

Training Day 11 Report:

Date: 9 July, 2025 (Wednesday)

Location: PG Block HPC Lab

Guided by: Training Instructors (Classroom-Based)

Main Objective:

To understand the K-Nearest Neighbors (KNN) algorithm and its use in classification, grasp confusion matrix and performance metrics, and finalize project title with objectives for ML+IoT project.

Summary of the Day's Work

Today's class focused on supervised ML classification using KNN, learning how to measure accuracy and precision with the confusion matrix, and beginning the project proposal with objective writing.

Topics/Areas Covered:

- K-Nearest Neighbors (KNN) Algorithm
- How to choose the right algorithm for ML projects
- Concept of Confusion Matrix Accuracy & Precision Formula
- Project Title Finalization & Objective Writing

Concepts Learned:

- KNN is used for classification based on nearest data points.
- Steps: Choose K, calculate distances, pick K nearest, assign most common class.
- KNN is simple and works well for small datasets.

- Confusion Matrix helps evaluate classification results.
- $\text{Accuracy} = (\text{TP} + \text{TN}) / (\text{TP} + \text{TN} + \text{FP} + \text{FN})$
- $\text{Precision} = \text{TP} / (\text{TP} + \text{FP})$
- Different algorithms perform differently based on data type and size.

Tools / Platforms Used

- Python (scikit-learn)
- Colab / Jupyter Notebook

Tasks Performed:

- Understood how KNN works with real data.
- Compared different algorithms to use for the ML + IoT project.
- Discussed confusion matrix and its importance in evaluation.
- Finalized the project title and noted down its objective.
- Assigned to read review paper and methodology for project preparation.

Project Work:

- Finalized project title.
- Wrote basic objectives and discussed possible ML models to use.

Observations / Reflections

KNN was easy to understand and gave clarity on how predictions are made. Confusion matrix added a new way to judge model performance. Finalizing the project made today's session feel more real and focused.

Key Takeaways

- Learned to evaluate classification using confusion matrix.
- Identified best algorithms for project goals.
- Project direction is now clear and actionable.