ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TRAINING TR-102 REPORT DAY 10 4 JULY 2025

Overview:

The tenth day of training introduced three major concepts — KNN (K-Nearest Neighbors), CNN (Convolutional Neural Network), and LAMP architecture.We explored how KNN and CNN are used in Artificial Intelligence for classification, pattern recognition, and image processing, while LAMP was studied as a software stack used in web and AI-based application deployment.

Learning Objectives:

• Understand the working principle of the K-Nearest Neighbors (KNN) algorithm.

• Learn how Convolutional Neural Networks (CNNs) function for image recognition.

• Explore the components and functionality of the LAMP stack.

• Understand the connection between machine learning models and deployment frameworks.

• Analyze the applications of KNN, CNN, and LAMP in real-world AI systems.

KNN (K-Nearest Neighbors)

K-Nearest Neighbors (KNN) is a supervised machine learning algorithm used for classification and regression tasks.It is one of the simplest and most effective algorithms based on the concept of similarity — objects with similar features are likely to belong to the same class.

Working of KNN:

1. Choose the number of neighbors (K).

2. Calculate the distance between the new data point and all other existing data points (commonly using Euclidean distance).

3. Select the K nearest data points.

4. Assign the class based on the majority of the K neighbors.

CNN (Convolutional Neural Network)

Convolutional Neural Networks (CNNs) are a class of deep learning algorithms mainly used for image recognition, computer vision, and pattern detection.CNNs automatically learn spatial hierarchies of features from images through a series of convolution and pooling layers.

Working of CNN:

1. **Input Image** → Convolution: Filters detect edges, colors, and patterns.

2. **Pooling:** Reduces image size for efficiency.

3. **Flattening:** Converts 2D matrices to 1D vectors.

4. **Fully Connected Layers:** Combine features for classification.

5. **Output:** Predicts the object category (e.g., "Cat" or "Dog")

LAMP Architecture

LAMP stands for Linux, Apache, MySQL, and PHP/Python/Perl.It is an open-source web development stack used to deploy dynamic applications, including AI dashboards, APIs, and data-driven systems.

Workflow of LAMP:

1. **User Request:** A user sends a request via a browser.

2. **Apache Server:** Receives and routes the request.

3. **Backend Script (PHP/Python):** Processes the request logic.

4. **MySQL Database:** Stores and retrieves necessary data.

5. **Response:** The result is sent back to the browser via the Apache server.

Conclusion:

Day 10 provided comprehensive knowledge of both AI algorithms and deployment frameworks. We learned how KNN helps classify data based on proximity, how CNNs revolutionize visual learning through deep networks, and how LAMP supports real-world application deployment.This day marked an important step toward understanding how Artificial Intelligence is built, trained, and deployed, combining theoretical and practical insights into a complete AI workflow.