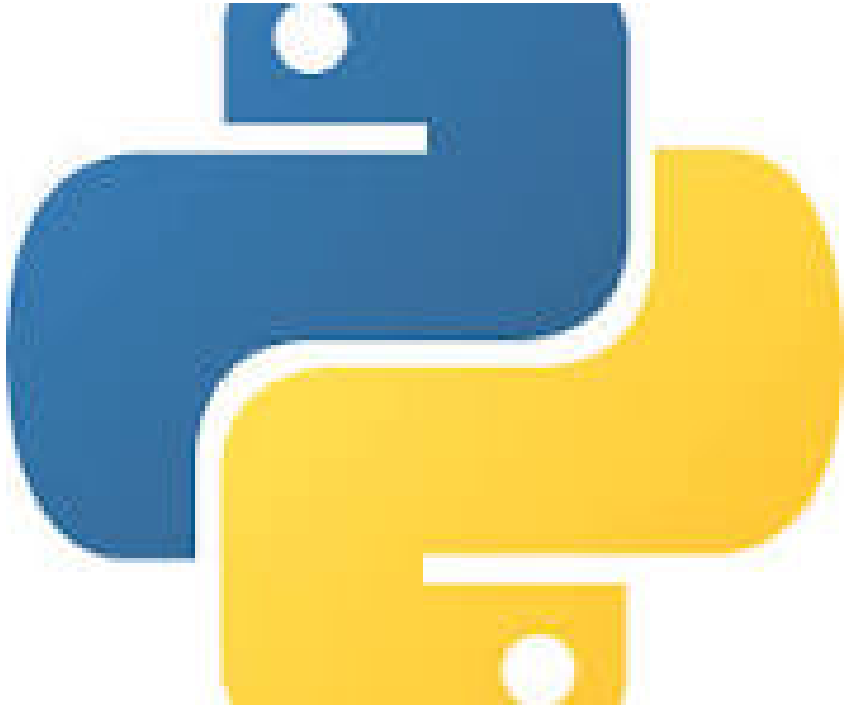

Python Programming

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Outline

- Introduction
- Programming
- Computer programming
- Python
- Feature of python
- Display statement
- variable
- Operators
- Data type
- Keyword

Introduction

- Program : is set of instruction that tells a Something to do something.
- Programming: a process of writing, debugging, executing and evaluating a program.
- it is telling a Something what to do.
- Being good at programming means you can make the something do what you want.
- is the process of creating a set of instructions for a something to follow to perform a specific task or solve a problem

Computer

- An Electronics device that perform an operation based on calculation.
- It derived from the word “compute” which means calculate.
- A computer is a device that can accept human instruction, processes it, and responds to it or a computer is a computational device that is used to process the data under the control of a computer program.
- It is a machine or device that perform an operation based on instruction or program with the help of electricity based on the following Sequence:-

Computer Programming

- Computer Program : is set of instruction that tells a Computer to do something.
- Computer Programming: a process of writing, debugging, executing and evaluating a Computer program.
- it is telling a Computer what to do.
- Being good at Computer programming means you can make the Computer do what you want.
- is the process of creating a set of instructions for a Computer to follow to perform a specific task or solve a problem

…Cont.

- Computer programming or coding is the composition of sequences of instructions, called programs, that computers can follow to perform tasks
- A person who writes a program is **Programmer**.
- **“If you haven't tried programming yet, it is recommended to try the concepts described here yourself as you move along, starting with either Python as your first programming language.**
- **Since the concepts are the same in all programming languages, you can learn the concepts first in one language, and then use the concepts you've learned in another programming language later”.**

Programming Languages

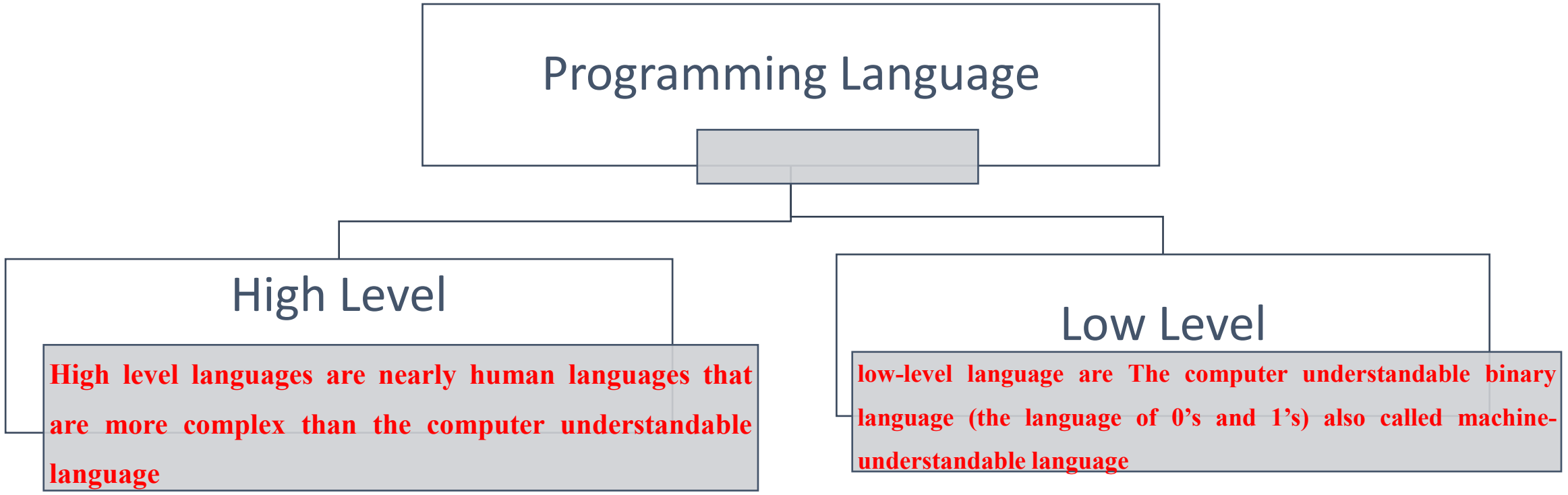
- Is a set of rule, style, standard, semantics, syntax to write ,debug,and execute program.
- A programming language is how we write code, what keywords we use, to tell the computer what to do.
- A programming language is a set of instructions and syntax used to create software programs.
- A programming language is a formal language that specifies a set of instructions for a computer to perform specific tasks.
- It's used to write software programs and applications, and to control and manipulate computer systems.

Some of the key features of programming languages

- ✓ **Syntax**: The specific rules and structure used to write code in a programming language.
- ✓ **Data Types**: The type of values that can be stored in a program, such as numbers, strings, and booleans.
- ✓ **Variables**: Named memory locations or container that can store values.
- ✓ **Operators**: Symbols used to perform operations on values, such as addition, subtraction, comparison, logical, conditional
- ✓ **Control Structures**: Statements used to control the flow of a program, such as if-else statements, loops, and function calls.
- ✓ **Libraries** and Frameworks: Collections of pre-written code that can be used to perform common tasks and speed up development.
- ✓ **Paradigms**: The programming style or philosophy used in the language, such as procedural, object-oriented, or functional.

...Cont.

- Programming language are written by high-level languages or low-level.



…Cont.

- Some of programming languages are:
- Python
- C++
- Javascript
- Java
- …

Introduction to Python

- one of the most popular programming languages.
- It’s one of the Example of high level Language.
- A high-level language, used in web development, data science, automation, AI and more.
- Backed by library support.
- Known for its readability, which means code is easier to write, understand and maintain.

Feature of Python

- Simple and easy to learn
- Interpreted language
- High level language
- Cross platform
- Open source
- Extensive standard library
- Object oriented
- Support multiple paradigm
- Portable
- Dynamic typing
- Scalable and extensive
- Widely used

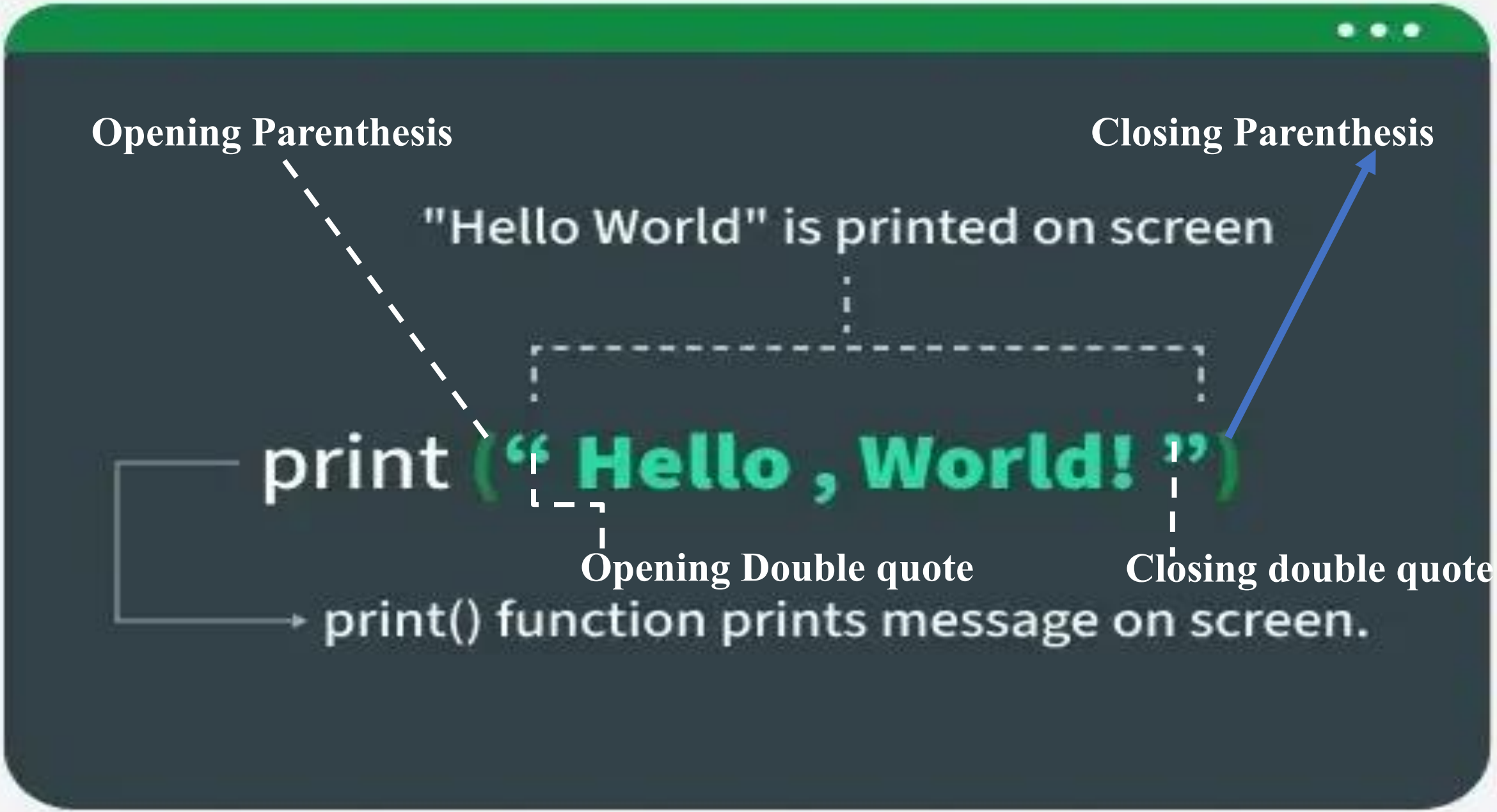
First Python Program

- Display statement : the first program of python is to display the result of statement or the string.
- Here is a simple Python code, printing a string Hello world.

print("Hello Python")

Output:

```
Hello Python
```


Opening Parenthesis
Closing Parenthesis
"Hello World" is printed on screen
print (" Hello , World! ")
Opening Double quote
Closing double quote
print() function prints message on screen.

Python Indentation

- refers to the spaces at the beginning of a code line.
- to indicate a block of code.
- It tells the Python interpreter that a group of statements belongs to a specific block.
- All statements with the same level of indentation are considered part of the same block.
- Indentation is achieved using whitespace (spaces or tabs) at the beginning of each line.
- The most common convention is to use 4 spaces or a tab, per level of indentation.

...Cont.

- Example :-

```
print("I have no indentation")

    print("I have tab indentaion")
```

Output

I have no indentation

```
  File "d:\Learning\Python\D14\data.py", line 80
    print("I have tab indentaion")
IndentationError: unexpected indent
```

Python Comment

- A piece of text that is not executed by the compiler.
- comments can be used to explain Python code.
- Comments can be used to make the code more readable.
- Comments can be used to prevent execution when testing code.
- In python comment can be creating by “#”
- Example:

```
#This is a comment
print("Hello, World!")
```

- On this, **This is comment** text is not displayed

Python Variable

- Variables are containers for storing data values.
- It is a memory location used to store values.
- is a name that is assigned to a value.
- is created the moment you first assign a value to it.
- No require data type explicitly for names variable.
- Example:

```
x = 5
y = "John“
```

...Cont.

- A process of Giving names for variables is **Variable Declaration** .
- A process of assign values for a variables is **Variable Initialization.**
- Rule of Declaration:

1. Variable names must start with a letter or underscore

Example :

```
name = "Alice"     # □ valid
_name = "Bob"      # □ valid
2name = "Chris"    # □ invalid
```

2. Data type is inferred automatically

```
num = 10        # int
num = "hello"   # str (no error)
```

...Cont.

3. Variable names can only contain letters, numbers, and underscores

Example :

```
student1 = "John"   #  valid
student_name = "Mary"  # valid
student-name = "Alex"  #  invalid
```

4. Variable names are case-sensitive

```
age = 20
Age = 30
print(age, Age)  # Output: 20 30
```

...Cont.

5. Do not use Python reserved keywords as variable names

```
class = "CS101"   #  invalid

class_name = "CS101"  #  valid
```

6. Variables should have meaningful names (best practice)

```
x = 50        # unclear

student_age = 50  # clear and readable
```

7. . Python allows multiple assignment

```
x = y = z = 10          # All three get 10

a, b, c = 1, 2, 3       # a=1, b=2, c=3
```

Data Types

- Variables can store data of different types, and different types can do different things.
- The types of the value of a variable is Data type.
- It represents the kind of value that tells what operations can be performed on a particular data.
- To getting the data type of a variable , use type() function.
- Example :

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

- Output :

```
<class 'int'>
```

...Cont.

- Python has the following data types built-in by default, in thesez categories:

Text Type:	**str**
Numeric Types:	**int, float, complex**
Sequence Types:	**list, tuple, range**
Mapping Type:	**dict**
Set Types:	**set**
Boolean Type:	**bool**
Binary Types:	**bytes**
None Type:	**NoneType**

Python String

- A string is a sequence of characters.
- Python treats anything inside quotes as a string.
- This includes letters, numbers, and symbols.
- Python has no character data type so single character is a string of length 1
- **Example** :

  Name=“alamirew”

  Number=“123”

  Chars=‘c’

Document string

- It is used to declare multiple string like note.
- Use “”” “””
- Example :
- name =“””my name is pyhton

  High level programming language”””

String methods:

Index:to access single character

len:to know the number of character in a string

Upper:to convert the string to uppercase

Lowercase: to convert the string to lowercase

Slicing: to access the string to in range of character.

There are a lot of methods , read them!!!

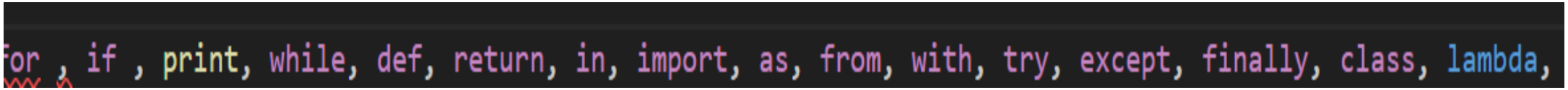
Operators

- Operators are symbols used to perform operations on variables and values.
- standard symbols used for logical and arithmetic operations
- the value on which the operator is applied is called **Operand**.

Operators in python	
+,-*,/.%	Arithmetic operators
<,>,<=,>=,==,!=	Relational operators
and, or, not	Logical operators
&,|,<<,>>,-,^	Bitwise operators
=,+=,-=,*=,/=,%=	Assignment operators
input/print	Input /output operators

- **Please read the syntax, semantics, and output of each operators by exercising a lot!!!**

Python Keywords

- Keywords in Python are reserved words that have special meanings.
- That serve specific purposes in the language syntax.
- Python keywords cannot be used as the names of variable, function or class.
- They are all written in lower case.
- Have color on editors(example : green)
- 


Thank you !!!