Practical 2

Aim :-

Classification using Deep Neural Network : Binary classification using deep neural network : Classify movie reviews into 'positive' reviews and 'negative' reviews just based on text context of the review use IMDB dataset.

Dataset Description :-

We will use IMDB dataset which contains 50,000 movie reviews that are labelled as 'positive' or 'negative'. The dataset is split into 25000 reviews for training and 25000 review for testing.

Objectives :-

i) To implement different deep learning models.
ii) To understand hardware acceleration
iii) To illustrate concepts of Artificial Intelligenc Machine learning (AI/ML).

Requirements :-

64 bit windows o.s, python
python libraries - Numpy, scikit learn, keras
Tensorflow.
Jupyter notebook.

Theory:-

Binary Classification:-
Binary classification is a type of machine learning problem where the task is to classify data into two categories.
In this practical assignment, we will use Deep Neural Network to perform binary classification of movie review based on their text context.

Deep Neural Networks are a type of machine learning model that are capable of learning complex patterns of data.

In machine learning, binary classification is a supervised learning algorithm that categorizes new observations into one of two classes.

Algorithm:-

1) Load the dataset using built-in function in keras.

2) Pre-process the dataset by converting the integer sequence into a binary matrix using one-hot encoding

3) Split the training dataset into training and validation sets.

4) Implement a deep neural network with following architecture:

  - An embedding layer to convert the integer sequence into desire vectors of fixed size

  - Two dense layers with ReLU activation function.

  - A final dense layer with a sigmoid activation function to output probability for 'positive' or 'negative.'

5) Train the model using Adam optimizer and binary cross-entropy loss function.

6) Evaluate the model on the test dataset and report the accuracy and loss.

7) Experiment with different hyper parameters such as number of hidden units and learning rate and evaluate the model performance.

8) Solve the trained model for future use.

9) END.

Conclusion:-

Hence, we have successfully implemented binary classification for IMDB dataset.