**Intro to Programming with Python**

**Software**

Software is a set of instructions to the hardware.

**Programming**

Programming means writing the instructions to create a software.

**Code**

The instructions that we write to create software is called **Code**.

**Syntax**

Similar to Grammar rules in English, Hindi, each programming language has a unique set of rules. These rules are called the **Syntax** of a Programming Language.

Why Python

Python is an easy to learn, powerful programming language. With Python, it is possible to create programs with minimal amount of code. Look at the code in Java and Python used for printing the message **"Hello World"**

**Java:**



1

2

3

4

5

class Main {

public static void main(String[] args) {

System.out.println("Hello World");

}

}

JAVA

**Python:**



1

print("Hello World")

PYTHON

Applications of Python

Python is a versatile language which has applications in almost every field

* Artificial intelligence (AI)
* Machine Learning (ML)
* Big Data
* Smart Devices/Internet of Things (IoT)
* Cyber Security
* Game Development
* Backend Development, etc.

Career Opportunities

Python developers have plenty of opportunities across the world

* DevOps Engineer
* Software Developer
* Data Analyst
* Data Scientist
* Machine Learning (ML) Engineer
* AI Scientist, etc.

Hello World Program in Python

Here is a simple Python code that you can use to display the message **"Hello World"**

**Code**



1

print("Hello World!")

PYTHON

**Output**



Hello World!

Possible Mistakes

Possible mistakes you may make while writing Python code to display the message "Hello World"

* Spelling Mistake in print



1

prnt("Hello World!")

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* Uppercase ‘P’ in Print



1

Print("Hello World!")

PYTHON

* Missing quotes



1

print(Hello World!)

PYTHON

* Missing parentheses



1

print("Hello World!"

PYTHON

Printing Without Quotes

If we want to print the numerical result of 2 + 5, we do not add quotes.

**Code**



1

print(2 + 5)

PYTHON

**Output**



7

If we want to print the exact message "2 + 5", then we add the quotes.

**Code**



1

print("2 + 5")

PYTHON

**Output**



2 + 5

Calculations with python

**Addition**

Addition is denoted by

+

sign. It gives the sum of two numbers.

**Code**



1

2

print(2 + 5)

print(1 + 1.5)

PYTHON

**Output**



7

2.5

**Subtraction**

Subtraction is denoted by

-

sign. It gives the difference between two numbers.

**Code**



1

print(5 - 2)

PYTHON

**Output**



3

**Multiplication**

Multiplication is denoted by

\*

sign.

**Code**



1

2

print(2 \* 5)

print(5 \* 0.5)

PYTHON

**Output**



10

2.5

**Division**

Division is denoted by

/

sign.

**Code**



1

2

print(5 / 2)

print(4/2)

PYTHON

**Output**

**Variables and Data Types**

**Variables**

Variables are like containers for storing values. Values in the variables can be changed.

**Values**

Consider that variables are like containers for storing information. In context of programming, this information is often referred to as value.

Data Type

In programming languages, every value or data has an associated type to it known as data type. Some commonly used data types

* String
* Integer
* Float
* Boolean

This data type determines how the value or data can be used in the program. For example, mathematical operations can be done on Integer and Float types of data.

**String**

A String is a stream of characters enclosed within quotes. Stream of Characters

* Capital Letters ( A – Z )
* Small Letters ( a – z )
* Digits ( 0 – 9 )
* Special Characters (~ ! @ # $ % ^ . ?,)
* Space

Some Examples

* "Hello World!"
* "some@example.com"
* "1234"

**Integer**

All whole numbers (positive, negative and zero) without any fractional part come under Integers. Examples

...-3, -2, -1, 0, 1, 2, 3,...

**Float**

Any number with a decimal point

24.3, 345.210, -321.86

**Boolean**

In a general sense, anything that can take one of two possible values is considered a Boolean. Examples include the data that can take values like -

True or False

-

Yes or No

-

0 or 1

-

On or Off

, etc.

As per the Python Syntax,

True

and

False

are considered as Boolean values. Notice that both start with a capital letter.

Assigning Value to Variable

The following is the syntax for assigning an integer value

10

to a variable

age



1

age = 10

PYTHON

Here the equals to

=

sign is called as **Assignment Operator** as it is used to assign values to variables.