Deep Learning Notes

# What is DL

Deep Learning (DL) is a subset of machine learning that uses neural networks with many layers to automatically learn patterns and representations from large amounts of data. It is especially effective for tasks such as image recognition, natural language processing, and speech recognition.

# What is Neural Network and its Types

A Neural Network is a set of algorithms, modeled loosely after the human brain, that is designed to recognize patterns. It interprets sensory data through a kind of machine perception, labeling, or clustering of raw input.

Types of Neural Networks:

* - Feedforward Neural Network (FNN): Basic network where connections do not form cycles.
* - Convolutional Neural Network (CNN): Used primarily for image data.
* - Recurrent Neural Network (RNN): Designed for sequential data like time series or text.
* - Generative Adversarial Network (GAN): Used for generating new data similar to training data.

# What is CNN in Simple Words

A Convolutional Neural Network (CNN) is a type of deep learning model especially good at working with images. It scans images in small pieces (like looking through a small window) to detect features such as edges, textures, and patterns, and then combines this information to recognize objects.

# Short Notes on the Pipeline Discussed in a Lecture

1. Data Collection: Gather data relevant to the task (images, text, etc.).

2. Data Preprocessing: Clean, normalize, and format data into a usable structure.

3. Feature Engineering (if applicable): Select or create useful features from raw data.

4. Model Selection: Choose the appropriate deep learning architecture (e.g., CNN, RNN).

5. Model Training: Feed data into the model and allow it to learn patterns.

6. Model Evaluation: Test model performance using metrics like accuracy, precision, etc.

7. Prediction & Deployment: Use the trained model to make predictions and deploy it to real-world applications.