PROGRAM: 1

AIM: Various environments that can be used for python programming.

SOLUTION: At its core, the main purpose of Python environments is to create an isolated environment for Python projects.

Some of them are:

- **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.
- **SUBLIME TEXT 3:** Sublime Text is a popular code editor that supports many languages including Python. It is fast, highly customizable. It has basic built-in support for Python when you install it. However, you can install packages such as debugging, auto-completion, code linting, etc. There are also various packages for scientific development, Django, Flask, and so on. Basically, you can customize Sublime text to create a full-fledged Python development environment as per your need.
- **PyCharm**: PyCharm is an IDE for professional developers. It is created by JetBrains, a company known for creating great software development tools.
  There are two versions of PyCharm:
  1. Community - free open-source version, lightweight, good for Python and scientific development
  2. Professional - paid version, full-featured IDE with support for Web development as well

  PyCharm provides all major features that a good IDE should provide: code completion, code inspections, error-highlighting and fixes, debugging, version control system, and code refactoring. All these features come out of the box.
- **SPYDER:** Spyder is an open-source IDE usually used for scientific development. The easiest way to get up and running up with Spyder is by installing Anaconda distribution. If you don't know, Anaconda is a popular distribution for data science and machine learning. The Anaconda distribution includes hundreds of packages including NumPy, Pandas, scikit-learn, matplotlib and so on. Spyder has some great features such as autocompletion, debugging and iPython shell.
- **VIRTUAL STUDIO CODE:** Visual Studio Code (VS Code) is a free and open source IDE created by Microsoft that can be used for Python development. You can add extensions to create a Python development environment as per your need in VS code. It provides features such as intelligent code completion, linting for potential errors, debugging, unit testing, and so on.
  VS Code is lightweight and packed with powerful features. This is the reason why it becoming popular among Python developers.

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06/10/2020 SOFT COMPUTING LAB 2020

AIM: Write a program to implement all operators in python

SOLUTION:
https://colab.research.google.com/drive/1HYvshWh0Bjs1JKk5xovSODKcGkewKbDY?usp=sharing

AIM: Make a list of any 6 libraries of Python with their functionality in brief. And, also write the steps required for installing any new library in a given environment.

SOLUTION:

A Python library is a reusable chunk of code that you may want to include in your programs/ projects. Compared to languages like C++ or C, a Python library do not pertain to any specific context in Python. Here, a 'library' loosely describes a collection of core modules. Essentially, then, a library is a collection of modules.

Important python libraries are:

1. Matplotlib

Matplotlib helps with data analysing, and is a numerical plotting library. Histogram, bar plots, scatter plots, area plot to pie plot, Matplotlib can depict a wide range of visualizations.

2. Pandas

Pandas stand for *Python Data Analysis Library.* It provides fast, expressive, and flexible data structures to easily (and intuitively) work with structured (tabular, multidimensional, potentially heterogeneous) and time-series data. It is designed for easy data manipulation, reading, aggregation, and visualization.

3. NumPy

It has advanced math functions and a rudimentary scientific computing package. One of the most fundamental packages in Python, *NumPy* is a general-purpose array-processing package. It provides high-performance multidimensional array objects and tools to work with the arrays. NumPy is an efficient container of generic multi-dimensional data.

4. SciPy

Next up is SciPy, SciPy uses arrays as its basic data structure. It has various modules to perform common scientific programming tasks as linear algebra, integration, calculus, ordinary differential equations, and signal processing. It has a number of user-friendly and efficient numerical routines. These include routines for optimization and numerical integration.

5. TensorFlow

TensorFlow is an AI library that helps developers to create large-scale neural networks with many layers using data flow graphs. TensorFlow also facilitates the building of Deep

Learning models, push the state-of-the-art in ML/AI and allow easy deploy of ML-powered applications. TensorFlow is quite efficient when it comes to classification, perception, understanding, discovering, predicting, and creating data.

6. Requests

Requests is a Python library that lets you send HTTP/1.1 requests, add headers, form data, multipart files, and parameters with simple Python dictionaries. It also lets you access the response data in the same way.

Installing New library

With Python, we can build just about anything, from simple scripts to full applications. The Python language, however, doesn't come pre-installed with all of the features we might want (or require). When we need particular functionality, we can look toward Python *packages/ libraries*.

A package structures Python module, which contains pre-written code that other developers have created for us. Modules/ libraries are handy when we are looking for specific functionality.

1. After installing python, go to python command line terminal "cmd". 2. We can use pip, Python's package manager, to install and manage Python packages 3. We can use pip to install packages, like so:

```
pip install NumPy
```

In the example above, pip will install the NumPy package. Likewise, we can download any library according to our needs in the future.