Python Programming

Introduction

Agenda :

- Introduction to Python
- Installation
- Python IDE, Jupyter Notebook
- Compiler vs Interpreter
- Python character set, keywords and Identifiers
- Variables and constants
- Hello world in Python

Python :

- Invented in the Netherlands, early 90s by Guido van Rossum
- Open sourced from the beginning
- Considered a scripting language
- Scalable, object oriented and functional from the beginning
- Used by Google from the beginning
- Interpreted langauage
- Used in web development, Data science, Machine learning

Installing Python

Python official page : https://www.python.org/downloads/

1. Go to the official python page
2. Select Python version that you want to install
3. Download exe file
4. Install and set environment variable
5. Verify if it is installed - type “python” in command prompt

Jupyter Notebook :

The Jupyter Notebook is the original web application for creating and sharing computational documents. It offers a simple, streamlined, document-centric experience.

Jupyter supports over 40 programming languages, including Python, R, Julia, and Scala.

Notebooks can be shared with others using email, Dropbox, GitHub and the Jupyter Notebook Viewer.

File extension - .ipynb

Python IDLE

When you install Python, IDLE is also installed by default. This makes it easy to get started in Python. Its major features include the Python shell window(interactive interpreter), auto-completion, syntax highlighting, smart indentation, and a basic integrated debugger.

IDLE is a decent IDE for learning as it's lightweight and simple to use. However, it's not for optimum for larger projects.

Other IDE :

VS code, Pycharm, Spyder, Sublime text etc

Compiler vs Interpreter :

Interpreter

Translates program one statement at a time.
Interpreters usually take less amount of time to analyze the source code.
However, the overall execution time is comparatively slower than compilers.

Compiler
Scans the entire program and translates it as a whole into machine code.
Compilers usually take a large amount of time to analyze the source code.
However, the overall execution time is comparatively faster than interpreters.

Python Basics :

Character Set :

A character set is a set of valid characters acceptable by a programming language in scripting. In this case, we are talking about the Python programming language.

Alphabets: All capital (A-Z) and small (a-z) alphabets.

Digits: All digits 0-9.

Special Symbols: Python supports all kind of special symbols like, " ‘ l ; : ! ~ @ # $ % ^ ` & * ( ) _ + – = { } [ ] \ .

White Spaces: White spaces like tab space, blank space, newline, and carriage return.

Other: All ASCII and UNICODE characters are supported by Python that constitutes the Python character set.

Keywords:

Keywords are words that have some special meaning or significance in a programming language. They can’t be used as variable names, function names, or any other random purpose. They are used for their special features. In Python we have 33 keywords.

Eg - try, False, True, class, break, continue, and, as, assert, while, for, in, raise, except, or, not, if, elif, print, import, etc.

Identifiers:

- Identifiers are the names given to any variable, function, class, list, methods, etc. for their identification. Here are some rules to name an identifier:-
- As stated above, Python is case-sensitive. So case matters in naming identifiers. And hence geeks and Geeks are two different identifiers.
- Identifier starts with a capital letter (A-Z) , a small letter (a-z) or an underscore(_). It can’t start with any other character.
- Except for letters and underscore, digits can also be a part of identifier but can’t be the first character of it.
- Any other special characters or whitespaces are strictly prohibited in an identifier.
- An identifier can’t be a keyword.

Variables and Constants :

In programming, a **variable** is a container (storage area) to hold data.

```
number = 10
```

Assignment of variable

A **constant** is a special type of variable whose value cannot be changed.

In Python, constants are usually declared and assigned in a module (a new file containing variables, functions, etc which is imported to the main file).

Hello world Program:

“Hello, World!” is often the first program that programmers learn to write when they start learning a new programming language.

Here we will be using the Python print() function for the same. The print() function in Python is used to print Python objects as strings as standard output.

```
print("Hello World")
```

Output - Hello World

References and links:

Python Documentation : https://docs.python.org/3/

Jupyter Notebook : https://jupyter-notebook.readthedocs.io/en/stable/

Github : https://github.com/lunatic-bot/PythonTraining

LinkedIn : https://www.linkedin.com/in/atalbajpai/

Thank You