**Week 1 Assessment - Forest Fire Detection**

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

**Deep Learning (DL)** is a branch of Artificial Intelligence (AI) that teaches computers to **learn and make decisions like humans** by using **neural networks with many layers**. Unlike traditional machine learning, deep learning can automatically discover features from raw data without manual intervention. These models are capable of achieving state-of-the-art performance in tasks such as image classification, speech recognition, and natural language understanding.

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

A Neural Network is a computational model inspired by the human brain, made up of layers of interconnected neurons. Each neuron processes inputs and passes the result to the next layer. Neural Networks are capable of learning patterns and making decisions based on input data.

**Type of Neural Networks**:

* **Artificial Neural Network (ANN):** Used for general classification and regression problems.
* **Convolutional Neural Network (CNN):** Specialized for image-related tasks. Uses filters to capture features.
* **Recurrent Neural Network (RNN):** Designed for sequence data like text and speech, with feedback connections.

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

CNN, or Convolutional Neural Network, is a deep learning model mostly used for image and video recognition. It works by automatically detecting patterns such as edges, textures, and objects within images using convolutional layers. CNNs 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.**

The fire detection project pipeline includes several key steps:

* **Data Collection & Data Loading:** collect the dataset which are relatable to this project from various Open Source websites like (**Kaggle.com**).It has three dataset that is train, test, validate.
* **Image Preprocessing:** Resizing images to a standard size and applying augmentation (rotation, flip, zoom).
* **Model Development:** Building a CNN using TensorFlow/ Keras to classify images.
* **Model Evaluation:** Testing performance using validation and test datasets, tuning the model for better accuracy.
* **Deployment:** Saving the model, testing with real-world images, and deploying it as an app or API.