What is encapsulation and why is it important?

Your response must:

* Explain the meaning of Encapsulation.
* Highlight a benefit of Encapsulation.
* Provide an application of Encapsulation.
* Use a code example of Encapsulation 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.)

**Encapsulation** is an object-oriented programming principle that involves **hiding the internal state and implementation details of a class** while exposing only the necessary functionality through public methods. This ensures that the internal data is protected from unintended access or modification, improving maintainability and reducing bugs.

A key **benefit** of encapsulation is that the internal implementation of a class can change without affecting other parts of the program, as long as the public interface remains consistent.

In our Scripture Memorizer Program, encapsulation is applied in the Word class. Each word manages its own state, such as whether it is hidden or visible. The Scripture class interacts with Word objects only through public methods, without needing to know the internal logic.

**Code example:**

public class Word

{

private string \_text;

private bool \_isHidden;

public Word(string text)

{

\_text = text;

\_isHidden = false;

}

public void Hide()

{

\_isHidden = true;

}

public string GetDisplayText()

{

return \_isHidden ? new string('\_', \_text.Length) : \_text;

}

}

Here, \_isHidden is private and protected from external access. Other classes, like Scripture, use only Hide() and GetDisplayText(), which **encapsulate the word’s internal behavior**. This makes the program safer, more modular, and easier to maintain.