**WEEK 1 ASSIGNMENT - FOREST FIRE DETECTION**

1. **WHAT IS DL?**

Deep Learning (DL) is a subset of machine learning that involves the use of artificial neural networks with multiple layers to automatically learn patterns and features from large and complex datasets. Inspired by the structure and functioning of the human brain, deep learning models are capable of processing raw data such as images, text, or audio, and extracting useful representations without the need for manual feature extraction. It excels in tasks like image recognition, natural language processing, and speech recognition, especially when provided with large amounts of data and computational resources.

1. **WHAT IS NEURAL NETWORK AND ITS TYPES?**

A neural network is a computer system designed to work like the human brain, made up of layers of connected "neurons" that can learn from data. Each neuron receives input, processes it, and passes the result to the next layer. Neural networks are used in deep learning to recognize patterns and make decisions. There are different types of neural networks, such as Feedforward Neural Networks (FNN), where data flows in one direction; Convolutional Neural Networks (CNN), mainly used for image processing; Recurrent Neural Networks (RNN), which handle sequences like text or speech; and Generative Adversarial Networks (GANs), which can generate new data like images or music. Each type is suited for different tasks depending on the kind of data and the problem to be solved.

1. **WHAT IS CNN IN SIMPLE WORDS?**

A Convolutional Neural Network (CNN) is a type of deep learning model specially designed to work with images. It can automatically detect patterns, edges, shapes, and objects in pictures by using special filters (called convolutional layers). CNNs help computers recognize things like faces, animals, or handwritten digits, much like how our eyes and brain work together to understand what we see. They are widely used in image recognition, object detection, and computer vision tasks.

1. **CREATE SHORT NOTES ABOT THE PIPELINE WE HAVE DISCUSSED IN A LECTURE.**

The project pipeline consists of several key stages to effectively build and evaluate a deep learning model. It begins with data collection and loading, where the wildfire dataset is sourced from Kaggle and imported into the environment for analysis. This is followed by image processing and augmentation, where the images are resized, normalized, and augmented (through techniques like rotation, flipping, etc.) to simulate various real-world scenarios and improve the model's robustness. The next stage involves building a Convolutional Neural Network (CNN) using TensorFlow, where the model architecture is defined and trained on the prepared dataset. Finally, the model undergoes testing and evaluation using performance metrics such as accuracy, precision, recall, and F1-score to assess its effectiveness in detecting wildfires from images.