DYP

Assignment No: 2.

Title : Classification using deep neural network.

Objective : To understand classification using Deep Neural Network using Binary classification

Problem Statement : Binary classification using Deep Neural Network using Binary classification example: movie reviews into positive reviews and negative reviews just based on text content of the reviews, use IMDB Dataset.

Software and Hardware Requirement -
① PC / Laptop.
② Jupyter
③ C fromse.

Theory :
Neural Network :
The main purpose of neural network is to try to find the relationship between features in a dataset and it consists of a set of algorithms that mimic the work of human brain. A 'neuron' in a neural network is an mathematical function that collects and classifies information according to specific architecture.

Binary classification with neural network :
Deep learning can be used for binary classification too In fact, building a neural network that acts as a binary regressor. In this post, you will learn how to use keras to build binary classifier. Building a neural

network that performs binary classification involves making two simple changes.

Binary cross Entropy:-
It is a model metric that tracks incorrect labelling of data class by a model, penalizing the model if derivations in probability occur into classifying the labels. Low log loss values equate to high accuracy values.

$$-\frac{1}{N}\sum_{i=1}^{N} y_i \cdot \log(p(y_i)) + (1-y_i) \cdot \log(1-p(y_i))$$

$p(y_i)$ → is the probability of one
$1-p(y_i)$ → is the probability of zero.

Algorithm for Binary Classification:

Step 1- Load the libraries and dataset.
Step 2- Define explanatory and target variables.
Step 3- Split the dataset into training and testing tests.
Step 4- Normalise the data for numerical stability.
Step 5- logistic regression model to the training data.
Step 6- Make predictions on the testing data.
Step 7- Calculate the accuracy score by comparing the actual values and predicted values.
Step 8- Display the output.

Libraries used:
1) keras: keras is a deep learning API written in python, running on the top of machine learning platform Tensor flow.

2) Model Class: keras models define how to organize layers. There are two types of keras model. Namely sequential and functional API.

3) Sequential:
The core idea of sequential API is simply arranging the keras layers in a sequential order and so it is called sequential API.

4) Optimizers: It is an algorithm or function that adapts the neural network, attributes like learning rate and weights. Hence, it assists in improving the accuracy and reduces the total loss.

5) Layers: A layer is the highest level building blocks in deep learning. A layer is a container that usually receives weighted input, transform it with a set of mostly non-linear functions.

6) Metrics: A metrics is an function that is used to judge the performances of your model. Metric functions are similar to loss function, except that the results from evaluating a metric

Conclusions:
We, have successfully implemented the Binary Classification on movies reviews as positive and negative.