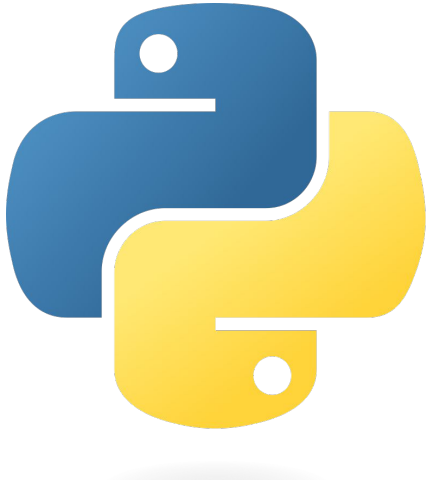


Python Programming Language

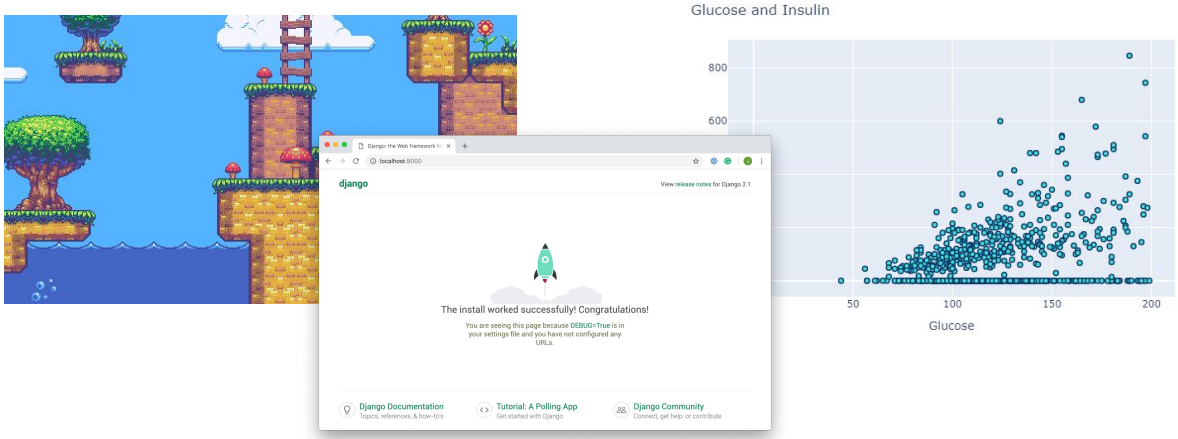
What is python !?

Python is a high-level interpreted programming language. Python's design philosophy emphasizes code readability through the use of clean syntax and significant whitespace. And it makes for a no-brainer decision to use it for both beginner and experienced programmers.

In additional, Python is a general-purpose programming language.

Example

- Game
- Data Analytic
- Website

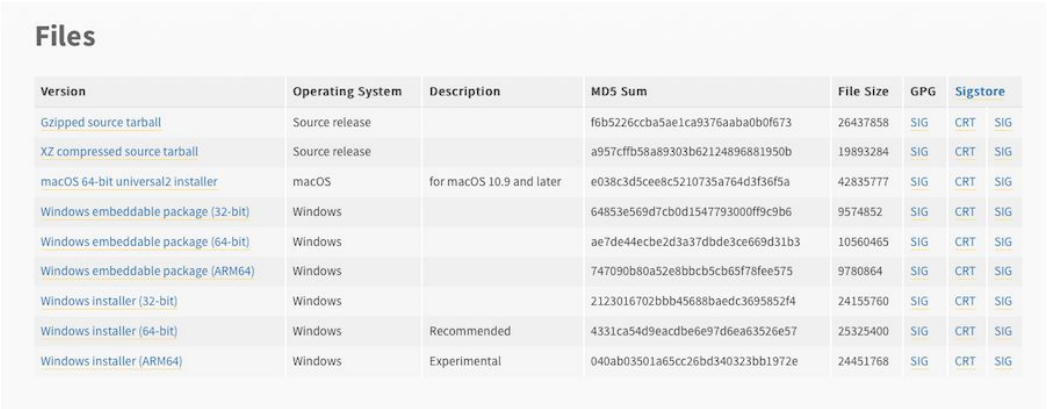


How to install python?

1. Download python in https://www.python.org/downloads/
2. Run the installer
3. Customize the Installation
4. Install Python
5. Verify the installation

Download Python

Visit the official Python website and download the latest version for Windows. The website will automatically detect your operating system and offer the appropriate installer for your system (32-bit or 64-bit).

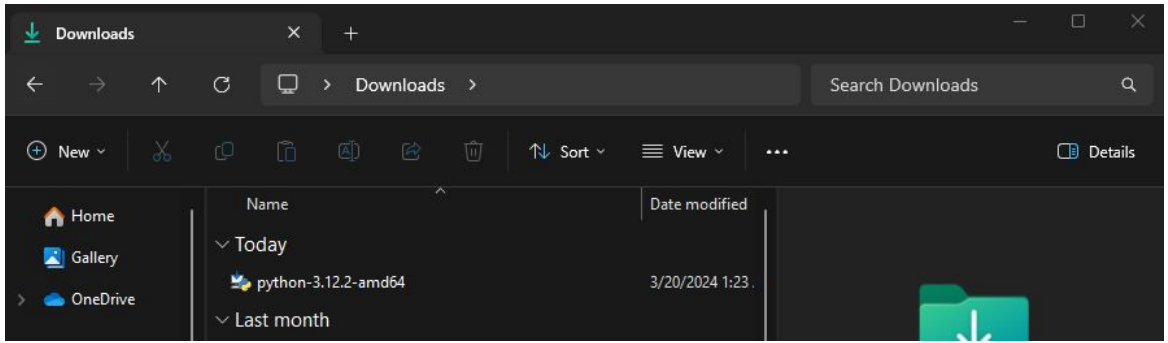


Files

Version	Operating System	Description	MD5 Sum	File Size	GPG	Sigstore	
Gzipped source tarball	Source release		f6b5226ccba5ae1ca9376aaba0b0f673	26437858	SIG	CRT	SIG
XZ compressed source tarball	Source release		a957cffb58a89303b62124896881950b	19893284	SIG	CRT	SIG
macOS 64-bit universal2 installer	macOS	for macOS 10.9 and later	e038c3d5cee8c5210735a764d3f36f5a	42835777	SIG	CRT	SIG
Windows embeddable package (32-bit)	Windows		64853e569d7cb0d1547793000ff9c9b6	9574852	SIG	CRT	SIG
Windows embeddable package (64-bit)	Windows		ae7de44ecbe2d3a37dbde3ce669d31b3	10560465	SIG	CRT	SIG
Windows embeddable package (ARM64)	Windows		747090b80a52e8bbcb5cb65f78fee575	9780864	SIG	CRT	SIG
Windows installer (32-bit)	Windows		2123016702bbb45688baedc3695852f4	24155760	SIG	CRT	SIG
Windows installer (64-bit)	Windows	Recommended	4331ca54d9eacdbe6e97d6ea63526e57	25325400	SIG	CRT	SIG
Windows installer (ARM64)	Windows	Experimental	040ab03501a65cc26bd340323bb1972e	24451768	SIG	CRT	SIG

Run installer

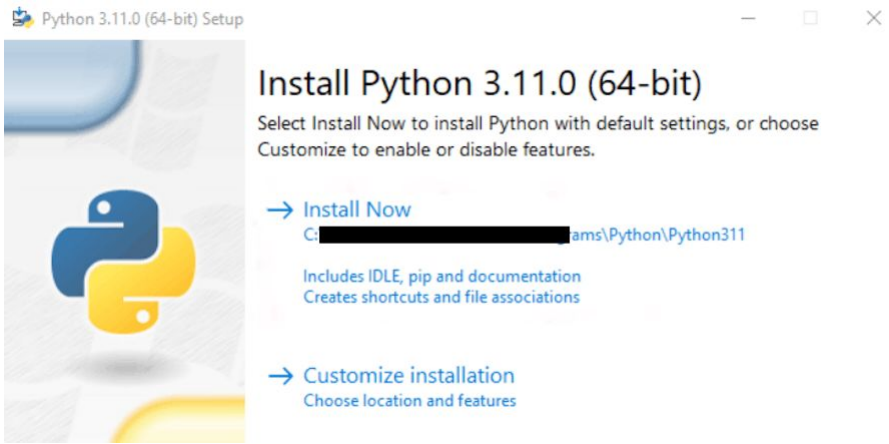
Locate the downloaded installer file (usually in your Downloads folder) and double-click on it to run the installation process. You may be prompted by the User Account Control (UAC) to allow the installation. Click Yes to proceed.



Customize the Installation

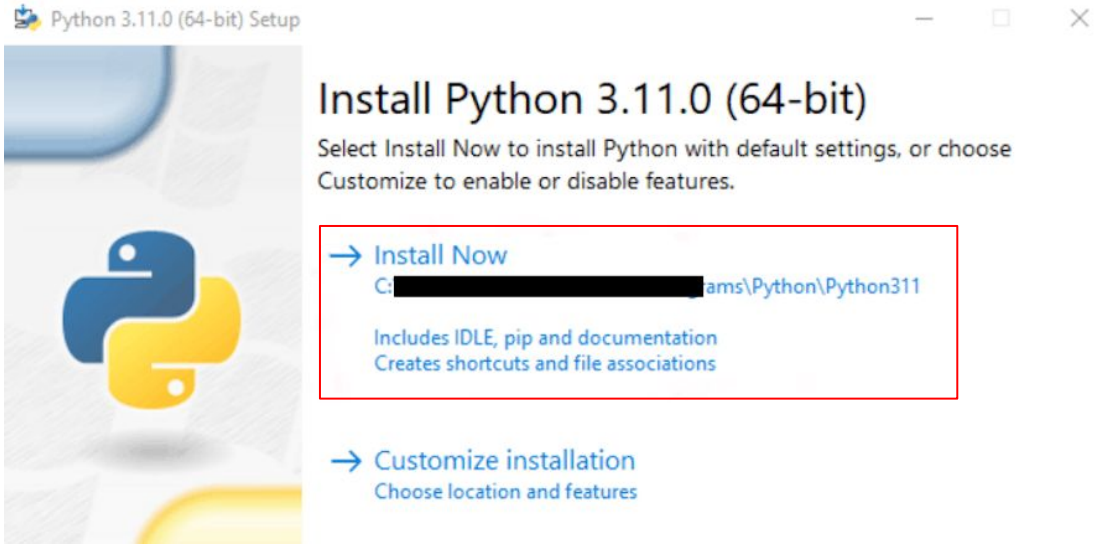
On the installer's welcome screen, you'll see two options

1. Install Now
2. Customize installation



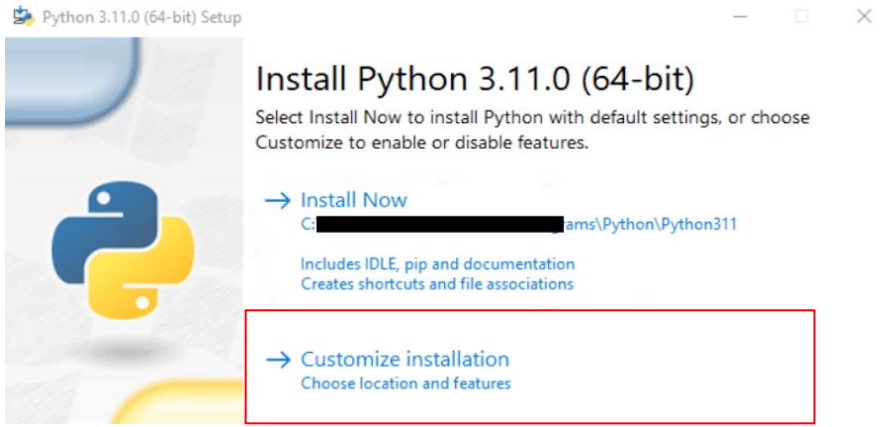
Customize the Installation

If you want to install Python with the default settings, simply click Install Now.



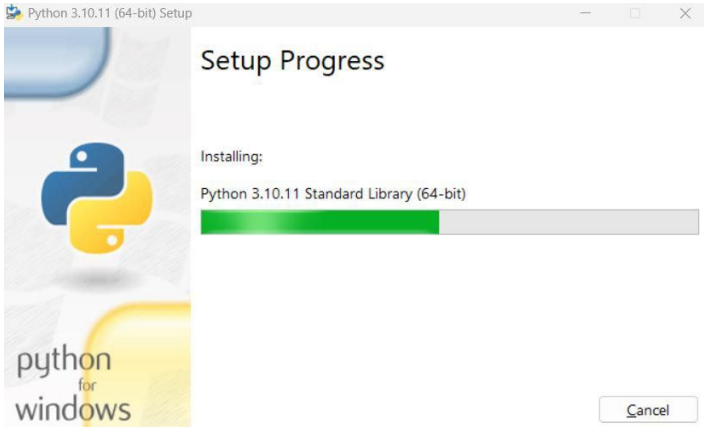
Customize the Installation

If you want to customize the installation (changing the installation directory or selecting specific components, for instance), click Customize installation.



Install Python

After selecting your desired installation settings, click Install to begin the installation process. The installer will copy the necessary files to your computer and set up Python. This process may take a few minutes.



Verify the installation

Once the installation is complete, you can verify that Python has been installed correctly by opening the Command Prompt and typing the following command:

```
python --version
```

Integrated Development Environment (IDE)

Popular IDE of python

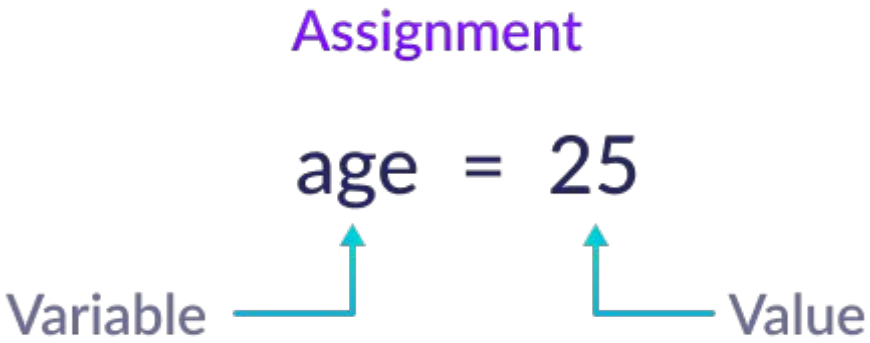
1. VScode
2. Pycharm
3. Spyder

Structure

1. Variable
2. Data Types
3. Operator
4. Statement
5. Program Structure

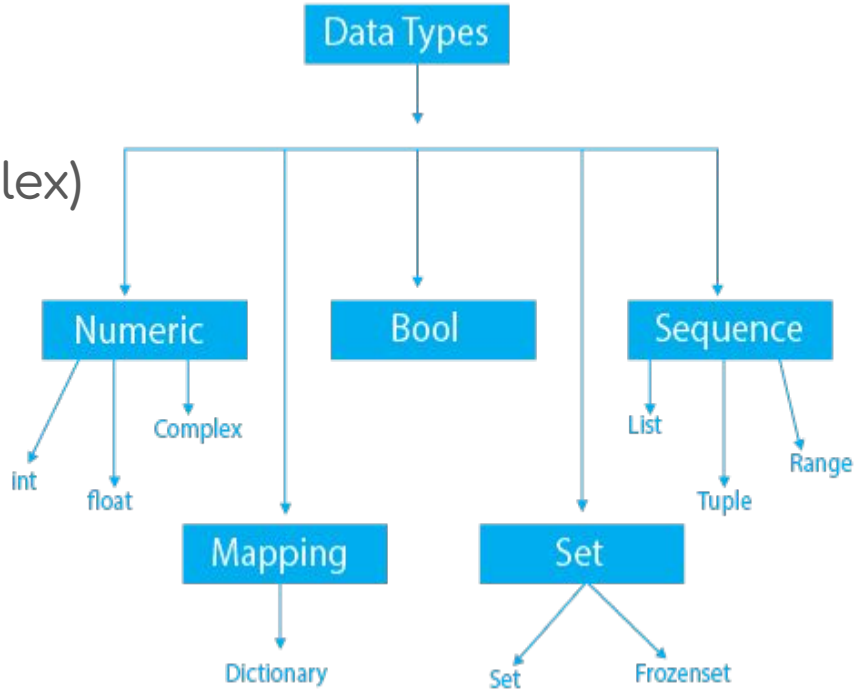
Variable

1. Variable
2. Value



Data Types

1. Numeric (Integer, Float, Complex)
   - Integer: 1
   - Float: 2.0
   - Complex: 3+2i
2. String
   - “Cherry”
3. List
   - [“Apple”, “Orange”]
4. Dictionary
   - {“name”: “HALL”, “age”: “30”}
5. Tuple
   - (“1”, “2”, “3”) look like **List** but it cannot edit when you created



Arithmetic Operators

Operator	Result
+	10 + 20 = 30
-	20 - 10 = 10
*	20 * 2 = 40
/	20 / 3 = 6.666666666666667
//	20 // 3 = 6
%	20 % 3 = 2

Comparison Operators

a = 10 , b = 6

Operator	Result
==	a == b: False
!=	a != b: True
<	a < b: False
>	a > b: True
<=	a <= b: False
>=	a >= b: True

Logical Operators

Operator	Result
and	True and True: True True and False: False False and True: False False and False: False
or	True or True: True True or False: False False or True: False False or False: True
not	not True: False not False: True

Identify Operators

Operator	Result
is	a=10 b=10 a is b = False a=10 a=b a is b = True
is not	a=10 b=10 a is not b = True

Membership Operator

Operator	Result
in	a=3 b=[1,2,3] a in b = True
not in	a=3 b=[1,2,3] a not in b = False

Assignment Operators

Operator	Result
=	a = 10
+=	a += 10 a = a + 10
-=	a -= 10 a = a - 10
*=	a *= 10 a = a * 10
/=	a /= 10 a = a / 10
%=	a %= 10 a = a % 10

Bitwise Operator

a = 10 (binary: 1010) , b = 6 (binary: 0110)

Operator	Result
& (AND)	a & b = 2 (binary: 0010)
| (OR)	a | b = 14 (binary: 1110)
^ (XOR)	a ^ b = 12 (binary: 1100)
~ (NOT)	~a = 10 (binary: 1010)
<< (Shift bit left)	a << 2 = 40 (binary: 101000) 10 >> 2 = 2 (10 / 2^2 = 2)
>> (Shift bit right)	a >> 2 = 2 (binary: 000010) 10 << 2 = 40 (10 * 2^2 = 40)

How to Shift Bit Left (<<)

x = 10: (binary: 1010) shift bit from the left 2 bit

1. shift 2 bit to the left side: 10
2. Add bit 0 to left side 2 bit: 0010 (decimal: 2)
3. 10 * (2^2) = 40 (binary: 101000)

Ans 101000

How to Shift Bit Right (>>)

x = 10: (binary: 1010) shift bit from the right 2 bit

1. shift 2 bit to the right side: 10
2. Add bit 0 to left side 2 bit: 0010 (decimal: 2)

Ans 0010

Sequence Operator

Operator	Result
()	10 + (20 - 20) = 10
**	10 ** 2 = 100
*, /, //, %	20 * 2 = 40
+,-	20 - 10 = 10
==, !=, <, >, <=, >=	10 == 10: True
and, or, not	True and True: True
=, +=, -=, *=, /=, %=, //=	10 + 10 = 20
=	A = 10

if-elif-else

Pattern

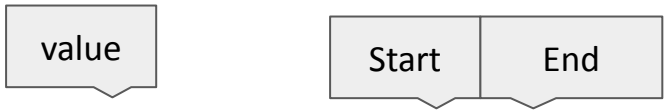
```
a = 10, b = 2
If (condition):
        Do somethings…
elif (condition):
        Do somethings…
else:
        Do somethings…
```

Use Case

```
a = 10, b = 2
If (a == b):
        print(“a == b”)
elif (a/2 == 10):
        print(“a/2 == 10”)
else:
        print(“a !=b and a/2  != 10”)
```

for-loop

Pattern




```
for value in range(0,10):

    print(value)
```

Result

0

1

2

3

…

9

While loop

Pattern

```
i=0
While (i>=10):
    i+=1
    print(i)
```

Result

0

1

2

3

…

9

Function

Pattern

```
def function_name():
    print("Test Function")
```

Use Case

```
function_name()
```

Result

```
Test Function
```

Return Function

Pattern

```
def function_name():
    return 10
```

Use Case

```
a = function_name() + 10
print(a)
```

Result:

20

Return if-elif-else

Pattern

```
If (condition):
        return something
elif (condition):
        return something
else:
        return something
```

Use Case

```
a = 10, b = 2

def return_result():
        If (a == b):
                return 10
        elif (a/2 == 10):
                return 20
        else:
                return 30

print(return_result())
```

Result

30

Scope Variable

Local Scope

```
def myfunc():
        x=10
        print(x)


myfunc()
print(x)
```

Result

NameError: name ‘x’ is not defined

Global Scope

```
x = 30
def myfunc():
        global a
        a = x+10
        print(x)
myfunc()
print(a)
```

Result

40