**Positional & Default Arguments in Python**

In Python, function arguments can be categorized into **positional arguments** and **default arguments**.

**1. Positional Arguments**

These are arguments that **must be provided in the correct order** when calling a function.

**Example:**

def greet(name, age):

print(f"Hello, my name is {name} and I am {age} years old.")

# Calling the function with positional arguments

greet("Alice", 25)

**Output:**

Hello, my name is Alice and I am 25 years old.

**Key Points:**

* The values **"Alice"** and **25** are assigned to name and age based on their position.
* Order matters: greet(25, "Alice") would result in incorrect behavior.

**2. Default Arguments**

These are arguments that **have default values** and are **optional when calling the function**.

**Example:**

def greet(name, age=30):

print(f"Hello, my name is {name} and I am {age} years old.")

# Calling the function with both arguments

greet("Bob", 40) # Overrides default age

# Calling the function with only the required argument

greet("Charlie") # Uses default age

**Output:**

Hello, my name is Bob and I am 40 years old.

Hello, my name is Charlie and I am 30 years old.

**Key Points:**

* age has a default value of 30, so calling greet("Charlie") works without explicitly passing an age.
* If an argument with a default value is provided, it overrides the default.

**Mixing Positional and Default Arguments**

* **Positional arguments must always come before default arguments**.

✅ **Valid:**

def greet(name, age=25):

print(f"Hello, {name}. You are {age} years old.")

❌ **Invalid (will cause an error):**

def greet(name="John", age): # Error! Default argument before a required argument

print(f"Hello, {name}. You are {age} years old.")

**Error:**

SyntaxError: non-default argument follows default argument

**Summary**

| **Argument Type** | **Definition** | **Example** |
| --- | --- | --- |
| **Positional** | Arguments passed in order | func("Alice", 25) |
| **Default** | Arguments with preset values | func("Bob"), where age defaults to 30 |