount.
Subtotal:   $44.50
Discount:   $0.00
Sales tax:  $3.12
Total:      $47.62
```

```
Enter the subtotal: 50.00
Enter the quantity: 32
You qualify for a 10% discount!
Subtotal:   $50.00
Discount:   $5.00
Sales tax:  $3.15
Total:      $48.15
```

Part 3: Flowchart

1. Go to Drawio and click Start. Create a new diagram from the Blank Diagram template and click Create. *Note: The Blank Diagram template is the default option.*
2. Include a textbox from the General group of shapes, third option. Add your name and date to the textbox. Resize the textbox appropriately and move it to the top-left of your page.
3. Use the instructions and program from Part 2 to create a flowchart that matches the expected flow of events. You **must** use the correct symbols in your diagram.
4. When you are finished creating your flowchart, click File, Export as, and choose PNG. Use a border width of **50** and select **Light** for Appearance. Download the image file and rename as **lab5*yourlastname*Part3.png** (For example: lab5DavisonPart3.png).
5. Once you are done, save and close all files. Compress (zip) the **three** files, rename your zip folder **lab5*yourlastname*.zip**. Then, submit the zipped folder on Canvas as an attachment to Lab 5.