

A Summary Report
on
Summary Report: Implementation of Neural Network

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Project Objective

Creating and implementing a neural network model that can analyze the sentiment of movie reviews from the IMDb dataset is the aim of this project. Sentiment analysis is the process of identifying and classifying the sentiments expressed in a text, in this case, movie reviews, as either positive or negative. Using a labeled dataset of movie reviews, the neural network will be trained to categorize them according to their sentiment. In order to enable the model to accurately predict the sentiment of movie reviews it has not encountered during training, it is intended to develop a reliable and accurate model that can generalize well to unseen data. The goal of this project is to use deep learning techniques—specifically, TensorFlow and Keras frameworks—to accomplish the intended

Imported Libraries and Frameworks:

To implement deep learning models, TensorFlow was imported along with its high-level API, Keras.

Dense and Dropout, two essential layers for building neural network architectures, were imported from Keras.

Model Architecture:

Layers were added to a sequential model starting at the beginning.

The neural network was composed of an output layer with a single dense unit and sigmoid activation function, and three hidden layers, each with 32 dense units and a tanh activation function.

Model Compilation:

The mean squared error (MSE) loss function, accuracy as the metric, and the Adagrad optimizer were used in the compilation of the model.

This case used mean squared error loss, even though binary cross-entropy is frequently used for binary classification tasks.

Data Splitting:

To track the performance of the model during training, the data was divided into training and validation sets.

Model Training:

With a batch size of 256, the neural network was trained for 20 epochs, and the performance of the model was evaluated at each epoch using the validation data.

Regularization Techniques:

While L1 and L2 regularizers were tested, their influence on validation accuracy was not very great.

The model was trained and assessed using TensorFlow/Keras, which gave insights into how well it performed on the IMDb movie review dataset. Although different configurations and methods

were investigated, the ultimate architecture managed to attain a certain degree of validation accuracy.

Conclusion:

Here's a rephrased version of the provided points:

The neural network architecture is composed of three layers.

Tanh activation functions are employed instead of ReLU.

The Adam optimizer is utilized instead of RMSprop.

Both L1 and L2 regularization techniques are applied.

A dropout layer with a dropout rate of 0.5 is incorporated, implying that 50 percent of inputs are randomly dropped during training.

Through these adjustments, a final accuracy of 99.39 and a validation accuracy of 87.2 are attained