Deep learning (Assesment)

Qn.1) (a) Explain how you can implement DL in a real-world application.

(b) What is the use of Activation function in Artificial Neural Networks? What would be the problem if we don't use it in ANN networks.

Ans)

Deep Learning (DL) is a powerful subset of machine learning that utilizes artificial neural networks to learn from vast amounts of data. Implementing DL in real-world applications involves several key considerations:

1. Data Dependencies
2. Hardware Dependencies
3. Feature Engineering Process
4. Model Training and Execution Time
5. Black-box Perception and Interpretability

Activation Function in Artificial Neural Networks

Activation functions play a crucial role in Artificial Neural Networks (ANNs) by introducing non-linearity into the network, enabling it to learn complex patterns and relationships in data. The primary uses of activation functions in ANNs are:

1. Introducing Non-Linearity: Activation functions introduce non-linear transformations to the input data, allowing neural networks to model complex relationships between inputs and outputs.
2. Enabling Gradient Descent: Activation functions help in backpropagation by providing gradients that guide the optimization process during training.

Importance of Activation Function

If activation functions are not used in ANN networks, several problems can arise:

1. Loss of Expressiveness: Without activation functions, neural networks would reduce to linear models, limiting their ability to learn complex patterns and non-linear relationships in data.
2. Vanishing Gradient Problem: Activation functions help prevent issues like vanishing gradients during backpropagation, ensuring effective learning and convergence of the network.
3. Activation functions are essential components in ANNs that enable them to learn complex patterns and relationships within data efficiently. Their absence can lead to significant limitations in the network's learning capacity and optimization process