Besant Technologies

Module 2: Beginning Python Basics

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Python File/Variable/Function Naming Rules - According to PEP8 Standards

- File names should have a combination of letters in lowercase (a to z) or uppercase (**A to Z**) or digits (**0 to 9**) or an underscore (_).

- Create a name that makes sense..

- If filename is lengthy, use underscore to separate them (first_example.py).

- Don't start a file name with a number, You can use underscore character.

- Python does not support special symbols like !, @, #, $, %, etc for naming files except underscore character (_).

- Python can be treated in a procedural way, an object-oriented way or a functional way.

Creating/Saving Python File

- Python files can be saved as .py (first_program.py).

- .py is the extension of the Python file.

Python IDE's or Code Editors

IDEs increase programmer productivity by introducing features like editing source code, building executables, and debugging.

Highlights of an IDE:

- Syntax Highlighting.

- Auto Complete.

- Debugging.

Types of Python IDE's or Code Editors:

- IDLE is Python's Integrated Development and Learning Environment.

- Pycharm - Its a widely used Python IDE created by JetBrains (Free/Paid Version available)

- Visual Studio - Is an open-source (and free) IDE created by Microsoft. It finds great use for Python development (Free/Paid Version available).

- Sublime Text is a very popular code editor. It supports many languages, including Python

- GNU Emacs - Is an open-source code editor used for mac/apple systems.

- Atom is an open-source code editor by Github and supports Python development

- Jupyter is widely used in the field of data science

- Spyder is an open-source IDE most commonly used for scientific development

- PyDev is a strong python interpreter and is distributed as a third-party plugin for Eclipse IDE

- Thonny is an IDE ideal for teaching and learning Python programming

Writing Python First Program/Print Statement

Using print() we can write our first program ("Hello World!"). Print function displays the specified message to the screen, or other standard output device.

Example: print("Hello World!")

Running/Executing Python Program

- Using command line - python filename (python first_program.py)

- Double click the python file

- Run your python program in your IDE's using the run/play button.

Comments & Docstring

Comment # - The hash (#) symbol is used to comment the code/line in the python, So that particular line will be skipped for execution. It can be given at the beginning of the line or anywhere in the particular line.

Example - # this is a commented line.

Docstring "" "" - Is known as a short for documentation string. Python docstrings (documentation strings) are the string literals that appear right after/before beginning of the file, definition of a function/method, class or module. Triple quotes are used for writing docstrings.

Example - """ This is an example of doc string """

Python Input/Output

- input() - Is a function which takes the value from the user and passes to the system.
    - Eg - input('Enter the value')
- Output - print() is used to display the output of the program.
    - Eg - print(" Hello welcome to python world")

Python Variables

A variable is a named location used to store data in the memory. It is helpful to think of variables as a container that holds data that can be changed later in the program.

Example of naming variables:

nms = 10

a, b, c = 5, 3.2, "Hello" - Assigning multiple variables in a single line

x = y = z = "welcome" - Assigning same values to different variables

Python Data Types & Data Structures

Data types are known as what kind of data and different types of them does python accept.

Types of Python Data Types:

- Numbers - Integers, floating/decimal point numbers and complex numbers fall under the Python numbers category. They are defined as int, float and complex classes in Python. They support both positive and negative values.

- Strings/Characters str() - We can use single quotes or double quotes to represent strings. String accepts alphabets, number & special characters.

- Boolean bool() - Boolean type have two values, i.e: True and False

Data Structures are known as various types of arrangements of data.

Types of Python Data Structures:

- List/Array list() [ ]- List is a collection of items of different/same data types. It is an ordered sequence of items. A list object contains one or more items, which are separated by comma and enclosed in square brackets. Lists are mutable, means, that the value of elements of a list can be altered.
  - Eg - [12, -4, 5.6, 'hello', (1,10), [1, 2], 12, {'a','b'}, {'a':100}, True]

- Tuple tuple() ( )- Tuple is also kind of similar to a list, but tuple is immutable. Tuples once created cannot be modified. Tuples are used to write-protect data and are usually faster than lists as they cannot change dynamically.
  - Eg - (12, -4, 5.6, 'hello', (1,10), [1, 2], 12, {'a','b'}, {'a':100}, False)

- Set set() { } - Set is an unordered collection of unique items. Set object contains one or more items, which are separated by comma. Set accepts only immutable data types like string, numbers, boolean & tuple. They eliminate duplicates.

- Eg - { 12, -4, 5.6, 'hello', (1,10), True}

- Dictionary dict() {key:value} - Dictionary is an unordered collection of key-value pairs. It is generally used when we have a huge amount of data. Keys are unique, values are not unique. Key accepts only immutable data types like string, numbers, boolean & tuple. Values accepts only any data types like string, numbers, boolean, tuple, list, set & dictionary.

  - Eg - { 'name': 'hello', (1,10) : True}

Python Operators

In Python, operators are special symbols that designate that some sort of computation should be performed. The values that an operator acts on are called operands.

Types of Operators:

- Arithmetic operators - It is used to perform mathematical operations like addition, subtraction, multiplication, division, modulus, floor division and exponent.
- Comparison operators - It is used to compare values. It returns either True or False according to the condition.
- Logical operators - It is used to apply all or any one condition to satisfy. It returns either True or False according to the condition.
- Special operators - Is used to identify two different variables having the same values or not.
- Membership operators - They are used to test whether a value or variable is found in a sequence (string, list, tuple, set and dictionary).
- Assignment operators - These are used in Python to assign values to variables.
- Bitwise operators - It acts on operands as if they were strings of binary digits. They operate bit by bit.