Python
for everybody

Environment Setup

- Go to https://www.python.org
- Download and install the latest version of Python
- Type and run your very first line of code:

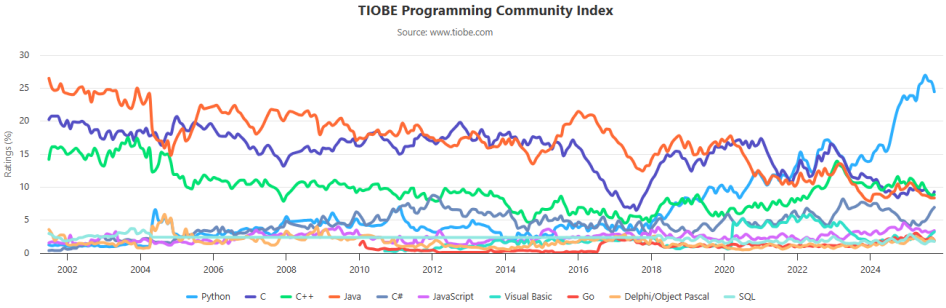
```
1 print("hello world!")
```

Introduction

Python is an interpreted, high-level, general-purpose programming language.
It is known for being beginner-friendly with a simple, readable syntax.
Its extensive standard library makes it very popular for everything :

- automation
- web development
- data analysis
- scripting
- machine learning

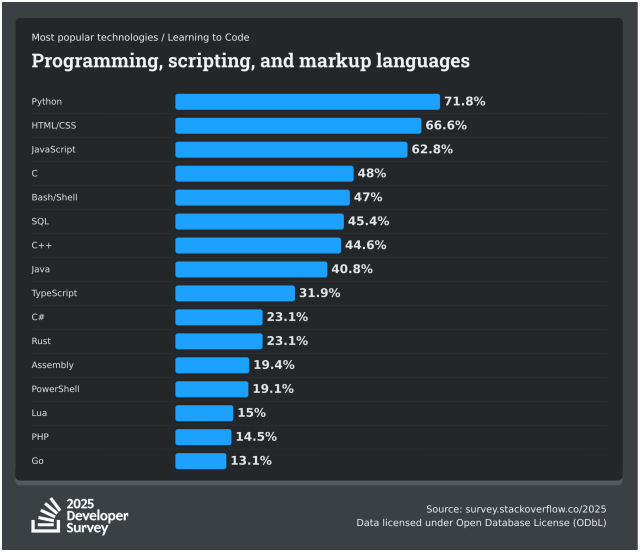
Some motivation



Important :

It is important to note that the TIOBE index is not about the best programming language or the language in which most lines of code have been written. The index can be used to check whether your programming skills are still up to date or to make a strategic decision about what programming language should be adopted when starting to build a new software system.

Some motivation



Some motivation

```c
C

#include <stdio.h>
int main() {
    printf("Hello world\n")
    ;
    return 0;
}
```

```java
JAVA

public class App {
    public static void main(String[] args)
     {
        System.out.println("Hello world");
    }
}
```

```python
Python

print("Hello world")
```

1. Variables

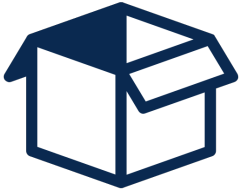
1. Variables

1.1. Definition

Variables

A variable is an allocated space in the computer's memory used to store data that can change during a program's execution.

Simple analogy:
You can think of a variable as a box where you can store a value.
You can later open the box and replace the value with another one.



1. Variables

1.2. Data types

Data types

A variable can hold different types of data, including:

- **int** : integer numbers (e.g., 5, -12, 100)
- **float** : decimal numbers (e.g., 3.14, 0.5, -2.7)
- **str** : text or string of characters (e.g., "Hello", 'Python')
- **bool** : logical values (True or False)

Practice

1. Task: Assign Multiple Values of Different Types

```
Club = "AppsClub"
is_my_favorite_club = True
members = 1000
price = 10.00
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print("AppsClub has",members,"members")
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3. Task: Use the type() function to check the data type of each variable.

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print(type(Club))
print(type( is_my_favorite_club))
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```

4. Task: Write a short program that swaps the values of two variables.

1. Variables

1.3. Data manipulation

Data manipulation

A. Arithmetic Operations:

```
a  = 15
b = 6
c  = a + b   =>  21
a / b ===> 2.5
a // b ====> 2
a % b ====> 3
c = c + 1
2**3 = 8
```

Data manipulation

B. String Operations:

```
f_name = "ahmed"
l_name = "karim"
full_name = f_name + " " + l_name
line = "-"
line * 20
```

C. Boolean and comparison Operations:

```
a , b = 10 , 5
compare = (a == b)
compare = (a >= b)
print( a < b)
print( a != b )
```

1. Variables

1.4. Casting a variable

Casting a variable

Try this example:

```
1 a = '1'
2 print(a + 1)
```

What happens ?

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Solution:
Casting a variable means converting the type of its value from one data type to another using built-in functions such as int(), str(), float(), or bool().

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Exemple:

```
a =  10
a = str(a)    ==>  "10"
b = 6.53
b = int(b)   ==>  "6"
```

1. Variables

1.5. Pythonic tricks

Pythonic Tricks

```python
# Assign the same value to multiple variables
a = b = c = 1

# Assign multiple values in a single line
name, age = "Ali", 16

# Swap values between two variables
a, b = b, a
```

Practice

2. Contol Flow Structures

2. Contol Flow Structures

2.1. Conditional Statements

2. Contol Flow Structures

2.2. Loops

2. Contol Flow Structures

2.3. Jump Statements