What is inheritance and why is it important?

Your response must:

* Explain the meaning of Inheritance.
* Highlight a benefit of Inheritance.
* Provide an application of Inheritance.
* Use a code example of Inheritance from the program you wrote. (You should copy and paste a few lines of code that demonstrate the use of the principle.)
* Thoroughly explain these concepts. (This likely cannot be done in less than 100 words.)

Inheritance is a fundamental principle in object-oriented programming that allows one class to acquire the properties and behaviors of another. In C#, this is done by creating a base class with shared functionality, and then having other classes derive from it. This approach promotes code reuse, reduces duplication, and makes programs easier to maintain and extend.

One major benefit of inheritance is that it centralizes shared logic. For example, if multiple classes need to display a starting message or show a countdown, we can define those methods once in the base class and reuse them across all derived classes. This way, if we need to fix a bug or improve the behavior, we only have to update it in one place.

In my Mindfulness Program, I implemented inheritance by creating a base class called Activity, which contains common attributes like \_name, \_description, and \_duration, as well as shared methods like DisplayStartingMessage() and ShowSpinner(). Then I created three specific activity classes — BreathingActivity, ReflectingActivity, and ListingActivity —that inherit from Activity and implement their own unique Run() methods.

Here’s a code example from my program that demonstrates inheritance:

public class BreathingActivity : Activity

{

public BreathingActivity() : base("Breathing", "This activity will help you relax by walking you through breathing in and out slowly. Clear your mind and focus on your breathing.")

{

}

public void Run()

{

DisplayStartingMessage();

// Activity-specific logic here...

DisplayEndingMessage();

}

}

In this example, BreathingActivity inherits from Activity and uses the shared methods DisplayStartingMessage and DisplayEndingMessage without redefining them. This shows how inheritance helps organize code logically, keeps it clean, and makes it easier to scale.