### **1. What is DL (Deep Learning)?**

* DL stands for **Deep Learning**, a subset of Machine Learning inspired by the human brain (neural networks).
* It uses large neural networks to **mimic human behavior** in processing complex data.
* Applications:
  + **ANN** – General data processing
  + **RNN** – Language understanding, sentiment analysis
  + **CNN** – Computer vision tasks
* **Example Project**: Forest Fire Detection using Deep Learning

### **2. What is a Neural Network and its Types?**

A **Neural Network** is a series of interconnected layers of nodes (neurons) that process input data to make predictions or decisions.

**Types:**

* **ANN (Artificial Neural Network)** – Basic neural network, used for structured/tabular data.
* **CNN (Convolutional Neural Network)** – Specialized for **image and visual data**.
* **RNN (Recurrent Neural Network)** – Designed for **sequential data** like text, speech.
* **GAN (Generative Adversarial Network)** – Used to generate new data similar to the training data.
* **LSTM (Long Short-Term Memory)** – A type of RNN for long-term dependencies in sequences.

### **3. What is CNN (Convolutional Neural Network)?**

* CNN is a **deep learning model** specifically designed for **image recognition and classification**.
* It uses **convolutional layers** to extract features from images.
* Common applications: Face detection, object classification, medical imaging, etc.

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### **4. Short Notes for Project Pipeline (Forest Fire Detection using DL)**

**Project Title**: Forest Fire Detection using CNN (DL)

**Pipeline:**

1. **Data Collection & Loading**
   1. Dataset: Wildfire Image Dataset from Kaggle
   2. Use **Kaggle API** and load data in **Google Colab**
2. **Image Processing & Augmentation**
   1. Resize, normalize images
   2. Apply transformations (flip, rotate) to increase data diversity
3. **CNN Model Creation**
   1. Build a Convolutional Neural Network
   2. Input: Training images
4. **Training & Validation**
   1. Train the model using labeled images
   2. Use validation set to tune performance
5. **Testing & Evaluation**
   1. Test the model on unseen data
   2. Evaluate using accuracy, precision, recall, etc.