Python Programming

Python

- Python is an open source, interpreted, object oriented, high level programming language.
- Python was created by Guido Rossum in 1989
- Python is based on or influenced with two programming languages:
  - ABC language, a teaching language created as a replacement of BASIC
  - Modula-3

Python Features

- Easy to use
- Expressive language
- Interpreted
- Platform independent
- Free and Open Source
- Robust
- Rich Library Support

Python IDEs

- Online Compiler
- IDLE
- Sublime Text
- Atom
- PyCharm
- VisualStudio Code
- Vim
- Spyder
- Jupyter Notebook
- Eclipse

Python Character Set

- Character set is a set of valid characters that a language can recognize
- A character represents any letter, digit or any other symbol.
- Every component of a Python program is created using the character set.
- Python has the following character set:
  - Letters A-Z, a-z
  - Digits 0-9
  - Special Symbols
  - Whitespaces

Tokens

- The smallest individual unit in a program is known as a token or a lexical unit
- Python has the following tokens
  - Keywords
  - Identifiers
  - Literals
  - Operators
  - Punctuators

Keywords

- Keywords are the words that convey a special meaning to the compiler/interpreter
- They are reserved for special purpose

Identifiers

- Identifiers are the names given to variables, functions, lists, dictionaries, classes, object
- Rules for naming an identifier are
  - The first character must be a letter or an underscore
  - Upper and lower case letters are different
  - The digits 0 – 9 can be used except for the first character
  - It must not be a Python keyword
  - An identifier cannot contain any special character except for underscore

Literals

- Literals are data items that have a fixed value
  - String literals
  - Numeric literals
  - Boolean literals
  - Special Literal None

Operators and Punctuators

- Operators are tokens that trigger some computation when applied to variables in an expression
- Punctuators are symbols that are used in programming languages to organize sentence structures

Comments

- Comments are ignored by the interpreter
- Single line comments
  - #
- Multiline comments
  - Triple quoted multi-line string

Variables

- A variable in Python represents named location
- A variable is created only when a value is assigned to it.
- Variables are not storage containers in Python
- Python preloads some commonly used values in an area of memory called front-loaded dataspace
- The dataspace memory has literals/values at defined memory locations and each memory location has a memory address

Dynamic Typing

- A variable pointing to a value of a certain type, can be made to point to a value / object of different type. This is called Dynamic typing
- To determine the type of a variable ,type() can be used
  - type(<variablename>)

Multiple Assignments

- Assigning same values to multiple variables
  - a=b=c=10
- Assigning multiple values to multiple variables
  - x,y,z=10,20,30

Input and Output

- input() function is used to get the input from the user interactively
- variable=input(<prompt to be displayed>)
- Return type of the input() function is String
- Python offers 2 functions int() and float() to be used with input() to convert the values received through input() into int and float types.

Input and Output

- The print() function is used to send output to standard output device.
- print(“hello”)
- print(3.14)
- print(“sum of 2 and 3 is“,2+3)
- a=5
- print(“Double of”, a ,”is”,2*a)

Input and Output

- The print() function automatically converts the item to strings
- It inserts spaces between items automatically.
- The value of separator can be changed by giving the sep argument in print() function
  - print("Hello","World",sep=',')
- print() appends a newline character at the end of the line unless the end argument is given
  - print("Hello",end=' ')
  - print("World")

Thank you