<u>Assignment 1</u>

Pandas

Pandas is an open-source Python library. It is known for its strength in data manipulation and analysis. It offers data structures and functions that allow for effective data operations.

- It supports operations like merging, reshaping, selecting, and cleaning data.
- It provides functions to handle missing data.
- It is generally used for data science and is an essential tool for data analysts, scientists, and engineers who work with structured data in Python.

NumPy

NumPy is a Python library used to work with arrays. Its full form is "Numerical Python".
It is used to create, manipulate, and analyze arrays faster than the regular python programming arrays.

- Numpy uses less memory and storage space.
- It provides a high-performance multidimensional array object and tools for working with these arrays.
- It is an open source project, so we can use it easily.

TensorFlow

TensorFlow is an open-source machine learning framework developed by Google. It is a versatile tool for building models across various tasks, such as natural language processing, image recognition, handwriting recognition, and various computational simulations like those involving partial differential equations.

- It can be deployed on various platforms, including cloud, mobile, and web.
- It helps you to implement best practices for data automation, model tracking, performance monitoring, and model retraining.
- It is used to create a large-scale neural network with many layers.

Keas

Keras is a high-level neural networks API written in Python, running on top of TensorFlow. It is designed to enable fast experimentation with minimal code. It is written in Python and is used to make the implementation of neural networks easy. It provides a high-level interface for building and training deep learning models, while also allowing for low-level control when needed.
- It is modular and flexible, allowing for easy model construction.
- It is suitable for both convolutional networks (for image data) and recurrent networks (for sequential data).
- Keras simplifies deep learning and makes it more accessible with user-friendly features
- It Minimizes cognitive load with clear, concise interfaces.

scikit-learn (sklearn)

Scikit-learn is a free machine learning library offering straightforward and effective tools for data analysis and modeling. It is built on NumPy, SciPy, and Matplotlib, making it a powerful tool for tasks like classification, regression, clustering, and dimensionality reduction. It offers a wide range of features to address various aspects of the data science pipeline.
- It finds patterns in data and groups the similar items together.
- It is extensively utilized throughout the bank for classification, predictive analytics, and a wide range of other machine learning tasks.
- It is simple and easy to use for beginners.
- It offers a straightforward and uniform API, comprehensive documentation, and a broad selection of algorithms and tools for diverse machine learning tasks.

PyTorch

PyTorch is an open-source deep learning framework that provides both Python and C++ interfaces. It operates within the torch module and processes data by inputting it as a tensor. Pytorch is commonly used in applications like image recognition and language processing. And it is relatively easy for most machine learning developers to learn and use.

- PyTorch allows for dynamic creation of graphs, making it easier to debug and experiment.
- It supports automatic differentiation for building and training neural networks and provides multi-dimensional tensors and operations on them.
- PyTorch facilitates rapid and flexible experimentation along with efficient production bcause of its user-friendly interface, support for distributed training, and a comprehensive ecosystem of tools and libraries.