GENERATIVE TRANSFORMER-WIDS

The basic idea of this project was to study the vast applications and use cases of neural networks in our lives. These are similar to the neurons in human body in which activation of one neuron activates the following and transmits information from one part to another. Similarly one neurons output acts as the input of the next layer of neurons and the process is continued to achieve the final output.

We started with learning about python and its libraries like matplotlib, numpy, pandas , google collab and git as well.

Matplotlib helps us to make plot with the data given. Many modifications related to scale, plotting many line graphs on a single graph can be done using it. Numpy helps to make arrays and perform many functions on those arrays.

Following this we learnt about neural networks. The simplest type is feedforward where the information flows only in 1 direction and there are no loops.

In this neural network, the inputs are fed in and they are assigned random weights and biases. The weighted sums are calculated and fed to an activation function. This is carried out for all layers and the outputs are produced. To train the network to produce the desired outputs, it undergoes back propagation where the weights and biases are modified according to the loss in the outputs produced as against the desired outputs. this is looped for many iterations to train the model

After this we learnt about the library Tensorflow and implemented the basic neural network.

Tensorflow has inbuilt functions for implementing deep neural networks. Using this we tried to solve the problems like MNIST handwritten digit classifier using inbuilt layers in Tensorflow, MNIST handwritten digit classifier using custom layers in Tensorflow, Boston housing prices. In the first 2 problem, the pixels are given values between 0 to 1 and based on the pixels values the digit is recognised. The 3rd problem involves data set of median house price, price per square foot, historical price trends, market reports neighbourhood characteristics etc, to determine the best suited house for one’s requirements.y

The following week we implemented a transformer capable of generating text in Shakespearean prose.

 In this after giving certain words of Shakespearean prose, the transformer was able to auto fill the next 1000 letters of the prose. It is able to generate text by predicting the next character in a sequence and thus completing the part of the prose.

The data is encoded into integers to train the model more easily. It then splits the encoded data into training and testing sets. The transformer model is then made and the data is fed into it. The integers are decoded to letters to finally get the Shakespearean prose.