**ASSESSMENT**

**FOREST FIRE DETECTION USING DEEP LEARNING  
WEEK-1**

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1. **What is deep learning?**

In artificial intelligence, deep learning is an approach that mimics how the human brain processes information, enabling machines to perform tasks like perception, reasoning, and decision-making .

1. **What is Neural Network and its types ?**

A neural network is a function approximator composed of layers of nodes (neurons), where each node computes a weighted sum of inputs, applies a non-linear activation function, and passes the result to the next layer.

**Types:**

1. **ANN(Artificial Neural Network):**

In machine learning, an ANN is used as a predictive model that learns from labelled data , one or more hidden layers, and an output layer, where each neuron performs a weighted sum of inputs followed by an activation function to produce an output.

1. **RNN(Recurrent Neural Network):**

An RNN a deep learning model that is trained to convert a sequential data input into a specific sequential data output.

It is also a sequential data such as words, sentences, or time-series ,data is like a memory-based model it remembers past words, numbers, or actions while making decisions, making it great for language, speech, and time series tasks.

1. **CNN(Convolutional Neural Network):**

In machine learning, a CNN is an advanced neural network that learns local patterns in structured data (like pixels in an image) using filters that slide over input features, enabling efficient and accurate recognition.

It is deep learning model specifically designed to process and analyse visual data by automatically detecting spatial features like edges, shapes, and textures.

Other types:

1. Long Short-Term Memory Networks (LSTMs)
2. Generative Adversarial Networks (GANs)
3. Transformer Networks
4. Deep Belief Networks (DBNs)
5. Deep Q-Networks (DQNs)
6. Variational Autoencoders (VAEs)
7. Graph Neural Networks (GNNs)
8. **What is CNN in simple words?**

Convolutional Neural Networks (CNNs) are a specialized type of neural network specifically designed to process and analyse visual data by automatically detecting spatial features.

Inspired by the way the human brain processes visual information.

How CNNs Work:

* The network receives a pre processed image, usually resized and normalized for consistency.
* These layers apply filters (kernels) to the image to detect important features such as edges, textures, and patterns.
* These layers reduce the size of the feature maps, helping to lower computation while retaining important information.
* The reduced feature maps are flattened and passed through dense layers to perform higher-level reasoning.
* The final output is a prediction, such as identifying the object in the image (e.g., dog, car, tree).

1. **Create a short notes about the pipeline discussed in lecture:**

**Project pipeline:**

1. Data collecting and data loading
2. Image processing or Image augmentation
3. Build CNN
4. Test evaluate
5. **Data collecting and data loading :**

**Data collection :** collecting the data into the model in a structure**.**

**Data Loading :** feeding the collected data into the model.

**In this we use Kaggle dataset**

The image is fed into the CNN model and then it is validated called as training data after training it is tested for testing the accuracy.

1. **Image processing or Image augmentation:**

**Image processing:** It enhance images to prepare them for tasks like analysis, classification, or detection.

**Image augmentation:** It generate multiple copies of image either it may rotate, shift etc

1. **Build of CNN:**

It is build using Tensorflow to classify images.

TensorFlow is like a powerful toolbox that helps computers learn from data and make smart decisions — just like how humans learn from experience**.**

1. **Test evaluate:**

Feeds the test data into the model

Calculates how well the model performs

Reports accuracy and loss