



INTRODUCTION TO PYTHON AND PROGRAMMING

PYTHON CLASSES | 28 JAN 2024

Welcome to Python Programming!

Topics will be covered today:

- Introduction to Python
- Python Syntax, Variables, and Data Types
- Input/Output Operations

Why Python is Awesome

- High-level, versatile programming language.
- Widely used in web development, data science, AI, scripting, and more.
- Easy-to-learn syntax, perfect for beginners.
- Huge community and plenty of resources.

What is Programming?

- Telling a computer what to do using instructions.
- Programming helps automate tasks and solve problems.
- Think of it like giving step-by-step directions to a robot!

Python in a Nutshell

- General-purpose, high-level programming language.
- Focuses on readability and simplicity.

Example of Python's simplicity:

python

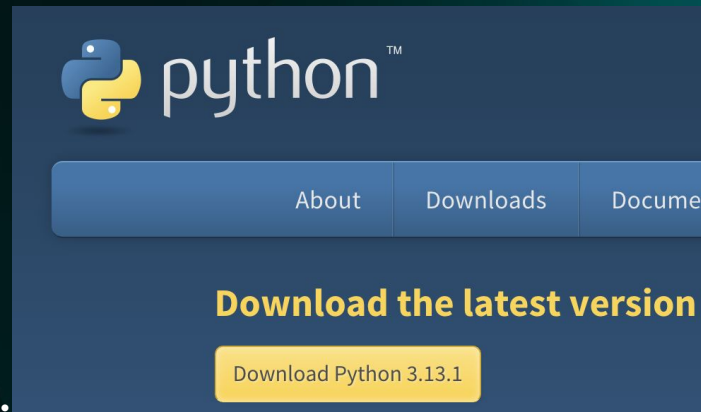
```
print("Hello, World!")
```

java

```
public class Main {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}
```

Setting up Python

1. Install Python from python.org/downloads .
2. Use an editor like [VS Code](#), [PyCharm](#) and etc.




Variables in Python

What Are Variables?

Variables store data that your program can use.

Naming rules:

- Must start with a letter or underscore.
- Can't use spaces or special characters.
- Case-sensitive.

```
 main.py > ...  
1     name = "John"  
2     age = 30  
3     is_happy = True
```

Data Types

Common Data Types in Python

- **Basic data types:**
 - int (e.g., 10)
 - float (e.g., 3.14)
 - str (e.g., "Hello")
 - bool (e.g., True/False)

```
1    number = 42
2    price = 19.99
3    message = "Welcome!"
4    is_ready = False
```


Input and Output

Input: Getting data from the user.

```
1  name = input("What is your name? ")  
2  print("Hello, " + name + "!!")
```

Output: Displaying information.

```
1  print("This is Python!")
```

Combine input and output for interaction.

Print Function

Purpose: Used to display messages or variable values in the console.

1. Print a simple message:

```
print("Hello, World!")
```

2. Print multiple items:

```
print("Name:", "John", "Age:", 25)
```

3. Use formatted strings (f-strings):

```
name = "Alice"  
age = 30  
print(f"My name is {name} and I am {age} years old.")
```

The input() Function: Interacting with Users

Purpose: Allows the program to accept user input.

1. Simple input:

```
name = input("What is your name? ")  
print("Hello, " + name + "!")
```

2. Using numbers with int or float casting:

```
age = int(input("Enter your age: "))  
print(f"You are {age} years old.")
```

input() always returns a string, so you may need to convert it for numbers.

Provide clear prompts to guide users.

The input() Function: Interacting with Users

Purpose: Allows the program to accept user input.

1. Simple input:

```
name = input("What is your name? ")  
print("Hello, " + name + "!")
```

2. Using numbers with int or float casting:

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age = int(input("Enter your age: "))  
print(f"You are {age} years old.")
```

input() always returns a string, so you may need to convert it for numbers.

Provide clear prompts to guide users.

Type Casting: Converting Between Data Types

Purpose: Converts one data type to another (e.g., string to integer, float to integer).

Common casting functions:

`int()` - Converts to integer.

```
age = int(input("Enter your age: "))  
print(f"Next year, you will be {age + 1} years old.")
```

`float()` - Converts to floating-point number.

```
number = 5.8  
print(int(number)) # Output: 5
```

`str()` - Converts to string.

```
num = 100  
print("Number: " + str(num))
```

Common Errors

Errors are part of the learning process.

- Examples of common errors:
 - `SyntaxError`: Missing indentation or quotes.
 - `NameError`: Using an undefined variable.
- Tips to debug:
 - Read the error message carefully.
 - Check your syntax and spelling.

Let's write our first program

Simple program to:

1. Ask for the user's name.
2. Ask for their birth year.
3. Calculate their age.

```
name = input("What is your name? ")
birth_year = int(input("What year were you born? "))
age = 2025 - birth_year
print(f"Hello, {name}! You are {age} years old.")
```

More Exercises

Let's Practice!

Task 1: Write a program that asks for two numbers and prints their sum.

Task 2: Create a program that greets the user with their name.

Task 3: Write a program to convert Celsius to Fahrenheit:

Some materials to read

1. [Python print\(\) Function](#)
2. [Python input\(\) function](#)
3. [Python Casting](#)