**Deep Learning**

**Question 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.

**Solution 1**

As DL is an subfield of AI Deep learning (DL), a powerful subfield of artificial intelligence (AI), has revolutionized various sectors with its ability to learn complex patterns from vast amounts of data.

Here is an example of the this

1. Image Recognition and Computer Vision

2. Natural Language Processing (NLP)

3. Speech Recognition and Generation

4. Recommendation Systems

5. Anomaly Detection and Fraud Prevention

This all the are the example of the deep learning now a days deep learning are most popular in a field of machine learning

I am working in a field of deep learning recently all my project are belongs from deep earning section this is really to help ful for the companies and work stations

The Importance of Activation Functions in Artificial Neural Networks (ANNs)

Activation functions are essential components of ANNs that introduce non-linearity. Without them, multiple layers of linear transformations in ANNs would simply create a single linear function, unable to learn complex patterns. Activation functions introduce non-linearity, allowing the network to learn intricate relationships between input features and output labels.

**Sigmoid:** Outputs values between 0 and 1, suitable for binary classification problems. However, it can suffer from vanishing gradients in deep networks.

**Tanh:** Outputs values between -1 and 1, often used for regression problems or as a hidden layer activation function.

**ReLU (Rectified Linear Unit):** Outputs the input directly if it's positive, otherwise outputs zero. It's a popular choice due to its efficiency and ability to mitigate vanishing gradients.

**Leaky ReLU:** A variant of ReLU that allows a small non-zero gradient for negative inputs, addressing the "dying ReLU" problem where

**Question 2**

Train a Pure ANN with less than 10000 trainable parameters using the MNIST Dataset

**Solution 2**

**On :- DL Question 2.ipynb**

**Question 3**

Perform Regression Task using ANN

**Solution 3**

**On :- DL Question 3.ipynb**