Assignment 1

(Question 1)

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1. Which feature of OOP illustrated the code reusability? Explain with examples
   Inheritance is a feature that illustrates code reusability because, in inheritance, a class inherits properties and methods of an existing well-written class, so the programmer doesn't need to create those variables and methods again.
   Example: In a university, there are **teachers** and **students**. Some of the common attributes both contain are name, id, email, contact number, age, etc. There will be some common methods for both of them too such as login(), setName(), setID() and etc. So instead of creating two separate classes with the same attributes and methods, we can create a class that will contain attributes and methods common in both student and teacher. In this example, that class can be called **Person**. So, student and teachers will inherit from **Person** class. This will remove duplication and allow us code reusability.

2. What is the difference between encapsulation and Abstraction? Explain with a real-time example

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Encapsulation	Abstraction
Encapsulation refers to bundling data and methods that operate on that data into a single unit. It also refers to restricting direct access to some of the data.	Abstraction refers to showing only necessary information about the data to the outside world and hiding its background details and implementation. It also means showing only those information which is relevant to current perspective
Encapsulation is used for data hiding	Abstraction is used for implementation hiding
Real Life Example: Email server is one of the example. When we log into email accounts, there is a lot of internal process in the background that we have to control over it. So when we enter the password, it is encrypted and verified but we have no access to these processes. This way, our account is kept safe.	**Real Life Example:** A car has different perspectives. For a normal driver, we are concerned about driving the car, accelerating and braking. We are not concerned about the mechanism of acceleration or changing the gear. However, for engineer perspective, we need to know structure, engine workings, and all the technical mechanism of the car