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**Topic 8 - Concatenating Text Strings**

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**Introduction**

In Python, concatenation allows you to combine multiple strings into one. This can be useful when building dynamic text, such as personalized messages or complex output statements. In this lesson, we’ll learn how to concatenate strings and variables in Python and explore ways to handle different types of concatenation.

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**What is Concatenation?**

Concatenation is the process of joining two or more strings together using the + operator. You can concatenate strings directly, concatenate string variables, or mix both.

**Example of Concatenation:**

*greeting = "Hello"*

*addressee = "World"*

*whole\_greeting = greeting + addressee*

*print(whole\_greeting) # Output: HelloWorld*

In this example, greeting and addressee are combined without a space, resulting in HelloWorld.

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**Why Use Concatenation?**

Concatenation is helpful for:

* **Building Flexible Output**: You can create personalized messages or dynamically generated text.
* **Improving Readability**: Breaking complex text into parts can make code more readable and modular.
* **Combining Variables and Strings**: You can combine variables holding strings with literal text strings to display meaningful messages.

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**How to Concatenate Strings in Python**

1. **Concatenating Variables**  
   You can concatenate two or more variables containing strings using the + operator:

*greeting = "Hello"*

*addressee = "World"*

*whole\_greeting = greeting + ", " + addressee + "!"*

*print(whole\_greeting) # Output: Hello, World!*

1. **Concatenating Directly**  
   You can also concatenate strings directly without using variables:

*print("Hello, " + "World!") # Output: Hello, World!*

1. **Mixing Variables and Strings**  
   You can combine strings and variables in concatenation:

*punc = "!"*

*print("Hello" + ", " + "World" + punc) # Output: Hello, World!*

1. **Concatenation Rules**
   * Python allows the + operator to concatenate strings and variables that contain strings.
   * **Combining Strings and Numbers**: To avoid errors, you cannot directly concatenate strings and numbers. You must convert numbers to strings first:

*print("The sum of 2 plus 2 is " + “4”) # Output: The sum of 2 plus 2 is 4*

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**Conclusion**

Concatenation in Python is a powerful tool for creating complex text output by combining strings and variables. By using the + operator, we can construct dynamic messages, improve readability, and avoid ambiguity in our code. Understanding concatenation is essential for efficient and flexible string handling in Python.