**🎯 Topic: Python Scope & Variable Lifetime (LEGB Rule)**

### **✅ First: What is "Scope"?**

A **scope** defines **where a variable can be accessed** in your code.

📦 Think of it like **rooms inside a big mall (Amazon App)**:

* Some items are only available inside a shop (function)
* Some items are available on the whole floor (module/global)

## **🔁 LEGB Rule = The 4 Levels of Scope in Python**

When Python sees a variable, it searches in this order:  
 **L → E → G → B**

### **✅ 1. L = Local (Inside a function)**

🔸 Variables defined inside a function.

### **🧑‍🍳 Real-Life Analogy (Zomato):**

You order food inside a restaurant.  
 The waiter knows your **table number** (local to the restaurant only).

### **🧑‍💻 Example:**

def order():

food = "Burger" # Local variable

print("You ordered:", food)

order()

# print(food) ❌ Error! food is local

✅ You **can’t access** food outside the order() function.

### **✅ 2. E = Enclosing (Nested Functions)**

🔸 Variable defined in an outer function but used in an inner function.

### **🛒 Real-Life Analogy (Flipkart):**

You’re in a specific **department inside a mall**.  
 The inner section can access department rules (enclosing), but not the whole mall.

### **🧑‍💻 Example:**

def cart():

discount = 10 # Enclosing

def checkout():

print("Applying discount:", discount)

checkout()

cart()

✅ checkout() has access to discount, even though it’s not defined inside it.

### **✅ 3. G = Global (Top-level in the file)**

🔸 Variable defined at the top of your Python file — available to all functions.

### **📦 Real-Life Analogy (Amazon):**

You log in once — your **user\_id** is available to **all pages** in the app.

### **🧑‍💻 Example:**

user\_id = "Gowtham123" # Global

def homepage():

print("Welcome,", user\_id)

def profile():

print("Profile for:", user\_id)

homepage()

profile()

✅ user\_id is available everywhere in the file.

### **✅ 4. B = Built-in (Default Python keywords & functions)**

🔸 These are variables/functions **already defined by Python**.

### **📦 Real-Life Analogy (Swiggy):**

The app already has built-in **features** like maps, payment gateway, etc. — you didn’t code it, but you can use it.

### **🧑‍💻 Example:**

print(len("Zomato")) # len is a built-in function

✅ You didn’t define len, but Python knows it.

## **🧠 Python Searches Variables in This Order:**

L → E → G → B

Local → Enclosing → Global → Built-in

If it doesn’t find the variable in **L**, it looks in **E**, then **G**, then **B**.  
 If it still doesn’t find it — ❌ **NameError**

## **🧪 Real-Time Mini Use Case: Zomato Order Flow**

delivery\_partner = "Swiggy Genie" # Global

def restaurant():

item = "Pizza" # Enclosing

def order\_now():

quantity = 2 # Local

print(f"Ordering {quantity} {item} using {delivery\_partner}")

order\_now()

restaurant()

🖨 Output:

Ordering 2 Pizza using Swiggy Genie

✅ All three scopes used:

* quantity → Local
* item → Enclosing
* delivery\_partner → Global

## **🔥 Summary Table**

| **Scope** | **Level** | **Example Name** | **Access** |
| --- | --- | --- | --- |
| **Local** | Inside function | quantity | Only inside that function |
| **Enclosing** | Outer function | item | Inner functions can access |
| **Global** | Top of file | user\_id, partner | All functions in file can access |
| **Built-in** | Python default | len(), print() | Always available |

Want me to turn this into:

* 📽 Video script with storytelling?
* 📊 Slide format with real-time visuals?
* 🧪 A small **LEGB-based coding challenge**?

### **👉 What are built-in variables in Python?**

## **✅ Built-in Variables in Python (B in LEGB)**

These are **predefined variables** and constants that **exist in Python’s global namespace** without you creating them.

They are always available — you don’t need to import or define them.

### **🧠 Some examples of built-in variables:**

| **Name** | **Purpose** |
| --- | --- |
| \_\_name\_\_ | Tells if the script is run directly or imported |
| \_\_file\_\_ | Path of the current Python file |
| \_\_doc\_\_ | Returns the docstring of a module/function |
| \_\_builtins\_\_ | Contains all built-in functions/objects |
| True, False | Boolean constants (yes, these are vars!) |
| None | Special built-in value (no value) |
| Ellipsis | ... object (used in slicing or as placeholder) |

### **✅ Example 1: Using \_\_name\_\_ (most common)**

print(\_\_name\_\_) # Output: "\_\_main\_\_" when run directly

### **✅ Example 2: Checking all built-in names**

print(dir(\_\_builtins\_\_))

🧠 This shows a list of all built-in:

* functions like print(), len()
* variables like True, False, None

## **🧠 Recap for LEGB (Built-in Scope):**

| **Type** | **Is It Built-in?** | **Example** |
| --- | --- | --- |
| Function | ✅ Yes | len(), print() |
| Constant Variable | ✅ Yes | True, False, None |
| Special Variable | ✅ Yes | \_\_name\_\_, \_\_doc\_\_ |

### **About the Author**

**Gowtham SB** is a **Data Engineering expert, educator,** **and content creator** with a passion for **big data technologies, as well as cloud and Gen AI** . With years of experience in the field, he has worked extensively with **cloud platforms, distributed systems, and data pipelines**, helping professionals and aspiring engineers master the art of data engineering.

Beyond his technical expertise, Gowtham is a **renowned mentor and speaker**, sharing his insights through engaging content on **YouTube and LinkedIn**. He has built one of the **largest Tamil Data Engineering communities**, guiding thousands of learners to excel in their careers.

Through his deep industry knowledge and hands-on approach, Gowtham continues to **bridge the gap between learning and real-world implementation**, empowering individuals to build **scalable, high-performance data solutions**.

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