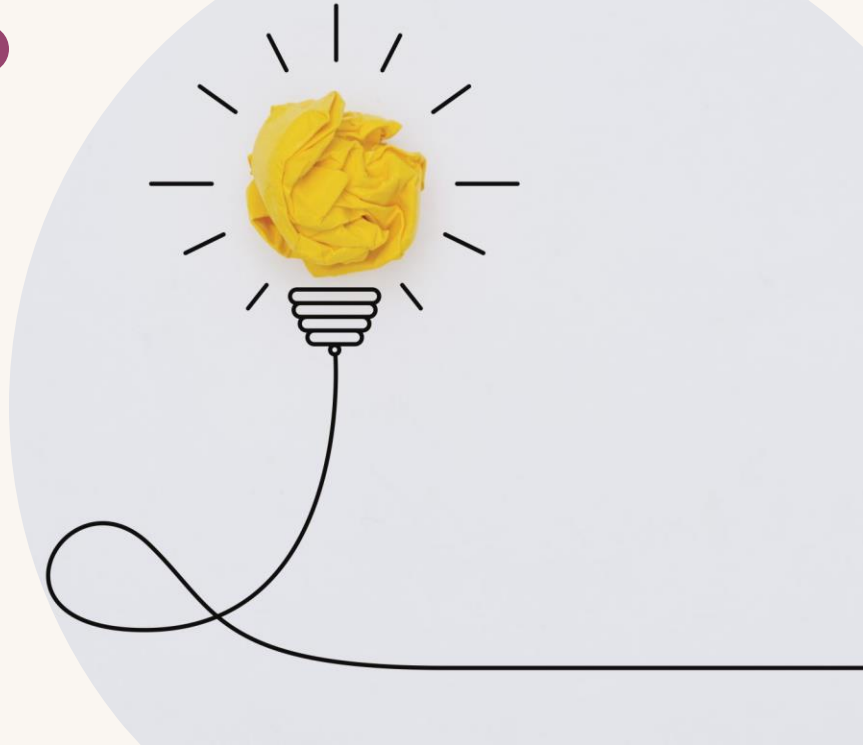
SkolarAi Robo Club

Module 02: Variable and Data Type



🎯 Objective

By the end of this module, students will:

- Understand what **variables** are and why they're important.
- Learn how to **store and use data** in Python.
- Perform **basic math operations**.
- Get **user input** and use it in a program.

What is a Variable?

- A **variable** is like a **box** that stores information.
- You can **name** the box and **put a value** inside it.
- Later, you can **use** the box again or **change** what's inside

Example Analogy:

- Think of a variable as a **labeled jar**.
- You can write “cookies” on it and fill it with 10 cookies.
- If you eat one, you can change it to 9 cookies.

```
cookies = 10
print(cookies)
```

Output

```
10
```

Naming Variables

- Variable names can contain **letters, numbers, and underscores (_)**.
- They **cannot start with a number**.
- They **cannot have spaces**.
- Python is **case-sensitive** — **Age** and **age** are different.

✅ Good Examples:

python

```python
name = "Aarav"
age = 12
favorite_color = "blue"
```

🚫 Bad Examples:

python

```python
2name = "Aarav"      # ❌ starts with a number
favorite color = "blue"  # ❌ space not allowed
Name = "Aarav"       # ⚠️ different from name
```

Data Type In Python

Type	Example	Description
String (str)	`"Hello"`	Text inside quotes
Integer (int)	`7`	Whole numbers
Float (float)	`3.5`	Decimal numbers
Boolean (bool)	`True, False`	True/False values

CODE:

```
name = "Aarav"     # string
age = 12           # integer
height = 4.8       # float
is_student = True  # boolean

print(name, age, height, is_student)
```

OUTPUT:

```
Aarav 12 4.8 True
```

Doing Math with Variables

- You can use Python like a **calculator**.
- Operators:
  i. Add (+)
  ii. Subtract (-)
  iii. Multiply (*)
  iv. Divide (/)
  v. Power (**)

Example:

python

```python
a = 10
b = 5

print("Addition:", a + b)
print("Subtraction:", a - b)
print("Multiplication:", a * b)
print("Division:", a / b)
print("Power:", a ** b)
```

Output:

makefile

```
Addition: 15
Subtraction: 5
Multiplication: 50
Division: 2.0
Power: 100000
```

Combining Text and Numbers

- You can **combine** text and variables using **f-strings** or **commas** in `print()`.

Example 1 (using commas):

```
name = "Aarav"
age = 12
print("My name is", name, "and I am", age, "years old.")
```

- Example 2 (using f-strings – modern way):

```
print(f"My name is {name} and I am {age} years old.")
```

Output:

```
My name is Aarav and I am 12 years old.
```

Getting Input from the User

- Use **`input()`** to **ask the user for information**.
- It always returns text (string).
- You can convert it to numbers with `int()` or `float()` if needed.

💬 Example:

python

```python
name = input("What is your name? ")
print("Hello,", name, "! Welcome to Python.")
```

🧩 Output:

pgsql

```
What is your name? Aarav
Hello, Aarav! Welcome to Python.
```

💬 Example (with numbers):

python

```python
age = input("Enter your age: ")
print("Next year you will be", int(age) + 1)
```

🧩 Output:

mathematica

```
Enter your age: 12
Next year you will be 13
```

Mini Calculator Program

- Let’s combine what we’ve learned!

Example:

python

```python
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))

print("Addition:", num1 + num2)
print("Subtraction:", num1 - num2)
print("Multiplication:", num1 * num2)
print("Division:", num1 / num2)
```

Output:

```yaml

Enter first number: 6
Enter second number: 3
Addition: 9
Subtraction: 3
Multiplication: 18
Division: 2.0
```

Common Mistakes

Mistake	Problem	Fix
Using quotes around numbers	Python treats it as text	Use without quotes: `age = 10`
Trying to add text + number	Type error	Use `f-string`: `print(f"I am {age}")`
Forgetting to convert input	Input stays text	Use `int(input())` for numbers

Fun Activities

- Activity 1 – “About Me” Program
  - Ask the user for a number and print double its value.

```
num = int(input("Enter a number: "))
print("Double of your number is", num * 2)
```

Activity 3 – “Cookie Jar”

Simulate giving away cookies!

```
cookies = 12
print("You have", cookies, "cookies.")
eat = int(input("How many cookies do you eat? "))
cookies = cookies - eat
print("Now you have", cookies, "cookies left.")
```

Module Summary

Concept	What You Learned
Variable	A box to store data
Data Types	String, Integer, Float, Boolean
Operators	+, -, *, /, **
Input	To get data from the user
f-strings	Combine text and variables easily

🏁 Module 2 Challenge: Personal Info Card

Task: Make a “Digital ID Card” using everything you’ve learned.

- Ask for name, age, hobby, and favorite color — then print them beautifully.

```python
print("===== My Python ID Card =====")
name = input("Enter your name: ")
age = int(input("Enter your age: "))
hobby = input("Your favorite hobby: ")
color = input("Your favorite color: ")

print("\nHere’s your ID Card!")
print("----------------------------")
print(f"Name: {name}")
print(f"Age: {age}")
print(f"Hobby: {hobby}")
print(f"Favorite Color: {color}")
print("----------------------------")
print("Welcome to the Python Club! 🐍")
```

Thank you