**Lesson 2: Syntax and Your First App**

**🔹 Introduction**

In this lesson, we’re going to dive into the core of Python’s syntax and build your first Python application!

By the end of this lesson, you’ll:

* Understand how to write and run Python code.
* Learn about the basic syntax rules of Python.
* Create a simple application using variables, input/output, and basic logic.

**🔹 Python Syntax: A Quick Overview**

Python syntax is known for being clean and easy to read. Let’s break down the basic rules:

1. Case SensitivityPython is case-sensitive, meaning that myvariable and MyVariable are different variables.
2. IndentationUnlike many other programming languages that use braces {} to define blocks of code, Python uses indentation (spaces or tabs). Indentation helps define which lines of code belong to loops, functions, and classes.

* Example:

if True:

print("Hello, Python!")

1. Comments

Comments in Python are created by using the # symbol. Python ignores anything after the # on a line.

# This is a comment

print("Hello, World!") # This prints text

1. Variables and Data types

Python is dynamically typed, meaning you don’t have to explicitly declare a variable type. Python automatically detects it.

my\_number = 10 # Integer

my\_name = "John" # String

my\_pi = 3.14 # Float

1. Print Statement

Use print() to display output in Python.

print("Hello, World!")

1. Basic Operators

Python supports all the basic arithmetic operators:

* + + (addition)
  + - (subtraction)
  + \* (multiplication)
  + / (division)
  + % (modulo)

**🔹 Building Your First Python App: A Simple Calculator**

Now that we understand the basic syntax, let’s build a simple calculator app that can add, subtract, multiply, and divide numbers based on user input.

print("Welcome to the Simple Calculator App!")

# Take user input for the two numbers

num1 = float(input("Enter the first number: "))

num2 = float(input("Enter the second number: "))

# Display operation choices

print("\nSelect operation:")

print("1. Add")

print("2. Subtract")

print("3. Multiply")

print("4. Divide")

# Take the user's choice

operation = input("\nEnter the operation (1/2/3/4): ")

# Perform the operation

if operation == '1':

result = num1 + num2

print(f"\n{num1} + {num2} = {result}")

elif operation == '2':

result = num1 - num2

print(f"\n{num1} - {num2} = {result}")

elif operation == '3':

result = num1 \* num2

print(f"\n{num1} \* {num2} = {result}")

elif operation == '4':

if num2 != 0:

result = num1 / num2

print(f"\n{num1} / {num2} = {result}")

else:

print("\nError! Division by zero is not allowed.")

else:

print("\nInvalid Input! Please select a valid operation.")

**🔹 Breaking Down the Code**

* Input: We use the input() function to get input from the user. The user enters two numbers, and we use float() to ensure they can enter decimal values.
* Conditionals: Using if, elif, and else, we determine which operation to perform based on the user's choice.
* Error Handling: We also include a check for division by zero, which is handled gracefully by an if condition.

**🔹 Running the App**

When you run the above code, the app will ask the user to input two numbers and select an operation (addition, subtraction, multiplication, or division). Based on the operation, it will calculate and display the result

Welcome to the Simple Calculator App!

Enter the first number: 12

Enter the second number: 4

Select operation:

1. Add

2. Subtract

3. Multiply

4. Divide

Enter the operation (1/2/3/4): 4

12.0 / 4.0 = 3.0

**🔹 Outro**

Congratulations! In this lesson, you’ve:

* Learned the basic Python syntax: variables, operators, and functions.
* Built your first Python app — a simple calculator.
* Got hands-on experience with taking user input and performing operations.