WEEK1 ASSESSMENT- FOREST FIRE DETECTION:-

Q.1) What is DL?

DL stands for **Deep Learning**. Deep Learning is a subset of machine learning that uses artificial neural networks with many layers (hence "deep") to model and solve complex problem. Inspired by the structure of human brain, deep learning systems automatically learns features and pattern from large set of data, without the need for manual feature engineering.

Q.2) What is neural network? What is its type?

A neural network is a computational model inspired by the human brain. It consists of layers of interconnected neurons that process input data and learn to perform task like classification, prediction, or pattern recognition.

Basic Structure: -

1.Input Layer- Takes in the data.

2.Hidden Layer- Performs computations and extract features.

3.Output Layer- Produces the final result.

The mainly three types of Neural Network are as follows: -

1. **ANN (Artificial Neural Network):**
   - Basic type of neural network.
   - Data flows in one direction (i.e. from input to output).
   - Good for general tasks like classification or regression.
   - Doesn't remember past inputs.
     - Example: Predicting house prices.
2. **RNN (Recurrent Neural Network):**
   - Designed for sequential data (data that changes over time).
   - Has loops to remember past inputs (short-term memory).
   - Useful for tasks where order matters.
     - Example: Text prediction, language translation.

3. **CNN (Convolutional Neural Network):**
    - Specialized for image and video data.
    - Detect pattern like edges, shapes, and objects.
    - Uses filters to scan image and extract features.
        - Example: Face recognition, medical image analysis.

Q.3) What is CNN in simple words?

A Convolutional Neural Network (CNN) is a type of type of neural network mainly used to analyze images.

CNNs automatically find patterns in images (like edges, color, or shapes) using special layer called convolution layers. These patterns help the network understand what's in the image- like recognition a face, a cat, or a traffic sign.

Key Points:

- Works well with visual data.
- Uses filters to scan parts of an image.
- Learns to detect important features without manual input.

Example: A CNN can look at a photo and say, "That's a dog."

Q.4) Create short note about the pipeline.

The deep learning pipeline is a step-by-step process used to build and train a deep learning model:

1. **Data Collection:** Gather large, labeled datasets.
2. **Data Preprocessing:** Clean, normalize, and prepare the data (e.g., resizing images, tokenizing text).
3. **Model Selection:** Choose a suitable neural network (e.g., CNN for images, RNN for sequences).
4. **Model Training:** Feed data into the model and adjust weights using optimization (like backpropagation and gradient descent).
5. **Evaluation:** Test the model on unseen data using metrices like accuracy or loss.
6. **Tuning & Optimization:** Improve performance by adjusting hyperparameters or layers.
7. **Deployment:** Use the trained model in real-world application (e.g., apps, website).