Lab Task 1

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Q1) Write a program that takes as input any change expressed in cents. It should then compute the number of half-dollars, quarters, dimes, nickels, and pennies to be returned, using as many half-dollars as possible, then quarters, dimes, nickels, and pennies, in that order. For example, 483 cents would be returned as 9 half-dollars, 1 quarter, 1 nickel, and 3 pennies.

Input: Change in cents
Output: Equivalent change in half-dollars, quarters, dimes, nickels, and pennies

Suppose the given change is 646 cents. To find the number of half-dollars, you divide 646 by 50, the value of a half-dollar, and find the quotient, which is 12, and the remainder, which is 46. The quotient, 12, is the number of half-dollars, and the remainder, 46, is the remaining change. Next, divide the remaining change by 25, to find the number of quarters. The remaining change is 46, so division by 25 gives the quotient 1, which is the number of quarters, and a remainder of 21, which is the remaining change. This process continues for dimes
(10) , nickels (5) and pennies(1)

Sample Input : 483

```
Equivalent change in half-dollars, quarters, dimes, nickels, and pennies:
9 half-dollars, 1 quarter, 1 nickel, and 3 pennies.
```

Sample Input : 646

```
Equivalent change in half-dollars, quarters, dimes, nickels, and pennies:
12 half-dollars, 1 quarter, 2 dimes, 0 nickels, and 1 penny.
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Q2) Imagine the user enters an Input that looks like below. Design an algorithm and code to count the alphabets, digits, chars and also the space.

Input: Sa uik, I pwd seeieo 236667. GH kiu: sieo?? 45.79

Output: Alphabets: 24 , space: 9 , Digits: 10 , other: 6

Q3) Write a java program to print the following series

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1 2 3 4 5 4 3 2 1
2 3 4 5 4 3 2
3 4 5 4 3
4 5 4
5
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Q4) Using class, design a concept for Book in a library. Some of the characteristics of a book are the title, author(s), publisher, ISBN, price, and year of publication. (6)

Each object of the class Book can hold the following information about a book: title (up to three authors), publisher name, ISBN Number, price, year of publication, and number of copies in stock.

Include the methods to perform various operations on the objects of Book. For example, the usual operations that can be performed on the title are to show the title, set the title, and check whether a title is the actual title of the book.

Similarly, the typical operations that can be performed on the number of copies in stock are to show the number of copies in stock, set the number of copies in stock, update the number of copies in stock, and return the number of copies in stock.

Q5) Consider a class hierarchy for vehicles, with a base class Vehicle and two derived classes Car and Motorcycle.

- Implement a constructor in the Vehicle class to initialize common attributes like make, model, and year. Include the necessary parameters in the constructor.
- Overload a method drive() in the Vehicle class to handle different driving conditions. The method should accept parameters for a generic driving scenario (no specific parameters), highway driving (speed parameter), and off-road driving (terrain type parameter).
- Override the drive() method in both the Car and Motorcycle classes to provide specific implementations for driving a car and a motorcycle, respectively. Include parameters specific to each type of vehicle.
- Create instances of the Car and Motorcycle classes using the constructor and demonstrate the use of both the overloaded and overridden drive() methods.