Hyacinth Chibueze Okoro: Inheritance.

**What is Inheritance?** Programmers or coders work with classes or blocks of codes which have different attributes and methods. Like I got some attributes from my parents, a class can get or obtain the attributes and method of another class without having to type them; this is referred to as Inheritance. The class that inherits the properties and methods from another class is called a derived or child class while the class whose attributes and methods are inherited is called a base or parent class.

**Benefits of Inheritance**: One of the key benefits of inheritance is the fact that it makes a code reusability and maintainability very easy and possible. When shared attributes or functionalities are placed in a base class, we can avoid duplicating code across multiple derived classes. If an error is found or an update is needed in the shared behavior, we only need to update the base class, and all derived classes automatically inherit the change. This reduces maintenance overhead and the risk of errors from inconsistent updates across duplicated codes.

**Application of Inheritance**: Inheritance is widely used in software design to model real-world relationships and streamline development. A common application is in user interface programs. For example, in a GUI library, a base class “Control” may define common properties like position, size, and visibility, along with methods like Draw() or HandleClick(). Classes like TextBox, or Label inherit from Control to reuse these properties and methods while adding specific behaviors. This allows developers to create a variety of UI elements with shared functionality without having to write and rewrite codes.

In the activity program “Math Assignment”, the main or parent class “assignment” needed to store some attributes such as the student's name and the topic. The assignment had a constructor that required a value for each of the items that it stored. The other class “math assignment” also needed to store attributes like student’s name and topic among other attributes. Consider the code below:

public class Assignment

{

    private string \_studentName;

    private string \_topic;

    public Assignment(string studentName, string topic)

    {

        \_studentName = studentName;

        \_topic = topic;

    }

    public string GetStudentName()

    {

        return \_studentName;

    }

    public string GetTopic()

    {

        return \_topic;

    }

public class MathAssignment : Assignment

{

    private string \_textbookSection;

    private string \_problems;

    public MathAssignment(string studentName, string topic, string textbookSection, string problems)

        : base(studentName, topic)

    {

        \_textbookSection = textbookSection;

        \_problems = problems;

    }

Since the **\_studentName** and **\_topic** attributes are the same in both classes, Instead of duplicating these items, we can placed them in a base class “assignment” that they both inherited from.