Training Report Day-1

6 June 2024

❖ Introduction to Python Programming:-

You will begin your journey into Python programming, which is one of the most popular programming languages in the field of data science. Python is known for its versatility and power, making it a suitable choice for various data science tasks, such as data cleaning, pre-processing, analysis, and modelling. Learning Python will provide you with access to a wide range of libraries and tools that are specifically designed for data science, which can make your work with data much more efficient and effective.

❖ Why Python

Python is a good choice for beginners in data science for several reasons.

- Python has a simple and easy-to-learn syntax that is designed to be readable and resembles the English language. This makes it easy for beginners to write code and understand what is happening in their code.
- Python has a vast array of libraries and tools that are specifically designed for data science, including NumPy, Pandas, Matplotlib, and Scikit-learn. These libraries are essential for data manipulation, visualization, and machine learning tasks.
- Python has a large open source community that provides support, tutorials, and documentation, making it easier for beginners to learn and use Python for data science tasks.
- Python is a flexible language that can be used for a wide range of data science tasks and can handle large datasets.

Overall, Python's simplicity, vast array of libraries, open source community, and flexibility make it an excellent choice for beginners in data science.

❖ Where do we practice coding?

IDE

An Integrated Development Environment (IDE) is a software application that provides programmers with a comprehensive set of tools and features to write, debug, and test their code in a single interface. IDEs often include a text editor, a debugger, a compiler, and other features like autocomplete, syntax highlighting, and code formatting. IDEs are designed to

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make the coding process more efficient and productive by providing all the necessary tools and features in one place, which can save time and effort for developers. IDEs are commonly used for programming languages like Python, Java, C++, and many more.

Few examples of IDE:

- PyCharm
- Spyder
- IDLE
- Jupyter
- Visual Studio Code (VSCode):
- Google Colab

❖ Why Google Colab :-

Google Colaboratory is a good choice of IDE for beginners for several reasons.

✓ It is a web-based platform that does not require any installation or setup, making it easily accessible to anyone with an internet connection.

✓ It offers a free environment for users to run and execute code, making it ideal for beginners who may not want to invest in expensive hardware or software.

✓ It allows for collaborative work and sharing of code and notebooks, making it easy for beginners to work with others and get feedback on their work.

✓ It comes with pre-installed libraries and tools commonly used in data science, such as NumPy, Pandas, and Matplotlib, making it easy for beginners to start working on their projects without having to worry about setting up their environment.

❖ Google Colab Basics

Google Colaboratory (also known as Google Colab or simply Colab) is a cloud-based platform provided by Google that allows users to write, run, and share code in a Jupyter notebook environment. Colab offers free access to GPUs, which makes it an attractive tool for machine learning and deep learning practitioners.

The toolbar in Colab provides access to a variety of tools that are useful when working with notebooks. Here is a brief overview of some of the key features:

- o **File operations**: The toolbar allows you to create new notebooks, open existing ones, save your work, and download notebooks in various formats.

- o **Runtime options**: You can use the toolbar to start and stop the notebook's runtime environment, which determines the computing resources available to your notebook.
- o **Code execution**: The toolbar includes buttons that allow you to execute code cells in your notebook. You can also use the keyboard shortcuts Shift+Enter to execute the current cell and move to the next one or Ctrl+Enter to execute the current cell and remain on it.
- o **Cell operations**: The toolbar provides options to insert new cells, delete existing ones, move cells up or down, and merge cells.

Example:-

```
Print ("Hello World")
```

❖ Numeric Data Types in Python:-

We will be focusing on two main numeric data for the time being:
- o Integers: Integers (or ints) are whole numbers without decimal points. In Python, integers can be positive, negative, or zero. They can be created by writing a number without a decimal point or by using the int() function.
- o Floats: Floats are numbers with decimal points. In Python, floats can be positive, negative, or zero. They can be created by writing a number with a decimal point, by using scientific notation (e.g. 1.23e-4), or by using the float() function.
- o Booleans: Boolean is a data type in Python that can have two values: True or False, used for logical operations.

Python also supports other numeric data types, such as complex numbers, bool for boolean values (True or False) and decimal for fixed-precision decimal values. Additionally, Python provides a rich set of operators and functions for performing arithmetic operations and other manipulations on numeric data.

❖ Basic Arithmetic:-

```
# Addition
2+1
```

```
# Subtraction
2-5
```

```
# Multiplication
2*2
```

```
# Division
3/2
```

```
3//2
```

```
# Exponential
2**3
```

❖ **Do you Know**

operator precedence in python follows the **BODMAS** rule for arithmetic expressions. The precedence of operators is listed below in a high to low manner.

Firstly, parantheses will be evaluated, then exponentiation and so on.

B – Bracket

O – Order

D – Division

M – Multiplication

A – Addition

S – Subtraction

✓ **Example:**-

```
# BODMAS nostalgia
print((5 + 2) * 3 ** 2 - 1)
```

```
# According to BODMAS Rule
2+ 10* (10+3)
```

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