1/10/22

Page No.
Date

* Programming Languages *

→ What is Programming ?
- It is the process of the converting ideas into instructions that computer can understand and execute. These instructions are specific and sequential.

eg: consider a tea which requires different ingredients like sugar, water, tea leaves, ginger which is put in sequential and specific amount.

→ Bug - When something unexpected happens is called bug.

→ Crash - When programs or softwares stop working or freezes.

→ "Orders and Sequence matters in the programming."

⇒ Programming can also be defined as giving computers the right instructions and the correct sequence of steps to produce the desired result.

→ There are tons and thousands of programming languages and each comes with its own set of strengths and weaknesses.

→ Computers only understands '0 & 1' i.e binary code / language and all the code we write in english is converted to machine language so that computers can understand our instructions.

Page No.
Date

→ Source Code - It is a code written by programmers for the softwares and products.

→ There are 3 methods to convert source code into machine code
1) Compile it 2) Interpret it 3) Both

1) Compiler:- It takes high level programming languages and turn it into an executable that contains low level machine code.

2) Interpreter :- The interpreter process our source code each times its run line by line. The main difference b/w interpreter & compiler is that the interpret can execute every line of source code each time.

⇒ Compiled Languages :- C, C++ and Objective-C

⇒ Interpreted Languages :- Php & JavaScript

⇒ Combination :- Java, C# & Python

→ IDE's (Integrated Development Environment) is used to write source code. - It is an application that provides the special tools needed to write, debug and compile code.

* Python

→ Syntax:- It is a rules of a programming language to be followed.

⇒ Statements are the foundations of any program and source code.
Each statements can be made up of:
Keywords + Expressions + Operators

Operators are the statements that tell the computers to perform an action with some input.

Symbol	Operators
+	Addition
−	Subtraction
*	Multiplication
/	Division

↳ This are called Arithmethic Operators

eg: 3 + 2 ← input/operands
↳ Arithmetic operator
↳ This is an expression

eg: 2 + 3 * 6 ≠ 30
= 28 → Because all the arithmetic operators follow the rule of (BODMAS)

⇒ Errors and Bugs are very common in programming

→ Errors Categories :-

1) Syntax :- Languages rules broken

2) Runtime :- The computer was unable to execute

3) Semantic :- The output of the program is not what you have expected

→ Variables - It is any characteristics value like number or characters

Variables in Python can be declared by giving them a name and assigning the value and the assignment of the value is done by the assignment operator which is "=" (equal to)

eg: age = 36
↓ ↳ assignment
variable

⇒ Data Types :- It is the classification of data items which represents the kind of value that tells what operations can be performed on a particular data

→ Integers :- It is a number with no decimal values.

→ Strings :- It is a combination of letters, numbers, symbols and spaces.

eg: age = 36 → integer
print(age)

email = jk@gmail.com → string
print(email)

→ To identify which data-type a function is we use type operator.

eg: print(type(age)) & print(type(age))
= int = str

→ Rules for variables:-

1) The variable name should only contain letters, numbers and underscores. Also the name shouldn't start with numbers.

2) Spaces are not allowed in variable name
eg: account balance (X)
account_balance (✓)

3) The variable names are case-sensitive
eg: Cookies ≠ cookies

4) Variables cannot be reserved keywords.

→ Arithmetic operators

3 + 2 = 5 → addition
3 - 2 = 1 → subtraction
3 / 2 = ~~division~~ 1.5 → division
3 * 2 = 6 → multiplication

3 ** 2 = 3^2 = 9 → exponent

3 % 2 = 1 → modulus (remainder)

3 // 2 = 1 → integer division

→ Float :- Any number with decimal points.
eg: 3.45, 7.42

→ Strings: print ("Hello World")
(strings are put up in " " or ' ' marks)

eg: print (" Let's get started ') (X)

print (" Let's get started ") (✓)

OR

print (" She said, "Fantastic" to him") X

print (' She said, "Fantastic" to him ') ✓

→ Whitespace :- It is a space given in program to make it human readable and make the program free from errors.

→ Comments :- It is used to make the every line of code in a understable manner.

Syntax :- # This is a comment

Problem 1

Code:-

```
print("Challenge 1:")

# A message for user
message = "This is going to be very tricky"
Message = "Very tricky!"
print(message)  # show the message

# Perform mathematical operation
result = 2 ** 3
print("2 ** 3 =", result)
result = 5 - 3
# print("5-3 =", result)

print("Challenge completed!")
```

Soln:

① | This is going to be very tricky | message

② | Very Tricky | Message

print (①)

③ | 2 ** 3 = 8 | result

print (↓) → 2 ** 3 = 8

④ | 2 | result is now updated to