CP1850 – Assignment 1

Handed Out: 25 Sep 2023
Due Date: 10 Oct 2023

Objectives

This problem set will introduce you to the programming environment Spyder from the Anaconda Distribution of Python, and to programming in Python, as well as the general assignment structure. In this assignment, you will confirm your installation of Python, write a bunch of simple Python programs, and submit the same.

Collaboration

You may work with other students. However, each student should write up and hand in his or her assignment separately. Be sure to indicate with whom you have worked in the comments of your submission.

Submission

You will create one python file for each question. You need to ensure that suitable comments are present in the code. Please ensure you submit your assignment to the drop box that is provided on Brightspace **before the due date**.

Late submissions

Penalties for late submissions is as follows:

- Up to 24 hours after the due date: Flat 25% penalty
- Beyond 24 hours up to 48 hours: Flat 50% penalty
- Beyond 48 hours: No points for assignment

If for some reason you are unable to submit the assignment on time, please reach out to me to make alternate arrangements – which will be handled based on the merits of the case. **No extensions will be provided.** Please ensure you stay on top of the requirements and manage your time well.

Problem 01

Create a program that converts number grades to letter grades.

Console

```
Letter Grade Converter

Enter numerical grade: 90
Letter grade: A

Continue? (y/n): y

Enter numerical grade: 88
Letter grade: A

Continue? (y/n): y

Enter numerical grade: 80
Letter grade: B

Continue? (y/n): y

Enter numerical grade: 67
Letter grade: C

Continue? (y/n): y

Enter numerical grade: 59
Letter grade: F

Continue? (y/n): n

Bye!
```

Specifications

- The grading criteria is as follows:

```
A    88-100
B    80-87
C    67-79
D    60-66
F    <60
```

- Assume that the user will enter valid integers for the grades.
- The program should continue only if the user enters “y” or “Y” to continue.

Problem 02

Create a program that calculates three options for an appropriate tip to leave after a meal at a restaurant.

Console

```
Tip Calculator

Cost of meal: 52.31

15%
Tip amount:   7.85
Total amount: 60.16

20%
Tip amount:   10.46
Total amount: 62.77

25%
Tip amount:   13.08
Total amount: 65.39
```

Specifications

- The program should calculate and display the cost of tipping at 15%, 20%, or 25%.
- Assume the user will enter valid data.
- The program should round results to a maximum of two decimal places.

Problem 03

Create a program that calculates the coins needed to make change for the specified number of cents.

Console

```
Change Calculator

Enter number of cents (0-99): 99

Quarters: 3
Dimes:    2
Nickels:  0
Pennies:  4

Continue? (y/n): y

Enter number of cents (0-99): 55

Quarters: 2
Dimes:    0
Nickels:  1
Pennies:  0

Continue? (y/n): n

Bye!
```

Specifications

- The program should display the minimum number of quarters, dimes, nickels, and pennies that one needs to make up the specified number of cents.
- Assume that the user will enter a valid integer for the number of cents.
- The program should continue only if the user enters “y” or “Y” to continue.

Problem 04

Create a program that calculates the total cost of an order including shipping.

Console

```
================================================================
Shipping Calculator
================================================================
Cost of items ordered:  49.99
Shipping cost:          7.95
Total cost:             57.94

Continue? (y/n): y
================================================================
Cost of items ordered:  -65.50
You must enter a positive number. Please try again.
Cost of items ordered:  65.50
Shipping cost:          9.95
Total cost:             75.45

Continue? (y/n): n
================================================================
Bye!
```

Specifications

- Use the following table to calculate shipping cost:

COST OF ITEMS	SHIPPING COST
< 30.00	5.95
30.00-49.99	7.95
50.00-74.99	9.95
>= 75.00	FREE

- If the user enters a number that's less than zero, display an error message and give the user a chance to enter the number again.

Problem 05

Create a program that displays a table of squares and cubes for the specified range of numbers.

Console

```
Table of Powers

Start number: 90
Stop number:  100

Number     Squared       Cubed
======     =======       =====
90         8100          729000
91         8281          753571
92         8464          778688
93         8649          804357
94         8836          830584
95         9025          857375
96         9216          884736
97         9409          912673
98         9604          941192
99         9801          970299
100        10000         1000000
```

Specifications

- The formulas for calculating squares and cubes are:

```
square = x ** 2
cube = x ** 3
```

- Use tabs to align the columns.
- Assume that the user will enter valid integers.
- Make sure the user enters a start integer that's less than the stop integer. If the user enters a start integer that's greater than the stop integer, display an error message and give the user a chance to enter the integers again.