**WEEK 1 - ASSESSMENT**

**PROJECT : Forest Fire detection using deep learning**

1.What is deep learning?

Ans: Deep learning is a branch of machine learning where computers learn to recognize patterns and make decisions by studying large amounts of data, similar to how humans learn from experience. It uses artificial neural networks, which are systems designed to mimic the way the human brain processes information. By going through many examples, deep learning models improve their ability to perform tasks like identifying objects in photos, understanding speech, or translating languages. This technology powers things like voice assistants, self-driving cars, and facial recognition systems.

2. What is Neural Network and its types?

Ans: A neural network is a computer system inspired by the human brain that tries to recognize patterns and solve problems. It is made up of layers of tiny units called neurons that are connected together. Each neuron receives information, processes it, and passes it to the next layer, helping the network learn from data and make predictions or decisions.

**Types of Neural Networks:**

1. **Feedforward Neural Network (FNN):**  
   Information moves in one direction — from input to output — without going backward. Used for simple tasks like image classification.
2. **Convolutional Neural Network (CNN):**  
   Specially designed to work with images. It detects features like edges, shapes, and colors to understand pictures.
3. **Recurrent Neural Network (RNN):**  
   Good for data that comes in sequences, like text or speech. It remembers previous information to make better predictions.
4. **Long Short-Term Memory Network (LSTM):**  
   A special kind of RNN that can remember information for a long time, useful in tasks like language translation or time-series forecasting.

3.What is CNN in simple words?

Ans: A Convolutional Neural Network (CNN) is a type of computer model that helps machines see and understand images by finding patterns like edges, shapes, and objects. It works step-by-step, first spotting simple features and then combining them to recognize complete pictures, like identifying a cat or a car.

4. Create short notes about the pipeline we have discussed in a lecture (Project : forest fire detection using deep learning)?

Ans: Project Pipeline: Forest Fire Detection

1. Data Collection and Loading
   * Collect images from sources like Kaggle.com.
   * Load data into Google Colab for processing.
   * Split data into training, validation, and testing sets.
   * Dataset Split: Train, Test, Validation folders organized by category.
2. Image Processing and Augmentation
   * Resize images to the same dimensions (e.g., 129×129).
   * Apply augmentation techniques to increase dataset size and variety.
3. Build CNN Model
   * Use TensorFlow to create a Convolutional Neural Network.
   * Train the model with the processed images.
4. Testing and Evaluation
   * Evaluate the trained model’s accuracy using the test set.
   * Perform binary classification (fire or no fire).