Assignment-4

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1. Explain Inheritance and polymorphism from OOP's concept with Example.

Inheritance and polymorphism are two fundamentd concepts in object-oriented Programming (OOP). Both concepts facilitate code reuse and enhance the flexiability and extensibility of software. To Understand these concepts from a Loops perspective Let; use the analogy to explain each one:

* Inheritance:

Inheritance is a concept of oop where one class can inherit properties and behaviours from another class. The subclass can extend the functionality of the superclass by adding new features (or) overriding existing ones

Loop Analogy: Thinking of inheritance as a Looping mechanism where you start with a basic Loop and the use it as a template to create additional sepecialized Loops

Example: The "shape" clan is the base class and the "Rectangle" and "Circle" classes are derived class. The "shape" class provide a generic method "area()" and each derived class implement its own venion of the area() method, which Calcurate the area of the specific shape. By inheriting from the "shape" class, the Rectangle and "circle" classes resuse the common behavior while adding their specific implementation

* Polymorphism:

Polymorphism is the ability of objects to take on multiple forms. In the content of OOP, it allows differed classes to have method with same name, but the behaviour can vary depending on the actual object type (run time)

Loop Analogy: Think of polymorphism or a looping mechanism that iterate over a list of differet objects, treating each other object uniformly even touge may belong to differt class.

Example: The 'print-area' function take a 'sharp' object of an argument. It doesn't know about the specific type of shape, it only knows that all shapes have 'area' method. This polymorphism in action - treating objects. when the loop iterate over the list of shapes the appropriate 'area' method of each shape is involved, demonstrating polymorphic behaviour.