

# Python Introduction

---

Thursday, 1 December 2022

*“An investment in knowledge pays  
the best interest”*

- BENJAMIN FRANKLIN

# Today's Agenda

---

## An Introduction to Python

- Necessity Of Programming
- What Is Python ?
- Why And Who Created It ?
- **What Python Can Do ?**
- **Why Should I Learn Python In 2018 ?**
- **Important Features**

# Why Do We Need Programming?

---

- To communicate with **digital machines** and make them work accordingly
- Today in the programming world , we have more than **800** languages available.
- And every language is designed to fulfill a **particular kind of requirement**

# Brief History Of Programming Language

---

- **C language** was primarily designed to develop “System Software” like Operating Systems, Device Drivers etc.
- To remove security problems with “C” language , **C++ language** was designed.
- It is an Object Oriented Language which provides data security and can be used to solve real world problems.
- Many popular softwares like Adobe Acrobat , Winamp Media Player, Internet Explorer, Mozilla Firefox etc. were designed in **C++**
- Courtesy: <http://www.stoustrup.com/applications.html>

# What is Python ?

---

- Python is a **general purpose** and **powerful** programming language.
- It is free and open-source.
- Python is considered as one of the **most versatile programming language** as it can be used to develop almost any kind of application including **desktop application**, **web applications**, **CAD** , **Image processing** and many more.

# Who created Python ?

---

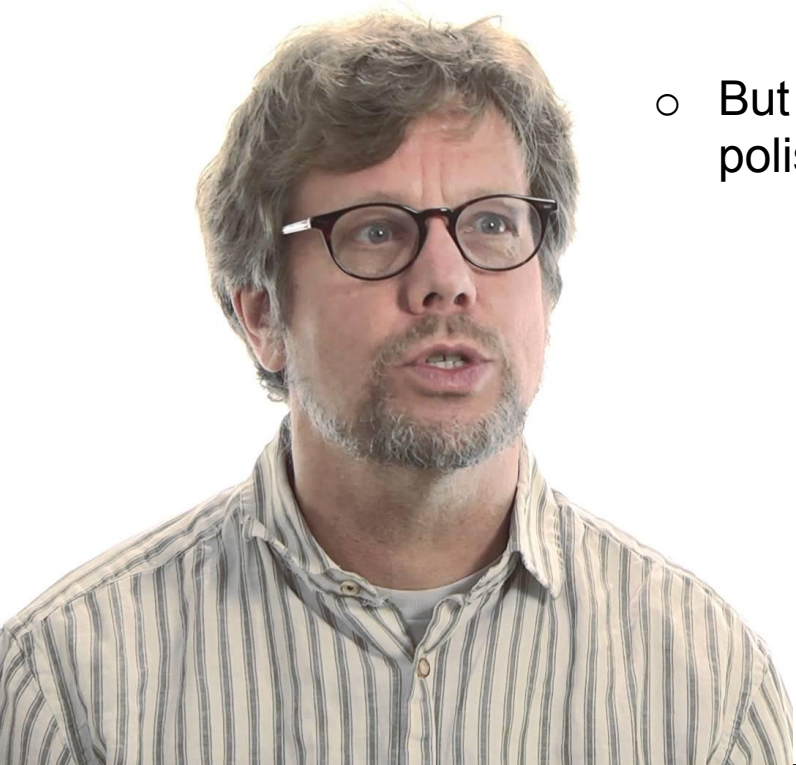
- Developed by **Guido van Rossum** , a Dutch scientist
- Created at **Center For Mathematics and Research** ,  
Netherland
- It is inspired by another programming language called **ABC**



# Why was Python created ?

---

- **Guido** started Python development as a hobby in 1989
- But since then it has grown to become one of the most polished languages of the computing world.





# How Python got it's name?

---

- The name Python is inspired from Guido's favorite **Comedy TV show** called "**Monty Python's Flying Circus**"
- Guido wanted a name that was short, unique, and slightly mysterious, so he decided to call the language Python.



# Who manages Python today ?

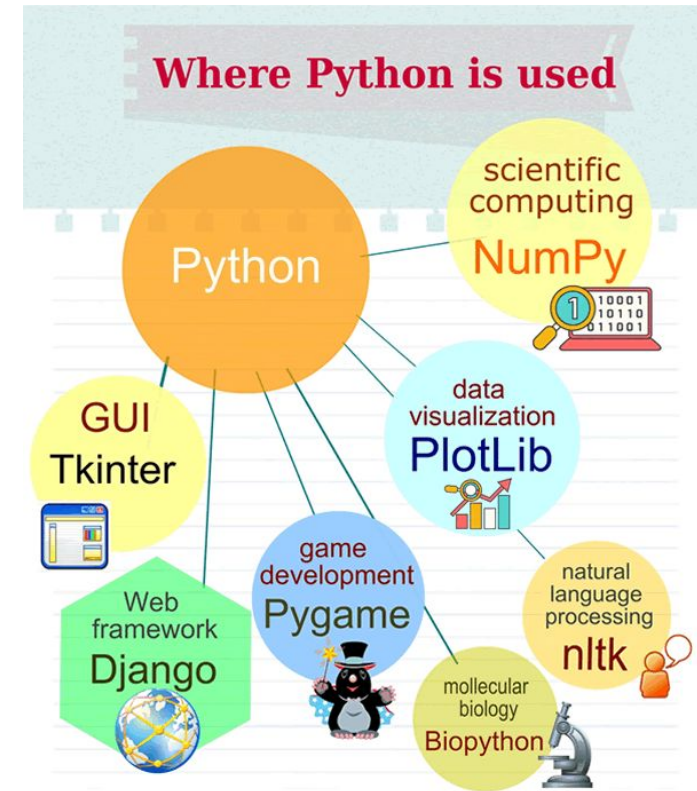
---

- From version 2.1 onwards , python is managed by **Python Software Foundation** situated in **Delaware , USA**
- It is **a non-profit organization** devoted to the growth and enhancement of Python language
- Their website is **<http://www.python.org>**



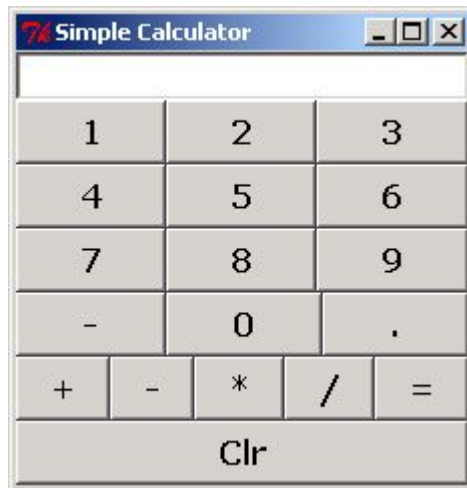
# What Python can do ?

- GUI Application
- Web Application
- Data Analysis
- Machine Learning
- Raspberry Pi
- Game Development



# GUI In Python

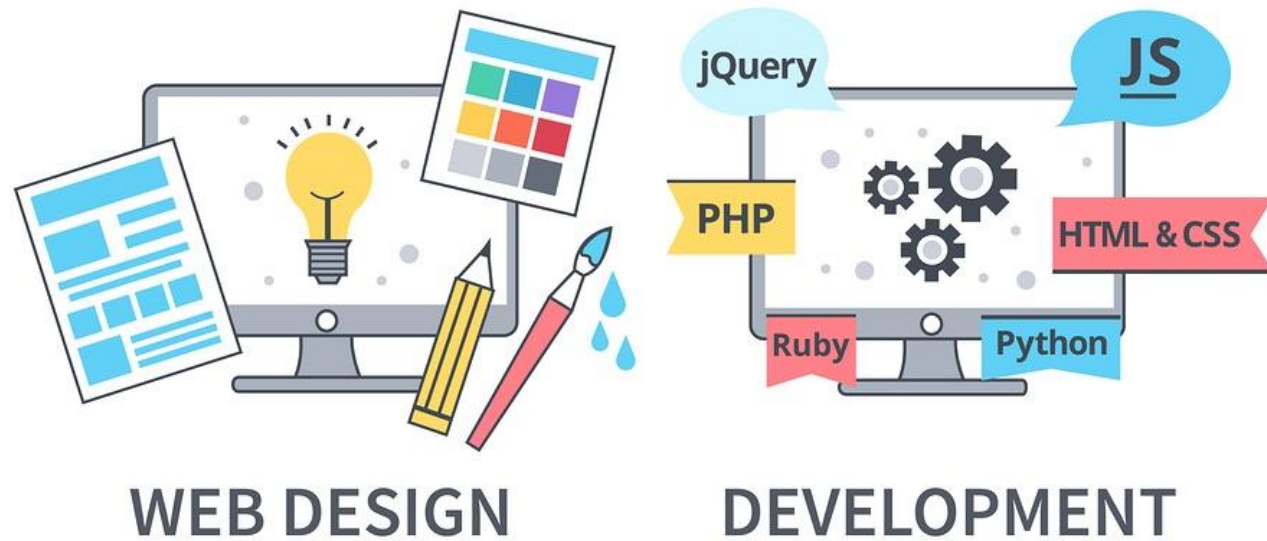
---



- Python is used for GUI apps all the time.
- It has famous libraries like PyQt , Tkinter to build desktop apps.

# Web Application in Python

---



- We can use Python to create web applications on many levels of complexity
- There are many excellent Python frameworks like **Django**, **FastAPI** and **Flask** for this purpose

# Data Analysis In Python

---



- **Data Analysis is about making predictions with data**
- Python is the leading language of choice for many data scientists
- It has grown in popularity due to its excellent libraries like **NumPy** , **Pandas** etc.

# Machine Learning In Python

---



Machine learning is a field of AI (**Artificial Intelligence**) by using which **software applications** can learn to increase their accuracy for the expecting outcomes.

It is heavily used in **Face recognition** , **music recommendation** , **medical data** etc.

Python has many wonderful libraries to implement ML algos like **SciKit-Learn** , **Tensorflow** etc.

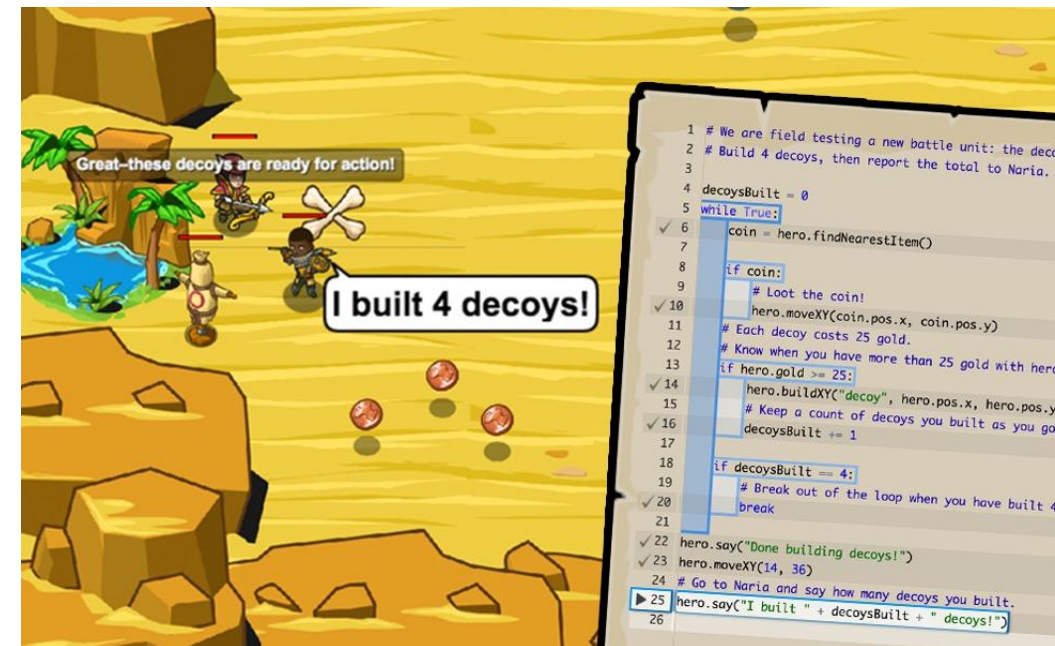


# Game Development In Python

We can write whole games in **Python** using **PyGame**.

Popular games developed in Python are:

**Bridge Commander**  
**Civilization IV**  
**Battlefield 2**  
**Eve Online**  
**Freedom Force**





# Why should I learn Python ?

---











Most popular programming

Opens lots of doors

Big corporates prefer Python

Means , **PYTHON IS THE FUTURE**

## TIOBE Index 2022

Programming Language	Ratings	Change
 Python	17.18%	+5.41%
 C	15.08%	+4.35%
 Java	11.98%	+1.26%
 C++	10.75%	+2.46%
 C#	4.25%	-1.81%
 Visual Basic	4.11%	-1.61%
 JavaScript	2.74%	+0.08%
 Assembly language	2.18%	-0.34%
 SQL	1.82%	-0.30%
 PHP	1.69%	-0.12%

# Who uses Python today ?

---



# Features Of Python

---

- Simple
- Dynamically Typed
- Robust
- Supports multiple programming paradigms
- Compiled as well as Interpreted
- Cross Platform
- Extensible
- Embedded
- Extensive Library

# Simple

---

- **Python** is very simple
- As compared to other popular languages like **Java** and **C++**, it is easier to code in **Python**.
- **Python** code is comparatively 3 to 5 times smaller than **C/C++/Java** code

# Print Hello World!



## IN C

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



## IN JAVA

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



## IN PYTHON

```
print('Hello World!')
```

# Swap 2 Nos



## IN C

```
int a=10,b=20,temp;  
temp=a;  
a=b;  
b=temp;
```



## IN JAVA

```
int a=10,b=20,temp;  
temp=a;  
a=b;  
b=temp;
```



## IN PYTHON

```
a,b=10,20  
a,b=b,a
```

# Dynamically Typed

---

## Dynamically typed vs Statically typed

### Statically Typed (C/C++/Java)

- Need to declare variable type before using it
- Cannot change variable type at runtime
- Variable can hold only one type of value throughout its lifetime

### Dynamically Typed – Python

- Do not need to declare variable type
- Can change variable type at runtime
- Variable can hold different types of value through its lifetime

# Dynamically Typed

---

## IN C

```
int a;  
a=10;  
a="World";
```

## IN Python

```
a=10  
a="World"
```



# Robust

---

Python has very strict rules which every program must compulsorily follow and if these rules are violated then Python terminates the code by generating “**Exception**”

To understand python’s robustness , guess the output of the following /C++ code:

```
int arr[5];
int i;
for(i=0;i<=9;i++)
{
arr[i]=i+1;
}
```

# Python exceptions

---

In Python if we write the same code then it will generate **Exception** terminating the code

Due to this other running programs on the computer do not get affected and the system remains safe and secure

# Supports Multiple Programming Paradigms

---

Python supports both **procedure-oriented** and **object-oriented** programming which is one of the key python features.

In **procedure-oriented** languages, the program is built around **procedures** or **functions** which are nothing but reusable pieces of programs.

In **object-oriented** languages, the program is built around **objects** which combine **data** and **functionality**

# Compiled As Well As Interpreted

---

Python uses both a compiler as well as interpreter for converting our source and running it

**However , the compilation part is hidden from the programmer** ,so mostly people say it is an interpreted language

# Cross Platform

---

- Let's assume we've written a Python code for our **Windows machine**.
- Now, if we want to run it on a **Mac**, we don't need to make changes to it for the same.
- In other words, we can take one code and run it on any machine, **there is no need to write different code for different machines**.
- This makes Python a **cross platform language**

# Extensible

---

- Python allows us to call C/C++/Java code from a Python code and thus we say it is an extensible language
- We generally use this feature when we need a critical piece of code to run very fast .
- So we can code that part of our program in C or C++ and then use it from our Python program.

# Embedded

---

- We just saw that we can put code in other languages in our Python source code.
- However, it is also possible to put our Python code in a source code in a different language like C++.
- This allows us to integrate Python feature into our program of the other language.

# Extensive Library

---

- The Python Standard Library is huge indeed.
- It can help you do various things like Database Programming , E-mailing ,GUI Programming etc



---

Thank you