

# 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.

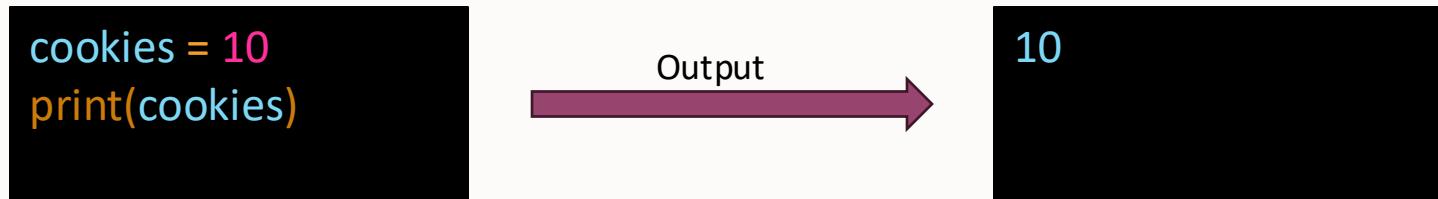
# What is a Variable?

- 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.



# 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
```

```
name = "Aarav"
```

```
age = 12
```

```
favorite_color = "blue"
```

## Bad Examples:

```
python
```

```
2name = "Aarav"      # ✗ starts with a number
```

```
favorite color = "blue"  # ✗ space not allowed
```

```
Name = "Aarav"        # ▲ different from name
```



# What Are Data Types?

Imagine you have a **toy box** 🧑‍熊 .

Inside, you can keep **different kinds of toys** — cars, dolls, balls, blocks.

In Python, your **computer's memory** is like that toy box.

It stores **different kinds of data** — numbers, words, lists, etc.

Each kind of data has a **data type**.

# Main Data Types in Python

## 1 Numbers (int, float)

Used for counting and math.

- **int (integer):** Whole numbers

Example:

```
age = 10
```

👉 10 is an **integer** (no decimal point)

- **float:** Numbers with a decimal

Example:

```
height = 4.5
```

👉 4.5 is a **float** (has a decimal)

## 2 Text (str → string)

- Used for writing words or sentences.

Example:

```
name = "Harry"
```

👉 "Harry" is a **string** (it's inside quotes " ")

💡 Tip: Anything inside " " or ' ' is a string.

# Data Type In Python

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

- Data types in Python are like different kinds of “stuff” your computer can understand — numbers, words, true/false, lists, and more!
- They help Python know what kind of thing it’s working with — just like you know the difference between a toy car, a doll, and a ball in your toy box.

## 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

```
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

```
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

```
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
```

```
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: <code>print(f"I am {age}")</code>
Forgetting to convert input	Input stays text	Use <code>int(input())</code> 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.

```
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