

Machine Learning Diploma

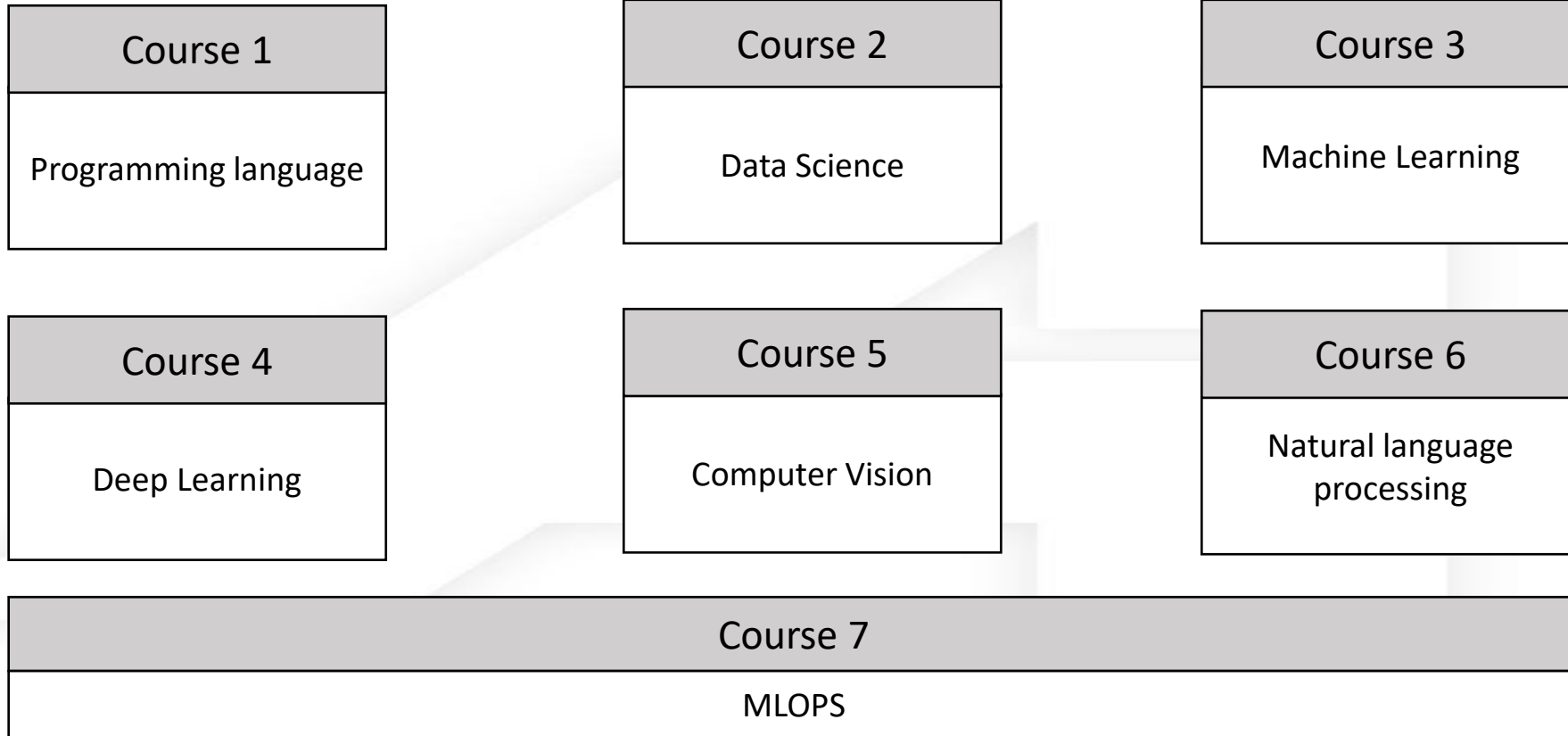
Session 1: Setup Environment & Python Basics

Agenda:

1	Introduction To Diploma
2	Software Required
3	Introduction to python
4	Python basics syntax, comments
5	data types (one : one)
6	Print statement
7	User inputs

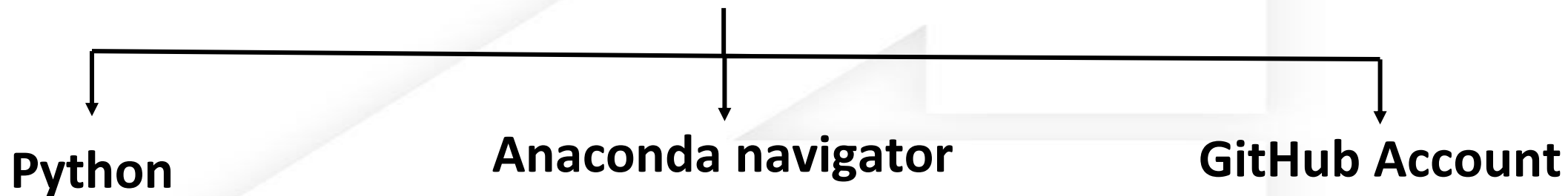
1. Introduction To Machine Learning AI Diploma

Machine Learning & AI Diploma



2. Software Required

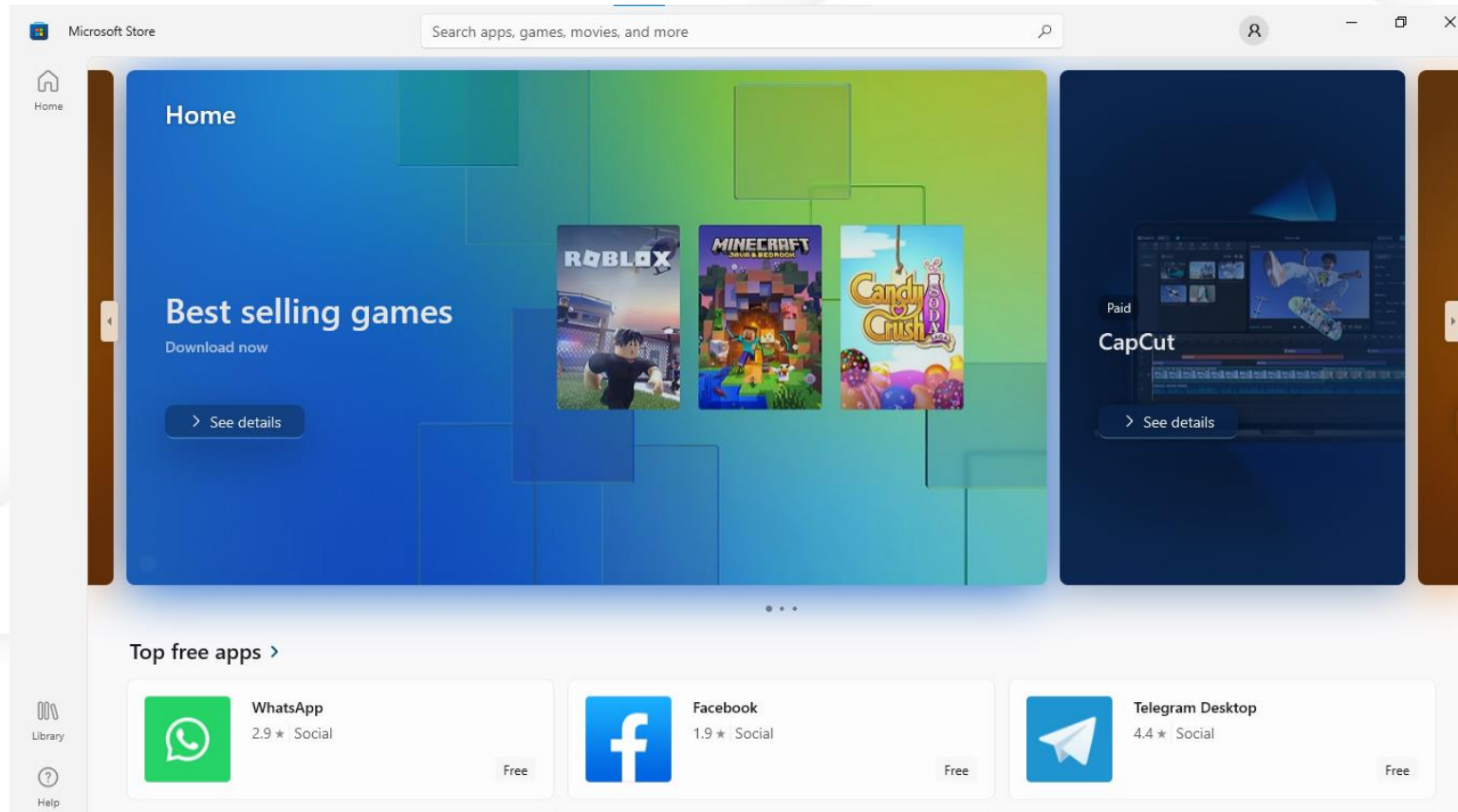
Software Required



How To Download Python

Step 1

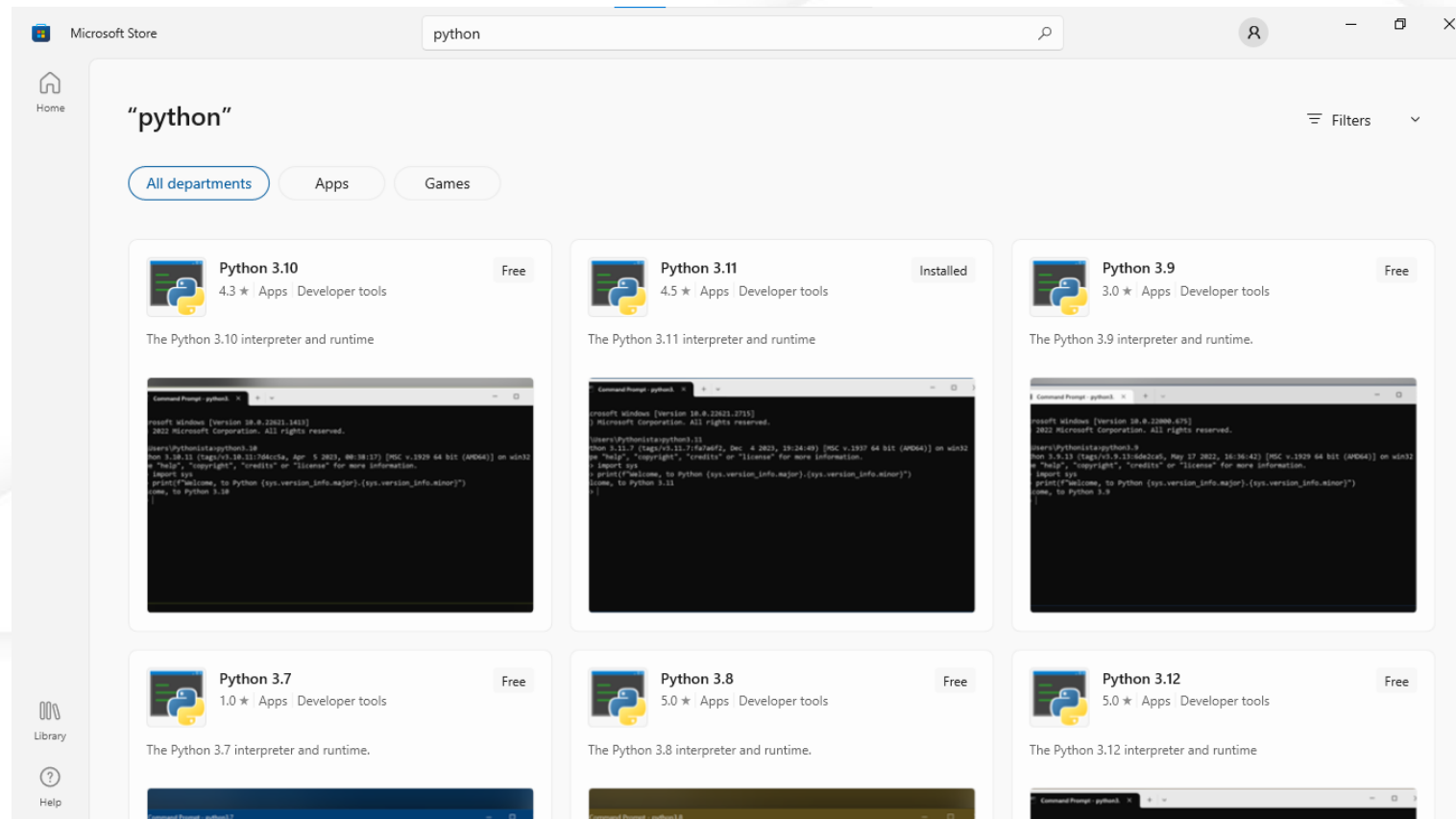
Open Microsoft store



How To Download Python

Step 2

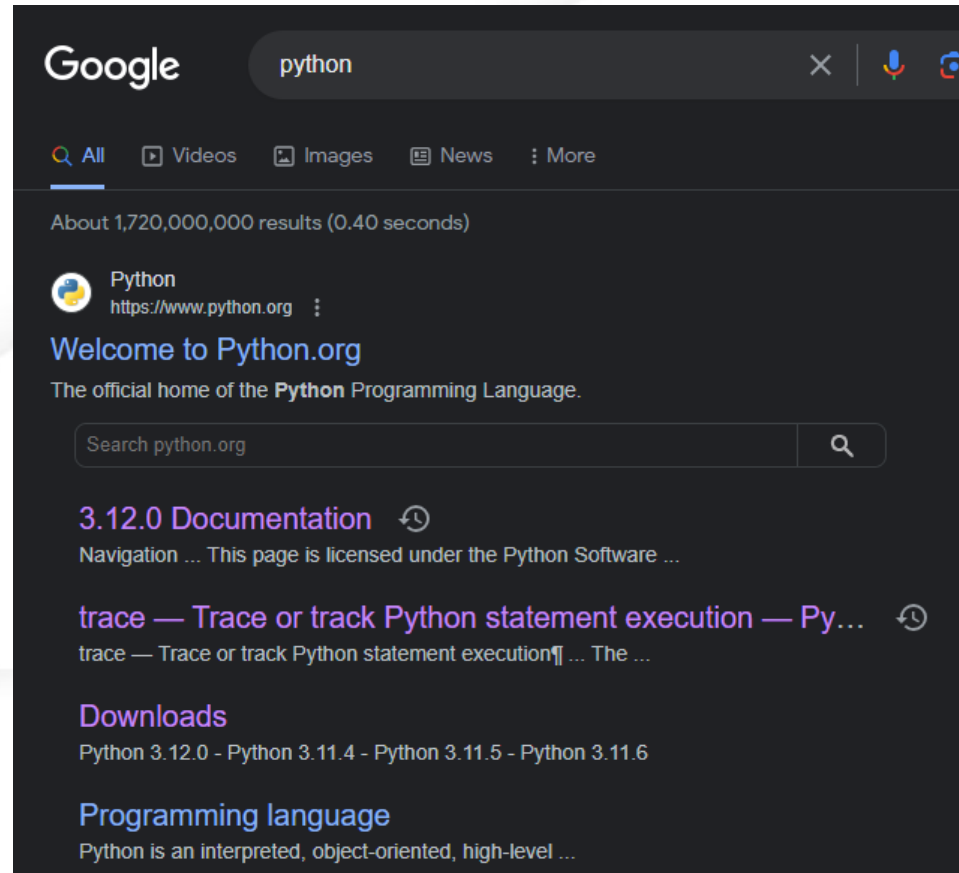
Search python and download any python 3 or above



How To Download Python

Step 1

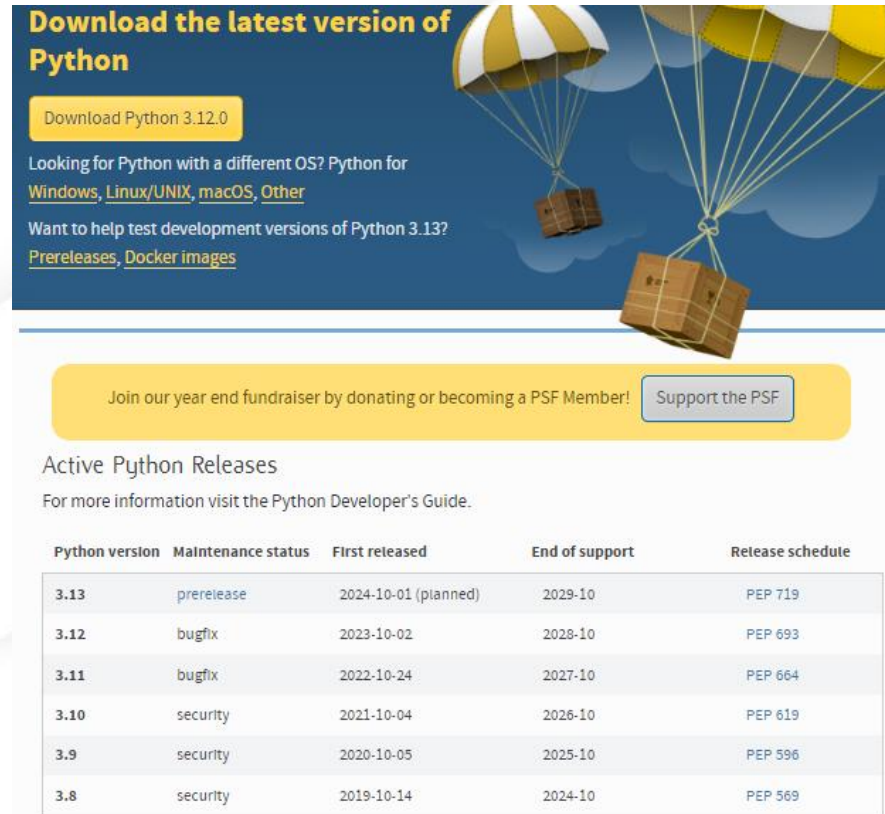
Search Python on Google



How To Download Python

Step 2

Choose the appropriate version based on your Windows operating



Download the latest version of Python

[Download Python 3.12.0](#)

Looking for Python with a different OS? Python for [Windows](#), [Linux/UNIX](#), [macOS](#), [Other](#)

Want to help test development versions of Python 3.13? [Prereleases](#), [Docker images](#)

Join our year end fundraiser by donating or becoming a PSF Member! [Support the PSF](#)

Active Python Releases

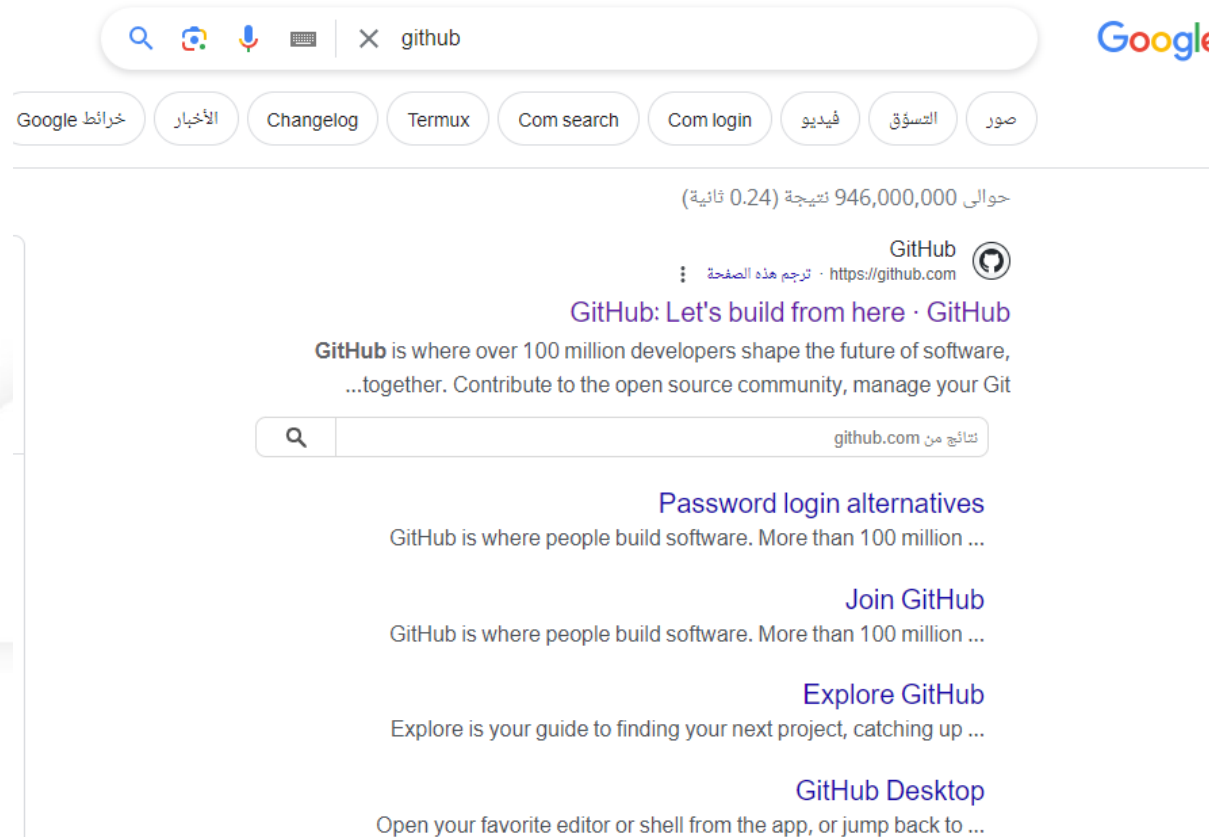
For more information visit the [Python Developer's Guide](#).

Python version	Maintenance status	First released	End of support	Release schedule
3.13	prerelease	2024-10-01 (planned)	2029-10	PEP 719
3.12	bugfix	2023-10-02	2028-10	PEP 693
3.11	bugfix	2022-10-24	2027-10	PEP 664
3.10	security	2021-10-04	2026-10	PEP 619
3.9	security	2020-10-05	2025-10	PEP 596
3.8	security	2019-10-14	2024-10	PEP 569

How To Download GitHub

Step 1

Search GitHub on Google



The screenshot shows a Google search interface. At the top, there's a search bar with the text 'github' and a magnifying glass icon. To the right of the search bar is the Google logo. Below the search bar, there are several buttons: 'Google', 'الأخبار', 'Changelog', 'Termux', 'Com search', 'Com login', 'فيديو', 'التسوق', and 'صور'. Below these buttons, there's a line of text: 'حوالي 946,000,000 نتيجة (0.24 ثانية)'. Below this, there's a search result for GitHub. The result includes the GitHub logo, the text 'GitHub: Let's build from here · GitHub', and a description: 'GitHub is where over 100 million developers shape the future of software, ...together. Contribute to the open source community, manage your Git'. Below the description, there's a search bar with the text 'تائج من github.com'. Below the search bar, there are four links: 'Password login alternatives', 'Join GitHub', 'Explore GitHub', and 'GitHub Desktop'. Each link has a short description below it.

GitHub

GitHub: Let's build from here · GitHub

GitHub is where over 100 million developers shape the future of software, ...together. Contribute to the open source community, manage your Git

تائج من github.com

Password login alternatives

GitHub is where people build software. More than 100 million ...

Join GitHub

GitHub is where people build software. More than 100 million ...

Explore GitHub

Explore is your guide to finding your next project, catching up ...

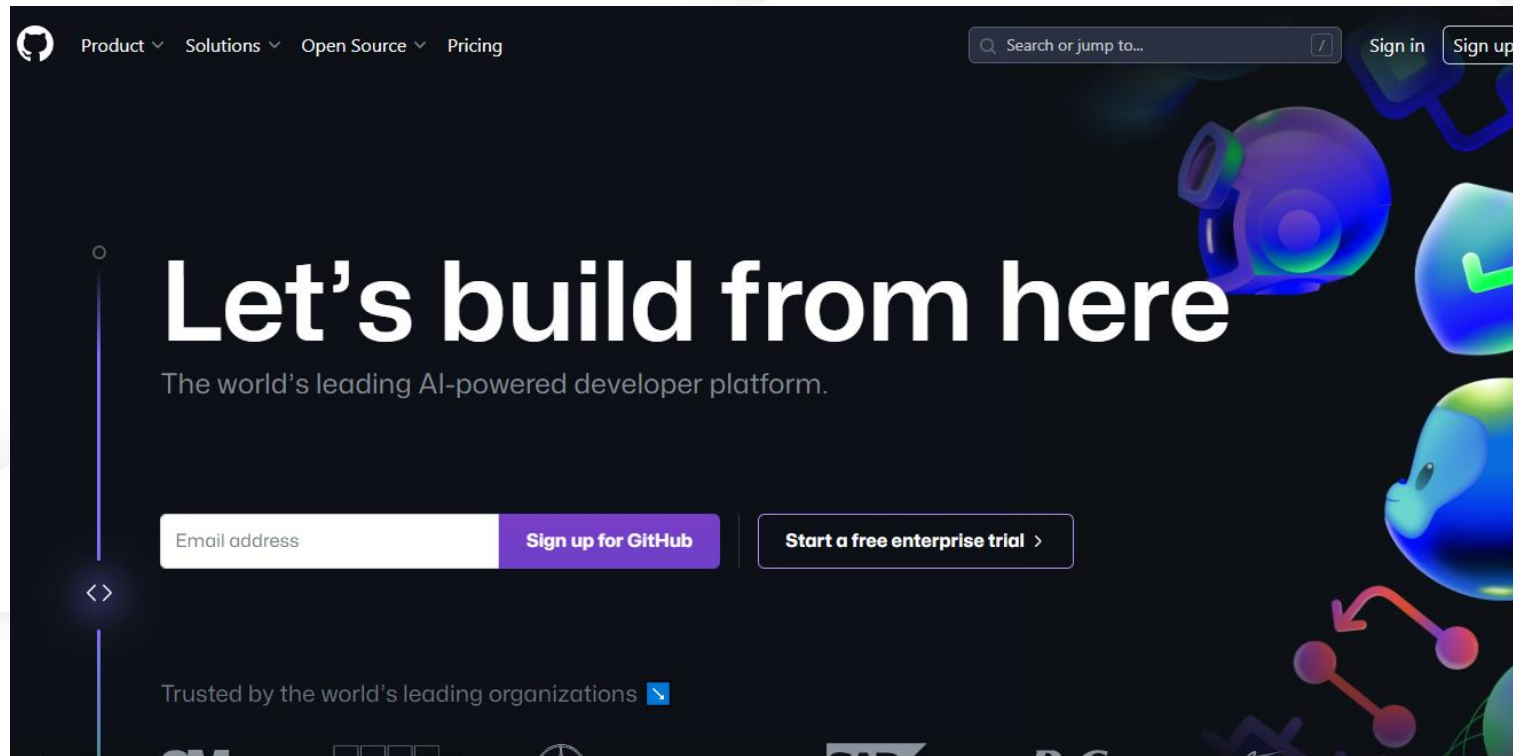
GitHub Desktop

Open your favorite editor or shell from the app, or jump back to ...

How To Download GitHub

Step 2

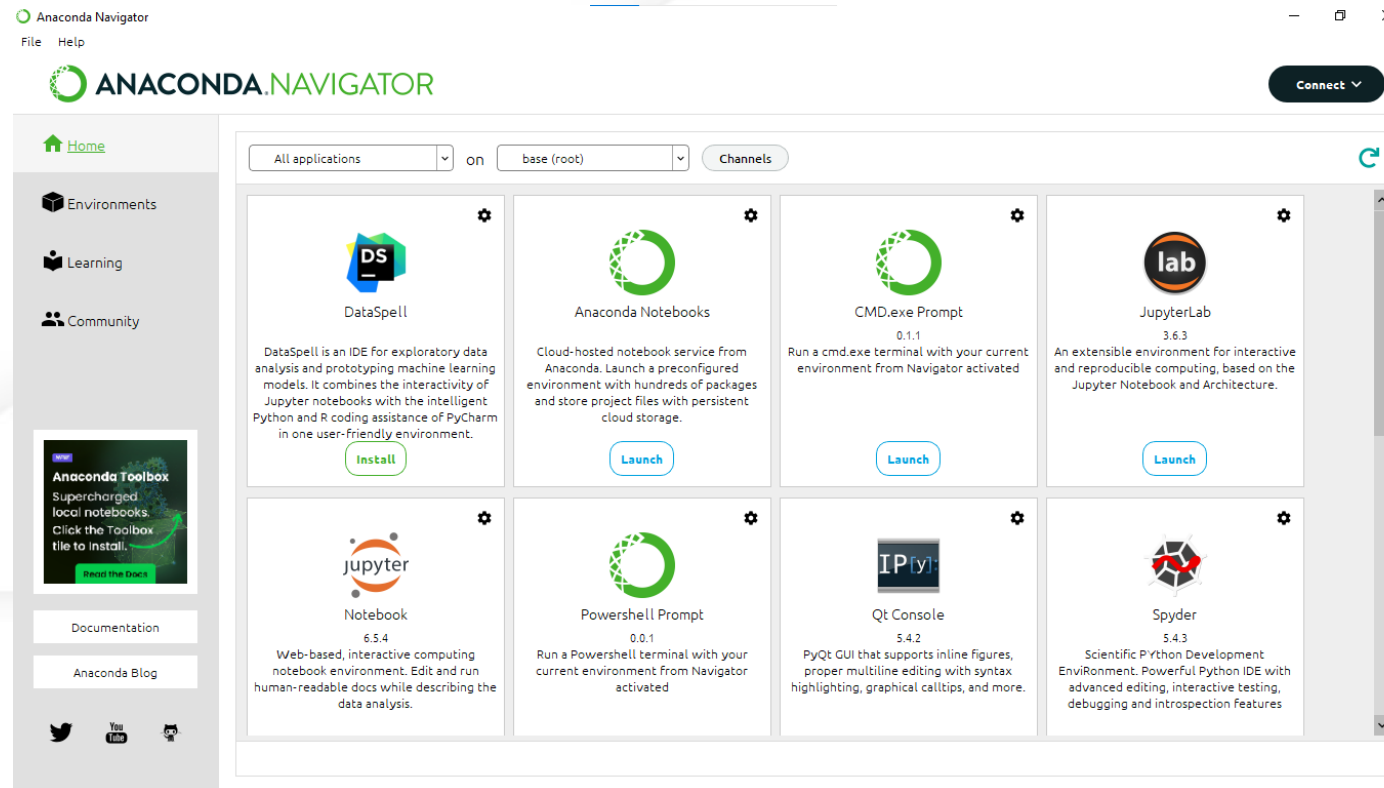
Click on Sign Up' to Create GitHub Account



How To Use Anaconda Navigator & Open Jupyter Notebook

Step 1

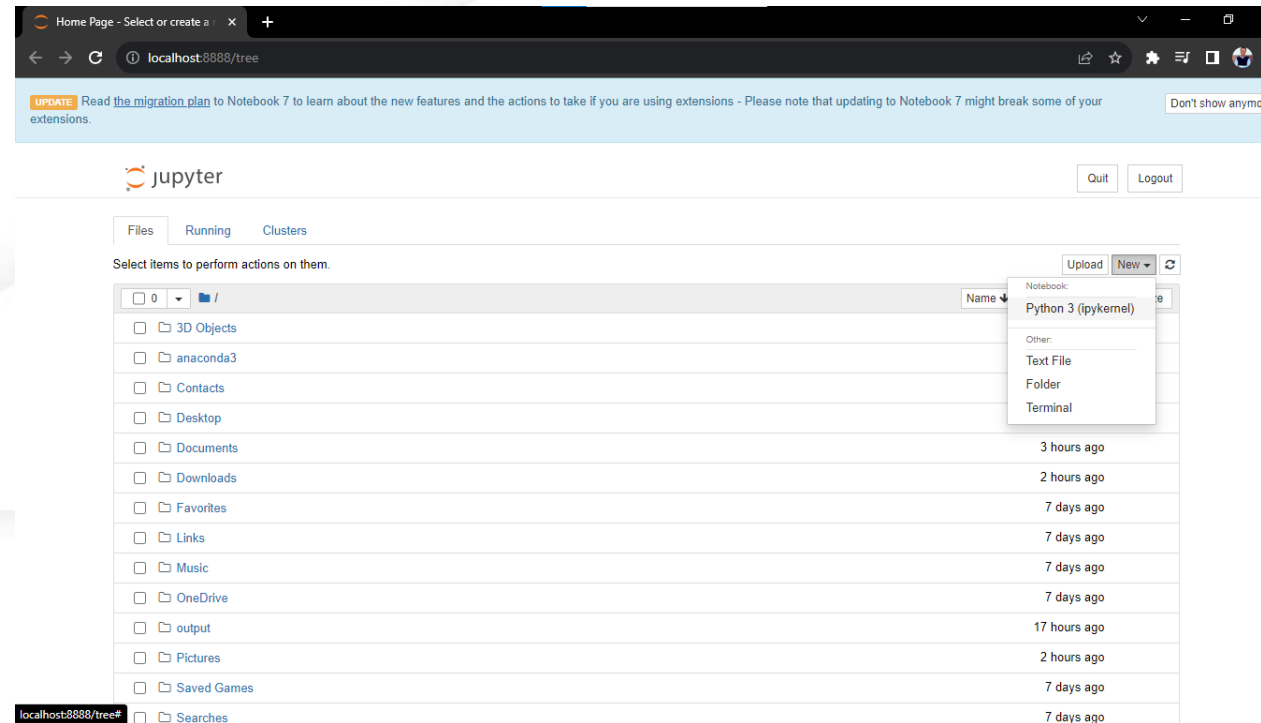
Launch Anaconda Navigator and choose Jupyter Notebook from the options.



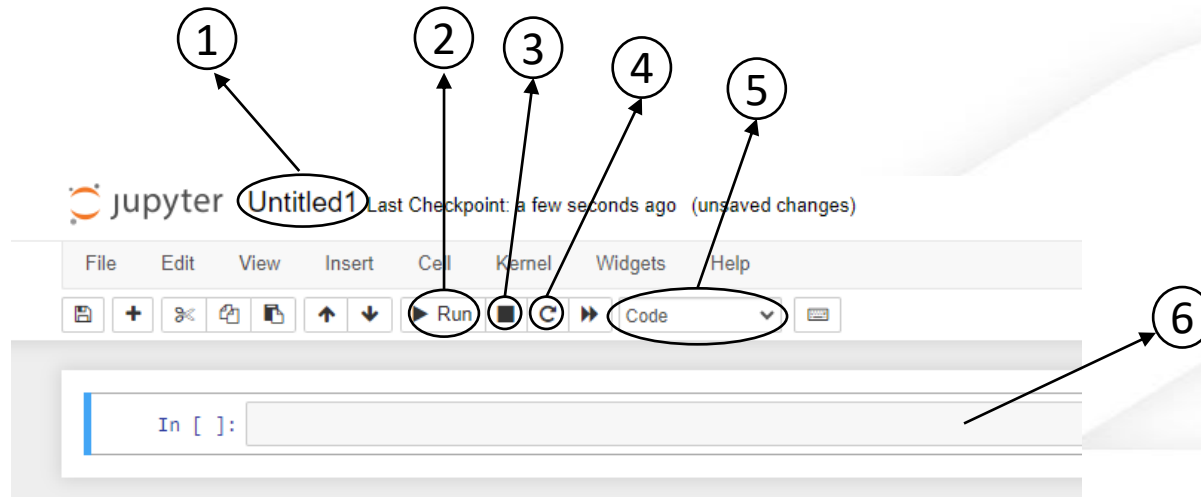
How To Use Anaconda Navigator & Open Jupyter Notebook

Step 2

Click on 'New' and then select 'Python 3' to open Jupyter Notebook.



How To Use Jupyter Notebook



1. Notebook Title

2. Run Cell

3. Select the 'Cell' option and choose between 'Code' and 'Markdown'.

4. Interrupt Cell

5. Restart Cell

6. Cell

Shortcuts

Select cell + press a => create Cell above your Cell

Select cell + press b => create Cell below your Cell

Select cell + press x => delete Cell above your Cell

Select cell + press c => copy your Cell

Select cell + press v => past your Cell

How To Use GitHub

Create Repository

Step 1

Press your profile picture

Step 2

Choose your repositories

Step 3

Press new

Step 4

Enter Repository Name and make sure your repository is public and add readme file

Step 5

Press create repository

Delete Repository

Step 1

Select Settings

Step 2

Scroll Down and Select Delete this repository

Upload File in Repository

Step 1

Select Add File and Upload Files

Step 2

Select Choose your Files

Delete File in Repository

Step 1

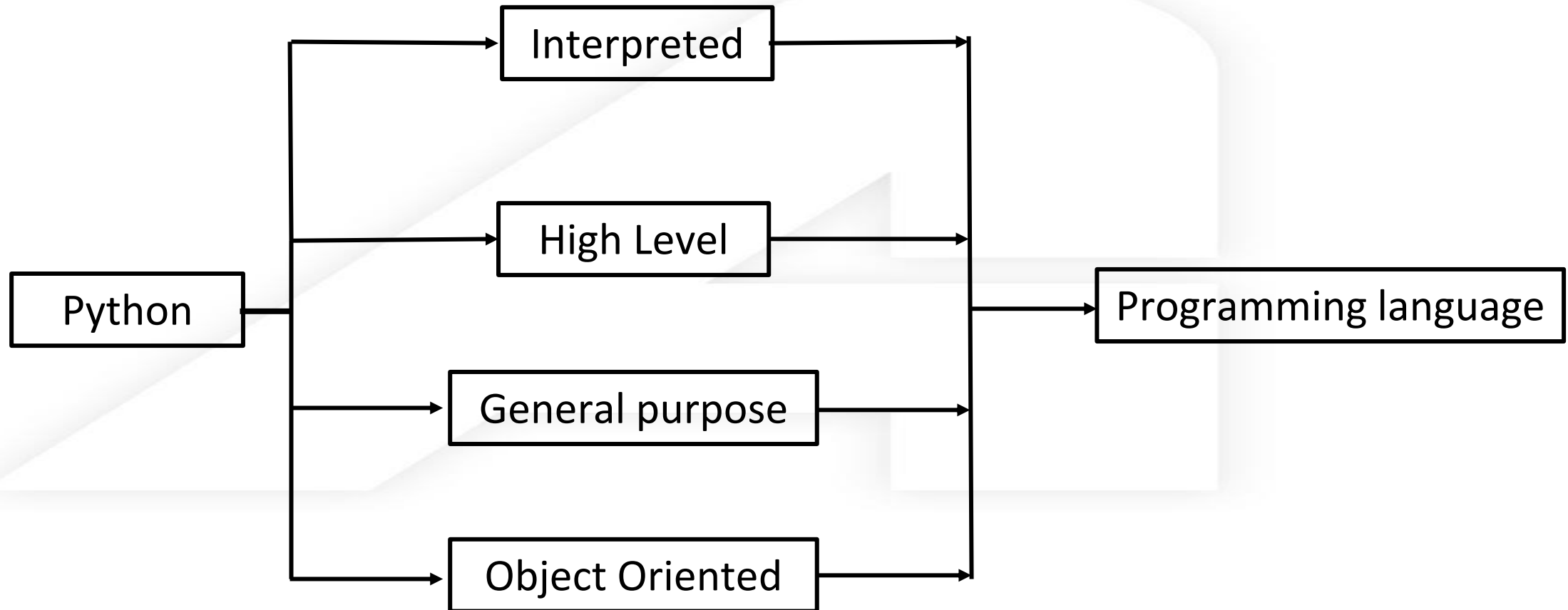
Select File

Step 2

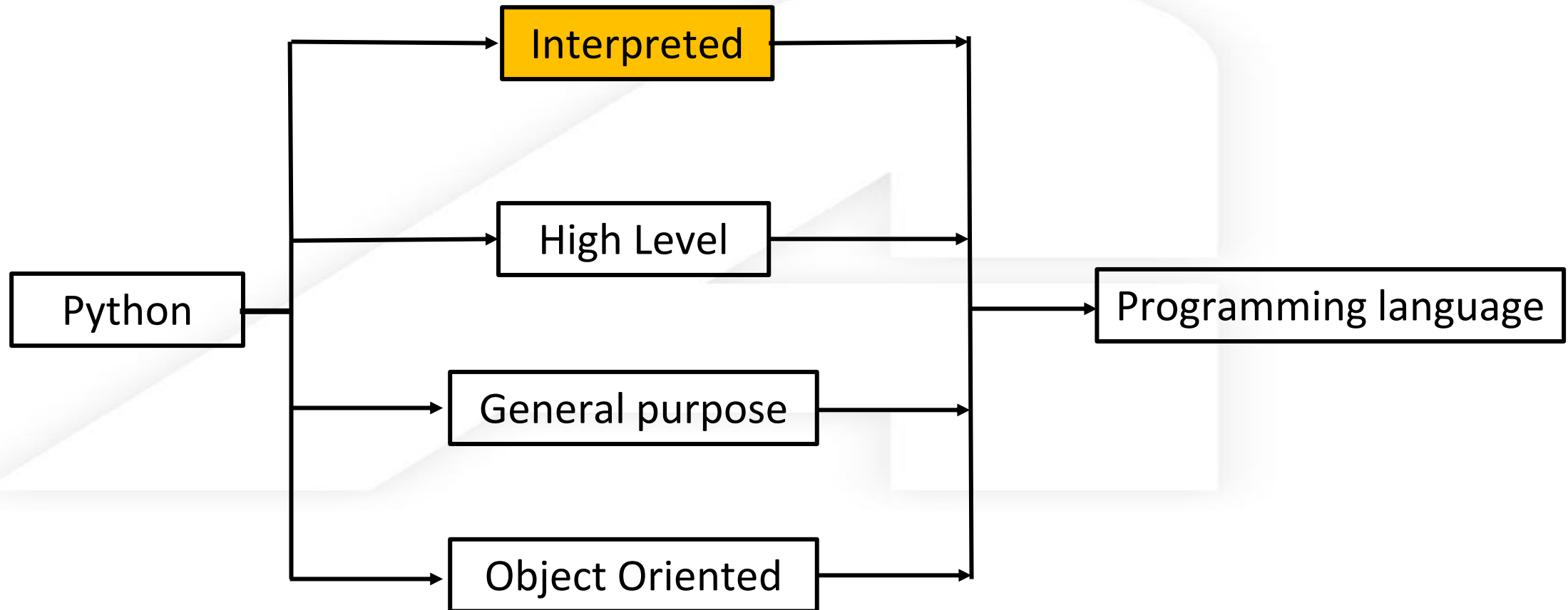
Press (...) & Choose Delete File

3. Introduction to python

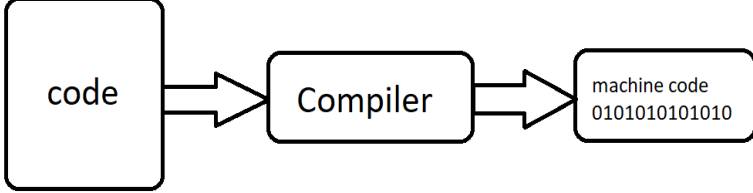
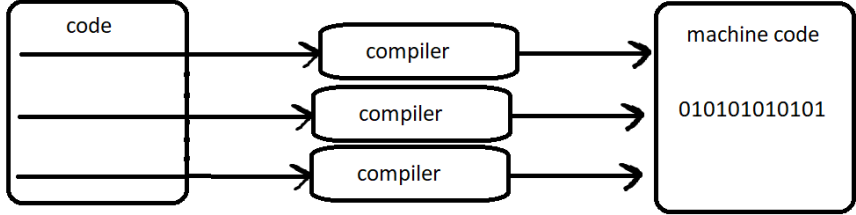
What is Python ?



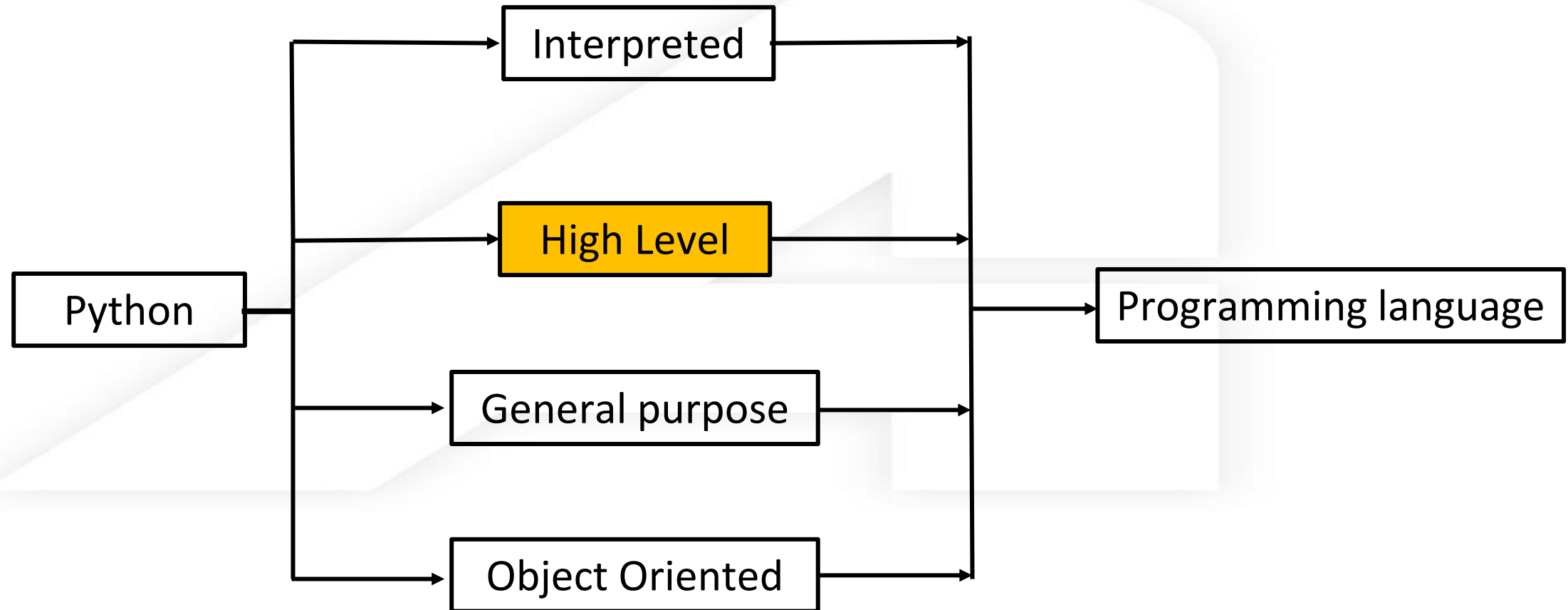
What is Python ?



Types Of Programming languages

	Compiled programming language	Interpreted programming languages
Compilation Process	<p>Code is translated into machine code or an intermediate code by a compiler before execution.</p>  <pre>graph LR; code[code] --> Compiler[Compiler]; Compiler --> machine_code[machine code
0101010101010];</pre>	<p>Code is translated and executed line by line by an interpreter during runtime.</p>  <pre>graph LR; code[code] --> compiler1[compiler]; code --> compiler2[compiler]; code --> compiler3[compiler]; compiler1 --> machine_code[machine code
010101010101]; compiler2 --> machine_code; compiler3 --> machine_code;</pre>
Execution Speed	Generally faster execution as the entire code is translated into machine code beforehand.	Generally slower compared to compiled languages.
Debugging	Errors are detected during the compilation process, making debugging more challenging.	Errors are identified during runtime, making it easier to pinpoint and fix issues.
Memory Usage	more efficient memory usage	May result in less optimized memory usage compared to compiled languages
Example	C , C++ , C#	Python , Ruby

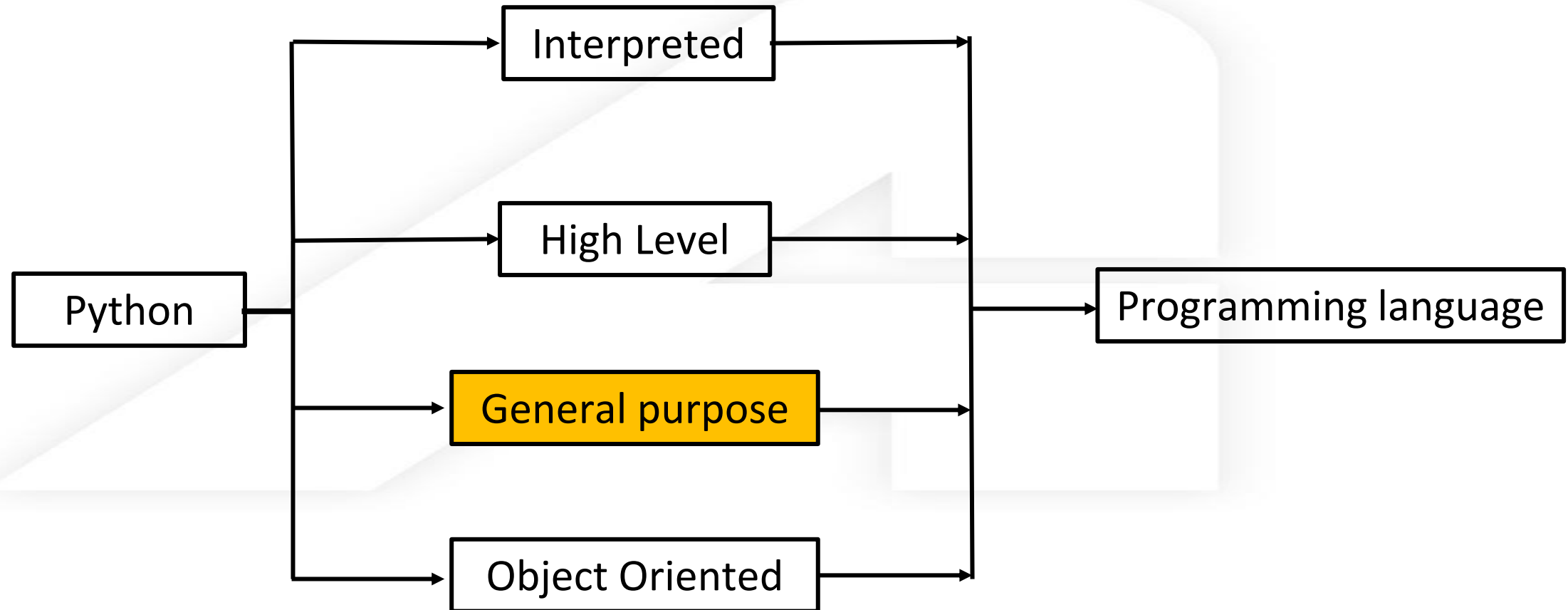
What is Python ?



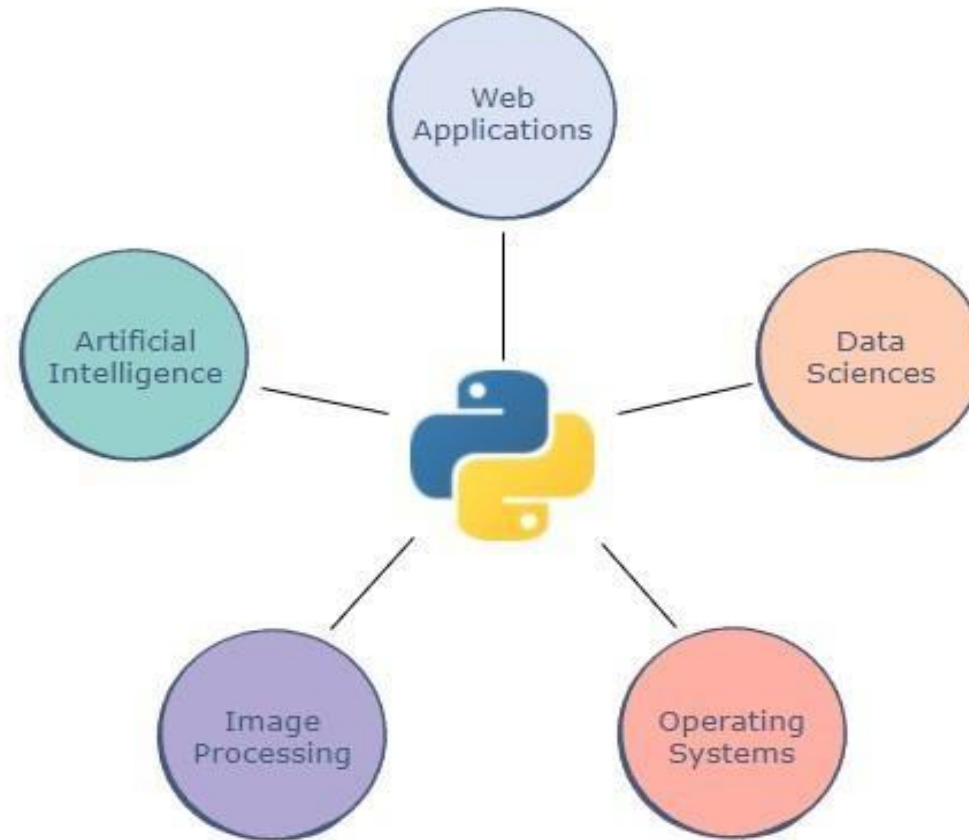
What is Python ?

Programming languages Levels		
	Low Level Language	High level language
Definition	<ul style="list-style-type: none">- These languages are like talking directly to the computer's hardware.- They're a basic set of instructions that the computer easily understands.	<ul style="list-style-type: none">- programming language that's easier for humans to understand.- They use words and structures that resemble everyday language, making programming more user-friendly.
Example	assembly languages and machine code.	Python , Java, C++, Ruby, Swift

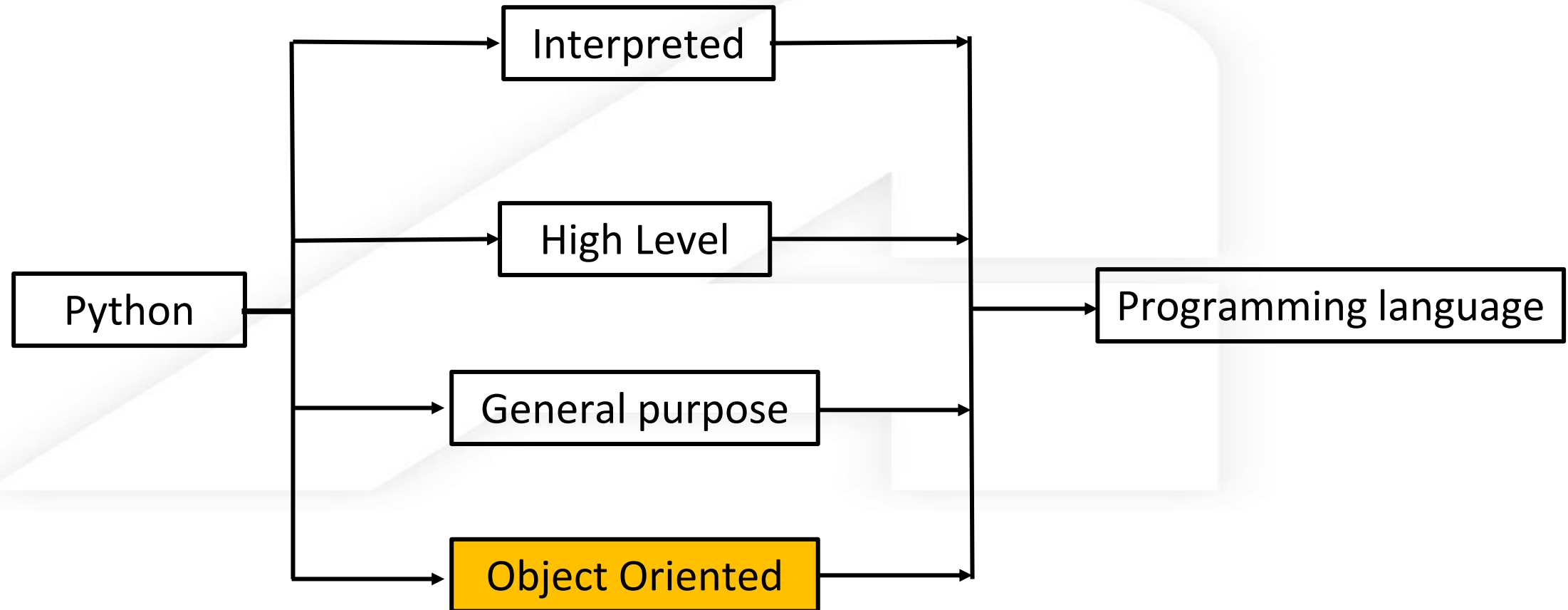
What is Python ?



What is Python ?



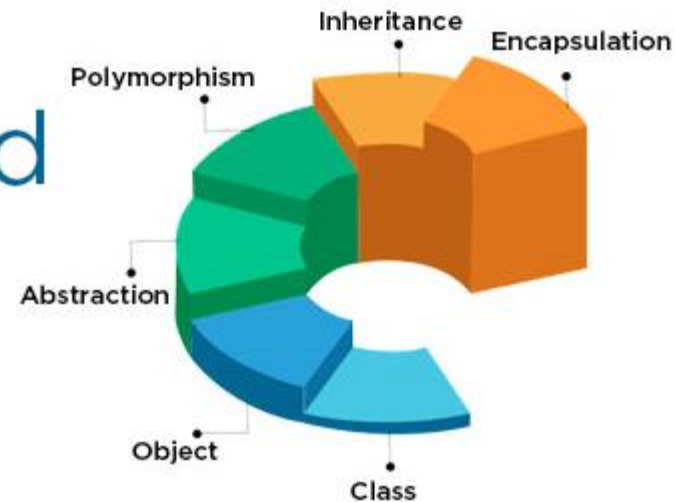
What is Python ?



Object-oriented programming (OOP)

Python is a great programming language that supports Object-oriented programming (OOP), OOP is a way of computer programming using the idea of “objects” to represents data and methods.

Object Oriented
Programming
with Python

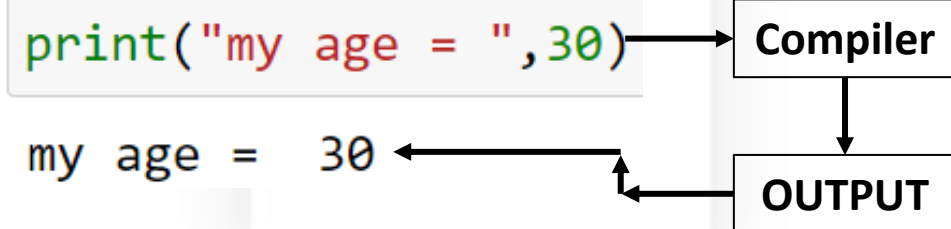
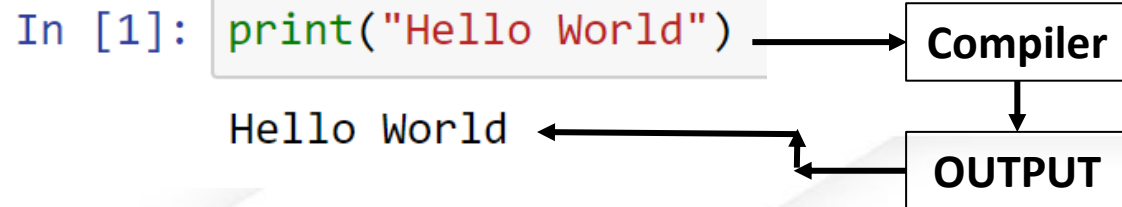


3. Python Basics

Print() Function

The print() function in Python is a **built-in function** that displays information on the screen.

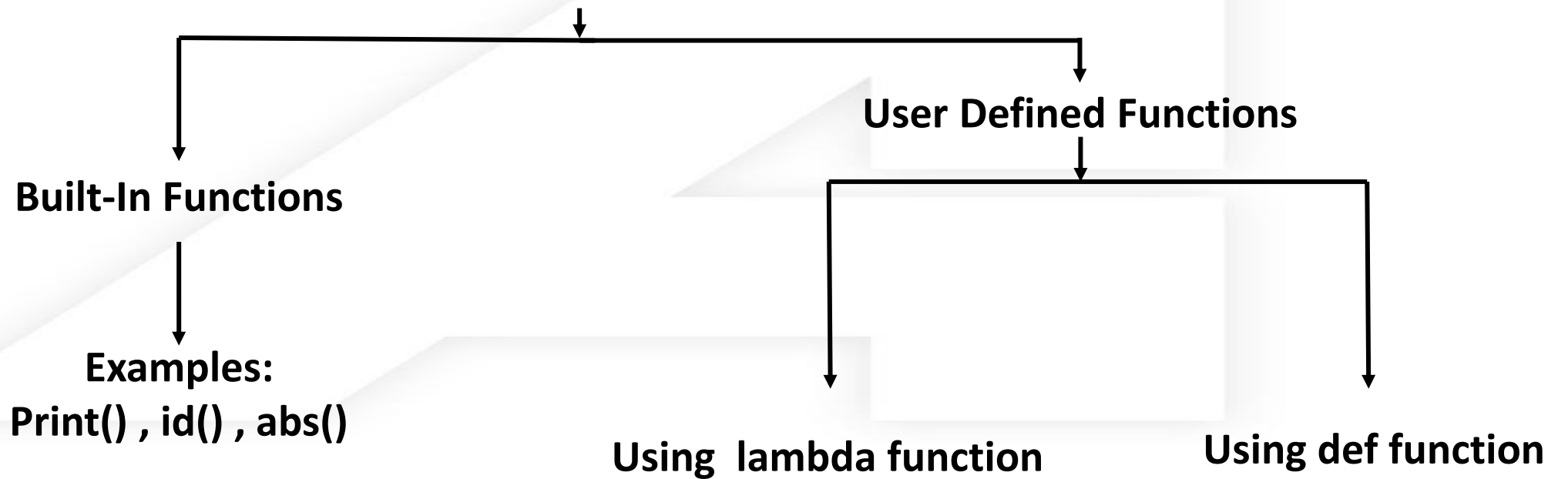
What is functions



What is function

Functions in Python are blocks of reusable code that perform specific tasks.

Main Types Of functions



Comment:

Comments in Python are text annotations within the code that are ignored during execution, providing explanations or notes for better understanding.

You can insert single-line comments using '#' and multi-line comments using triple single quotes ('''').

comment

```
print("hello world")  
print("amit learning")
```

```
hello world  
amit learning
```

```
print("hello world")  
#print("amit Learning")
```

```
hello world
```

OUTPUT

```
...  
print("hello world")  
print("hello world")  
print("hello world")  
print("hello world")  
print("hello world")  
print("hello world")  
...  
print("amit learning")
```

```
amit learning
```

OUTPUT

Try To Solve

What should be the expected output of the provided code?

```
'''  
print("amit")  
print("learning")  
print("python")  
'''  
  
print("machine learning")  
  
#print("deep learning")  
#print("data science")  
#print("python")
```

Try To Solve

What should be the expected output of the provided code?

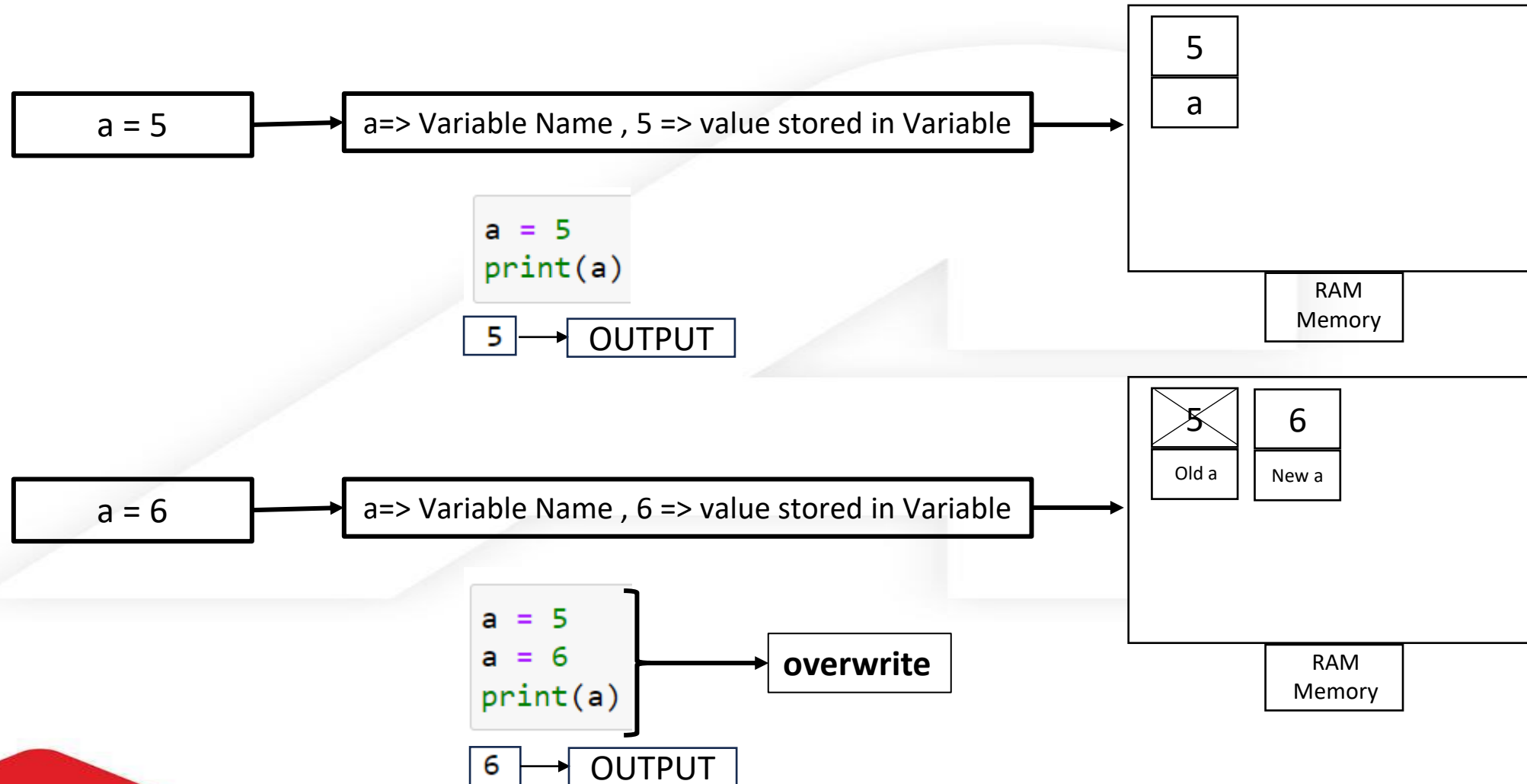
```
'''  
print("amit")  
print("learning")  
print("python")  
'''  
  
print("machine learning")  
  
#print("deep learning")  
#print("data science")  
#print("python")
```

Answer:

- machine learning

3. Python Variables

Python Variables

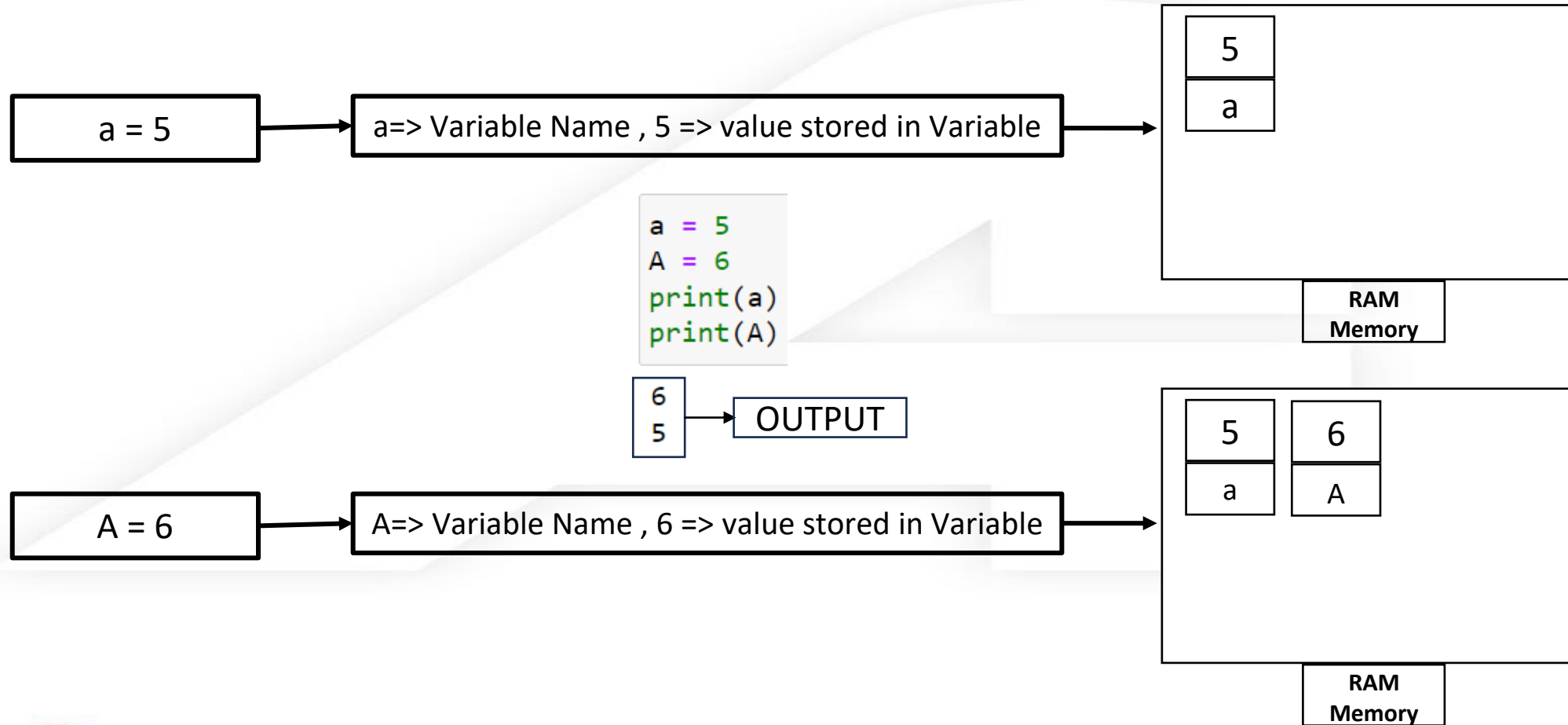


PYTHON IDENTIFIERS

1. Python identifiers are user-defined names for variables, functions, classes, or objects in code.
2. Guidelines for creating identifiers include using letters (uppercase and lowercase), numbers, and underscores.
3. Special characters and operators are not allowed in identifiers.
4. Identifiers should not begin with a number, and certain keywords are reserved and cannot be used as standalone identifiers.
5. Meaningful names for identifiers are encouraged.
6. **Python is case-sensitive**, distinguishing between uppercase and lowercase identifiers.
7. Avoid using 'l', 'I', or 'O' as single-character variable names due to potential font-related confusion.

Class names	Variable names / Methods / Functions / Arguments / Globals	Constants
PascalCase	snake_case	FULLY CAPITALIZED

Python Variables



How To Print value of Variable Inside String

Format function

format function in strings helps you put variables into a text by using curly braces {} as placeholders. You can replace these placeholders with actual values when using the format function, making your text dynamic and customized.

format

```
print("my name is {0} , my age is {1}".format("amit",30))  
print("my name is {} , my age is {}".format("amit",30))  
print("my name is {x} , my age is {y}".format(x = "amit",y = 30))
```

```
my name is amit , my age is 30  
my name is amit , my age is 30  
my name is amit , my age is 30
```

```
name = "amit"  
age = 30  
print(f"my name is {name}, my age is {age}")
```

```
my name is amit, my age is 30
```

Try To Solve

Create a Python script to display personalized information. Utilize variables to store the user's name, age, and the name of the course they are learning. Dynamically generate a message that includes this information and print the result. Ensure clarity in your code implementation without relying on user input.

Expected Output:

My name is {your_name}, and I am {your_age} years old. I am engaged in learning {course_name}.

Try To Solve

Create a Python script to display personalized information. Utilize variables to store the user's name, age, and the name of the course they are learning. Dynamically generate a message that includes this information and print the result. Ensure clarity in your code implementation without relying on user input.

Answer:

```
your_name = "amit learning"
your_age = 25
course_name = "machine learning and AI diploma"

output_text = f"My name is {your_name}, and I am {your_age} years old. I am engaged in learning {course_name}."

print(output_text)
```

4. Python Data Types

Python Data Types

One variable : One Data

Integer	Float	String	Boolean
whole number without a decimal point.	numeric data type that represents real numbers and can include a decimal point.	sequence of characters, enclosed within single or double quotes, used to represent text data.	binary data type representing either True or False

One variable : Many Data

List	Tuple	Set	Dictionary
<ol style="list-style-type: none"> 1. Data ordered 2. Changeable Data 3. Allow Duplicate Data 4. List can be represented by [] 5. Can be nested among all 6. Convert any datatype to list using List() function 	<ol style="list-style-type: none"> 1. Data ordered 2. Unchangeable Data 3. Allow Duplicate Data 4. Tuple can be represented by () 5. Can be nested among all 6. Convert any datatype to tuple using tuple() function 	<ol style="list-style-type: none"> 1. Data unordered 2. Unchangeable Data 3. Not allow Duplicate Data 4. Tuple can be represented by { } 5. Can be nested among all 6. Convert any datatype to set using set() function 	<ol style="list-style-type: none"> 1. Data ordered 2. Changeable Data 3. Not allow Duplicate for keys 4. Dictionary can be represented by { } 5. Can be nested among all 6. Convert any datatype to dictionary using dict() function

Type() function:

used to determine the data type of a variable or value.

Examples:

integer

In [11]:

```
x = 5  
print(type(x))
```

<class 'int'>

float

In [12]:

```
x = 5.5  
print(type(x))
```

<class 'float'>

string

In [13]:

```
x = "amit learning"  
print(type(x))
```

<class 'str'>

boolean

In [14]:

```
x = True  
print(type(x))
```

<class 'bool'>

List

In [15]:

```
x = [1,2.5,3.1,4.25,"amit",True]  
print(type(x))
```

<class 'list'>

Tuple

In [16]:

```
x = (1,2.5,3.1,4.25,"amit",True)  
print(type(x))
```

<class 'tuple'>

Set

In [17]:

```
x = {1,2.5,3.1,4.25,"amit",True}  
print(type(x))
```

<class 'set'>

Dictionary

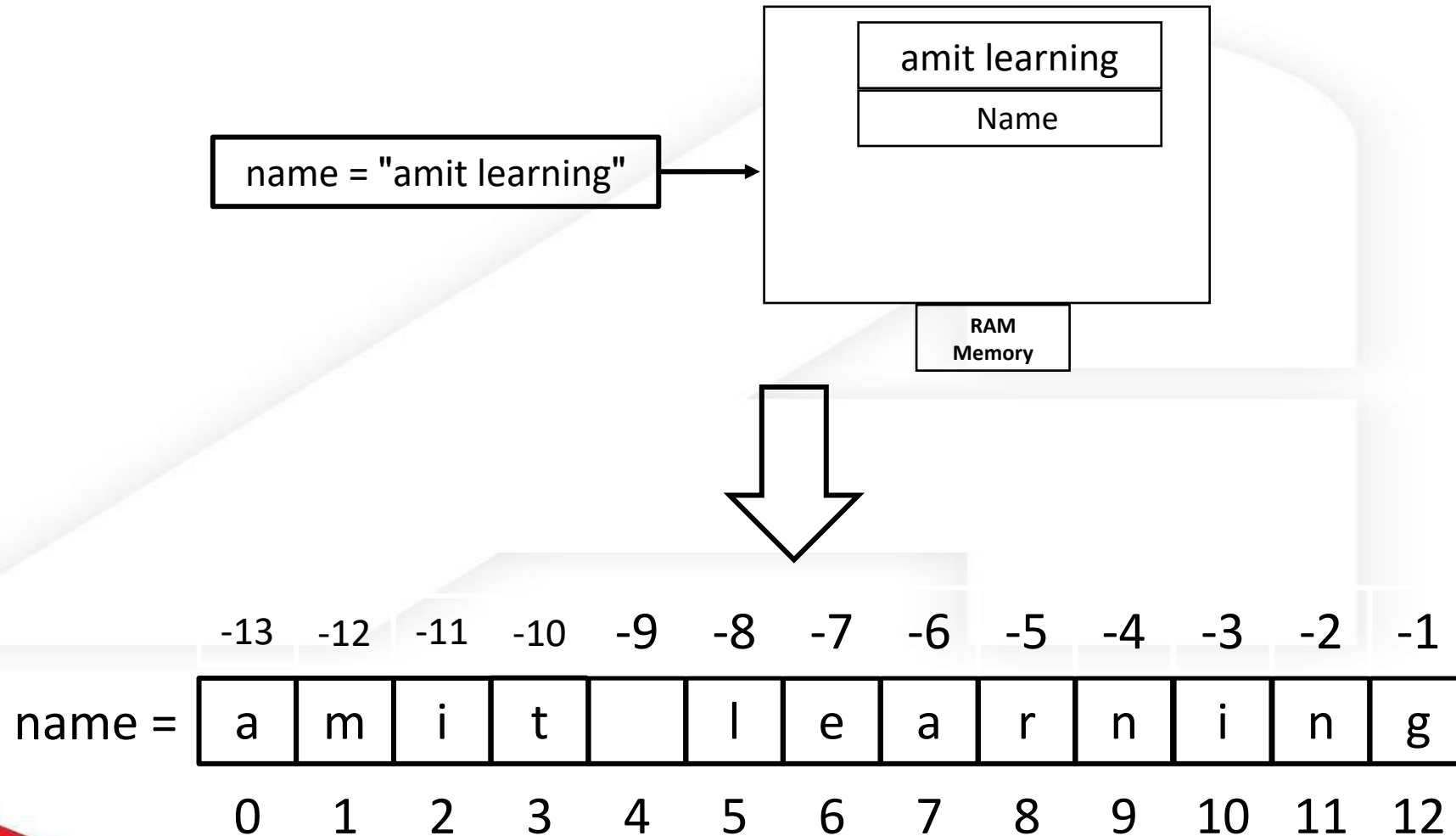
In [18]:

```
x = {"key1":"value1","key2":"value2"}  
print(type(x))
```

<class 'dict'>

String

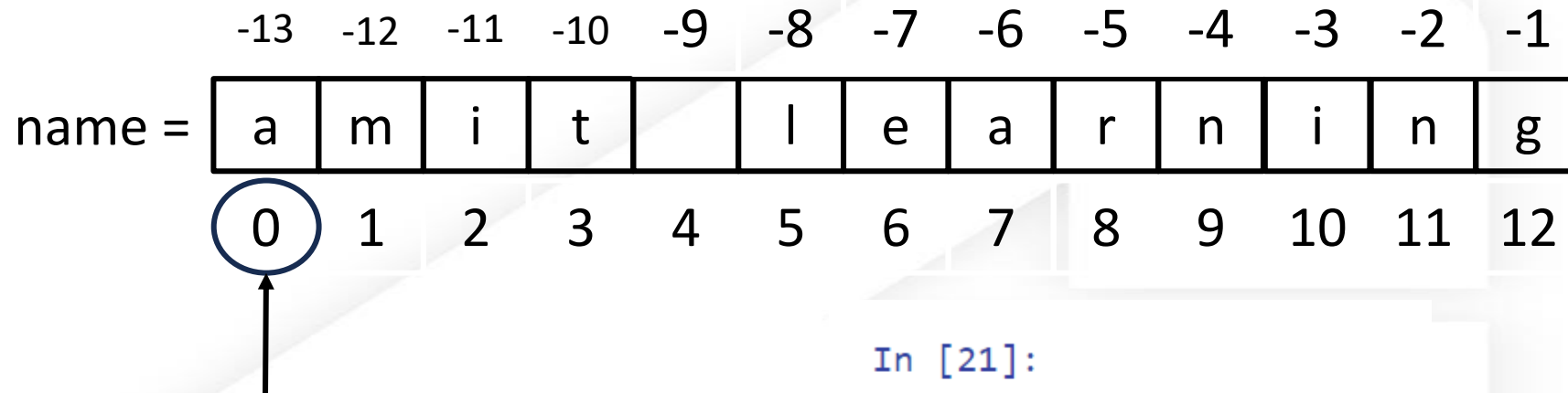
How String Stored in Memory



In [20]:

```
name = "amit learning"  
print(name[0])
```

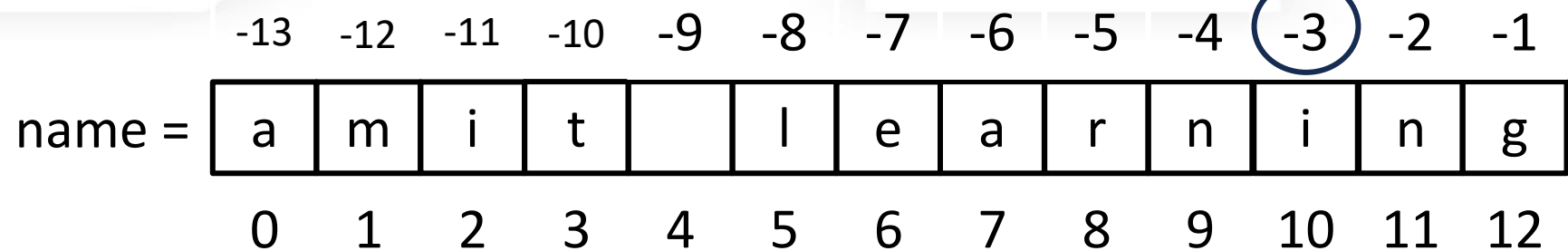
a



In [21]:

```
print(name[-3])
```

i



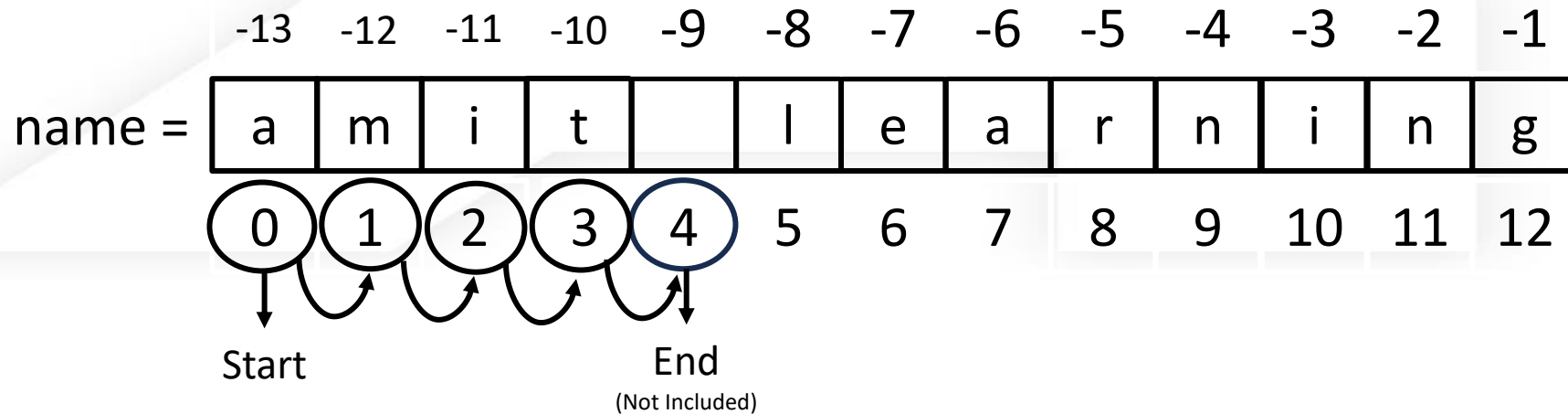
String Slicing

```
print(variable_name[start index: end index: step])
```

```
In [22]:
```

```
name = "amit learning"  
print(name[0:4:1])
```

```
amit
```



Functions to Strings

upper function

```
name = "amit learning"  
print(name.upper())
```

AMIT LEARNING

Upper Function

converts all the letters in a string to uppercase, making the entire string capitalized.

lower function

```
name = "AMIT LEARNING"  
print(name.lower())
```

amit learning

lower Function

converts all the letters in a string to lowercase, transforming the entire string to its lowercase form.

replace function

```
name = "amit learning"  
print(name.replace("amit", "hello"))
```

hello learning

replace Function

used to replace a specified substring or character in a string with another substring, creating a modified version of the original string.

capitalize function

```
name = "amit learning"  
print(name.capitalize())
```

Amit learning

capitalize Function

The capitalize() function in Python is used to capitalize the first letter of a string, converting the rest of the characters to lowercase if applicable.

Functions to Strings

Title function

```
name = "amit learning"  
print(name.title())
```

Amit Learning

Title Function

used to convert the first character of each word in a string to uppercase,

swapcase function

```
name = "amit LEarning"  
print(name.swapcase())
```

AMIT leARNING

Swapcase Function

used to swap the case of each character in a string, converting uppercase letters to lowercase and vice versa.

count function

```
name = "amit learning amit learning"  
print(name.count("amit"))
```

2

Count Function

used to count the number of occurrences of a specified substring or character within a string

split function

```
name = "amit learning amit learning"  
print(name.split())
```

['amit', 'learning', 'amit', 'learning']

split Function

used to split a string into a list of substrings based on a specified delimiter.

Functions to Strings

join function

```
words = ["This", "is", "a", "sentence."]
sentence = ' '.join(words)
print(sentence)
```

This is a sentence.

Join Function

used to concatenate a sequence of strings with a specified separator, creating a single string.

startswith function

```
name = "amit learning amit learning"
print(name.startswith("Hello"))
```

False

startswith Function

used to check if a string starts with a specified prefix.

endwith function

```
name = "amit learning amit learning"
print(name.endswith("learning"))
```

True

endwith Function

used to check if a string ends with a specified suffix.

Escape Characters

Escape characters in Python are special codes (starting with \) used to represent hard-to-type characters or control the formatting of strings

new line

```
print("Hello\nWorld")
```

Hello
World

tab

```
print("Hello\tWorld")
```

Hello World

double quote

```
print("This is a double quote: \"hello\" ")
```

This is a double quote: "hello"

backspace

```
print("Hello\b")
```

Hell

Try To Solve

What is the output of the following code?

```
> my_string = "0123456789"  
> print(my_string[-2: -6: -2])
```

- ☐ 5432
- ☐ 8765
- ☐ 532
- ☐ 86

Try To Solve

What is the output of the following code?

```
> my_string = "0123456789"  
> print(my_string[-2: -6: -2])
```

- ☐ 5432
- ☐ 8765
- ☐ 532
- ☒ 86

Thank You