**Week1 Assessment - Forest Fire Detection**

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

Deep Learning is a branch of Artificial Intelligence (AI) where machines try to **mimic how the human brain works**.  
It uses structures called **neural networks** that allow computers to learn from data, just like humans do from experience.

In deep learning, we try to achieve:

* Data processing → using **ANN (Artificial Neural Network)**
* Understanding text/emotion → using **RNN (Recurrent Neural Network)** (e.g. NLP tasks)
* Vision (images) → using **CNN (Convolutional Neural Network)**

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

A **Neural Network** is a system of algorithms that mimics the way the human brain analyzes and processes information.

There are 3 major types:

1. **ANN (Artificial Neural Network):**  
   Used for basic tasks like classification, prediction, etc. It works with structured data.
2. **RNN (Recurrent Neural Network):**  
   Used for unstructured data like text, audio, and time series.  
   Common in Natural Language Processing (NLP), emotion detection, etc.
3. **CNN (Convolutional Neural Network):**  
   Specially made for image data and used in Computer Vision.  
   It can detect edges, shapes, and patterns in images.

**3. What is CNN in Simple Words?**

It is a type of deep learning model designed to work with **images**. CNN can automatically learn the features of an image such as edges, textures, and objects. It’s widely used in facial recognition, self-driving cars, and fire detection systems. CNN have revolutionized tasks like facial recognition, medical image analysis, and self-driving cars by providing high accuracy with minimal manual feature extraction.

**4. Write Short Notes about the Project Pipeline.**

1. **Data Collection**

* Get image dataset from open sources like Kaggle or Roboflow
* Split into: Training set, Validation set, Test set

1. **Image Processing and Augmentation**

* All images should have the **same resolution**
* Apply techniques like rotation, flipping, zoom to create more training examples
* Helps model to recognize patterns better

1. **Build CNN Model**

* Use TensorFlow or Keras to create and train a CNN model

1. **Test and Evaluate**

* Check model performance on validation/test data
* Improve model based on accuracy and loss