Training Sessions Breakdown on Python for Machine Learning and Neural Networks

Session 1- Introduction to Python for Machine Learning:

- Set up virtual environments.
- Basic operations with NumPy, Pandas, and Matplotlib.

Session 2- Introduction to Supervised Learning:

- Basics of supervised learning.
- Importance of training, validation, and testing datasets.
- Simple classifier implementation and evaluation.

Session 3- Data Preprocessing:

- Data cleaning, one-hot encoding, normalization, and centering.

Session 4- Cross-Validation Techniques:

- Understanding and applying cross-validation for model evaluation.

Session 5- Preventing Data Leakage:

- Identifying and preventing data leakage.

Session 6- Feature Selection Methods:

- Importance of feature selection.
- Greedy Forward LDA-based feature selection.

Session 7- Support Vector Machines (SVM):

- Theory and implementation of SVM and RBF SVM.

Session 8- Decision Trees and Random Forests:

- Theory and implementation of decision trees and random forests.

Session 9- Introduction to Unsupervised Learning:

- Basics of unsupervised learning.
- K-means clustering and PCA.

Session 10- Neural Networks - MLP with Simulated Data:

- Basics of neural networks.
- Implementing and evaluating MLP on simulated data.

Session 11- Neural Networks - MLP with Real Dataset:

- Applying MLP to a real dataset.

Session 12- Regularization Techniques in Neural Networks:

- Implementing dropout and batch normalization.

Session 13- Convolutional Neural Networks (CNN) with Simulated Data:

- Basics of CNNs.
- Implementing and evaluating CNN on simulated data.

Session 14- Convolutional Neural Networks (CNN) with Real Dataset:

- Applying CNN to a real dataset.