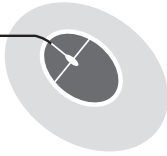




More on Python



LEARNING OUTCOMES

After the lesson, students will be able to:

- » Know about Python fundamentals.
- » Identify tokens.
- » List the types of tokens.
- » Add comments to a program.
- » List the types of comments.

WARM UP

Recall the answers to the following questions:

1. What is a program?

Ans. A program is a collection of instructions that can be executed to perform a specific task.

2. What are the features of Python programming language?

Ans. Features of Python: Open source, platform-independent expressive language, readable, memory management, extensible, easy to learn, interpreted language.

3. What is the difference between the script mode and the interactive mode?

Ans. There are two modes to use the Python interpreter:

- (i) Interactive Mode: Interactive mode, also known as Read Eval Print Loop (REPL) provides us with a quick way of running blocks or a single line of Python code. Without passing the Python script file

to the interpreter, it gets executed directly. The code executes via the Python shell, which comes with Python installation. The `>>>` indicates that the Python shell is ready to execute and send your commands to the Python interpreter. The result is immediately displayed on the Python shell as soon as the Python interpreter translates the command.

- (ii) Script Mode: In this mode, the source code is stored in a file with the `.py` extension and the interpreter is used to execute the contents of the file. If you need to write a long piece of Python code, use the script mode. Note that you can use any text editor for this, including Sublime, Atom, Notepad++, etc. To execute the script by the interpreter, you have to tell it the name of the file.

CHAPTER NOTES

- » Fundamentals of Python is divided into the following categories: Tokens and Comments.
- » Token is the smallest unit inside the given program. Tokens can be defined as a punctuation mark, reserved words or each individual word in a statement.
- » The following are the tokens in Python: Keywords or Reserved words, Identifiers, Literals and Operators.
- » Keywords are a set of special words which are reserved by Python and have specific meanings.
- » Keywords in Python are case sensitive. Note that we are not allowed to use keywords as variables in Python.
- » A variable, also known as an identifier, is used to hold a value.
- » A variable is a name which is used to refer a memory location.
- » In Python, we need not specify the type of variable because Python automatically takes the variable type.
- » Variable names can be a group of both letters and digits, but they have to begin with a letter or an underscore. It is always recommended to use lowercase letters for variable names.

- » Rules for Naming an Identifier:
 - The first character of the variable must be a letter or an underscore (`_`).
 - All the characters except the first character may be a letter in lower-case (a-z), upper-case (A-Z), underscore or a digit (0-9).
 - Identifier name must not contain any white space or special character (`!`, `@`, `#`, `%`, `^`, `&`, `*`).
 - Identifier name must not be the same as any keyword defined in the language.
 - Identifier names are case sensitive. For example, `my name` and `MyName` are not the same.
- » When you assign any value to a variable, that variable is declared automatically.
- » The equal (`=`) operator is used to assign a value to a variable.
- » The other built-in objects in Python are literals. Literals can be defined as data that is given in a variable or constant. Python has the following literals:
 - String literal: A string literal is a sequence of characters surrounded by quotes. We can use single, double or triple quotes for a string.
 - Character literal: A character literal is a single character surrounded by single or double quotes.
 - Numeric literal: Numeric literals are immutable (unchangeable). They can belong to three different numerical types – Integer, Float, and Complex.
- » A Boolean literal can have either of two values: `True` or `False`.
- » There are four different literal collections: List literals, Tuple literals, Dict literals, and Set literals.
- » Python contains one special literal, i.e., `None`. We use it to specify a field that is not created.
- » Operators are symbols which perform an operation on some values. These values are known as operands.
- » In Python, operators are grouped into the following categories:

Arithmetic operators; Comparison operators; Assignment operators; Bitwise operators; Logical operators; Membership operators; and Identity operators.

- » Arithmetic operators are used to perform arithmetic operations between two operands.
- » Comparison operators are used to compare the values of two operands and return a Boolean true or false accordingly.
- » Assignment operators are used to assign the value of the right expression to the left operand.
- » Bitwise operators perform bit by bit operation on the values of two operands.
- » Logical operators are used primarily in expression evaluation, to make a decision. Python supports the following logical operators:
 - Python membership operators, which are used to check the membership of value inside a data structure. If the value is present in the data structure, then the resulting value is true; otherwise, it returns false.
 - Identity operators, which compare an object's memory address.
- » In Python, any statement written along with the # symbol is known as a comment. The interpreter does not interpret the comment. Comments in Python can be used to explain any program code. It can also be used to hide the code. Comments are the most helpful part of any program. They enable you to understand the way a program works.
- » Comments are not a part of a program, but they enhance the interactivity of the program and make the program readable.
- » Single Line Comment: In case a user wants to specify a single line comment, then the comment must start with #.
- » A multi-line comment can be given inside triple quotes.

DEMONSTRATION

- » Use Python tokens
- » Add comments to a program

LAB ACTIVITIES

Create Python programs to:

- (a) Find the sum of the first 5 natural numbers.
- (b) Print the squares of numbers from 1 to 10.
- (c) Print the area of a square.
- (d) Print the perimeter of a rectangle.
- (e) Print the product of any 3 numbers.

ASSESSMENT

Teacher can assess the students by quizzing them on the following.

1. Tokens and their types.
2. Keywords, with examples.
3. Identifiers, with examples.
4. Ask them to write a Python program to define three numeric variables and print their sum.