**Python/Deep Learning\_Lab2 Report**

**Team Members (10)**

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***Introduction***

This lab focuses on Deep Learning concepts. In this, we had implemented image classification with CNN, text classification with CNN and LSTM, Logistic Regression and Linear Regression.

***Objective****:*

To implement below tasks:

1. Linear Regression
2. Logistic Regression
3. Text Classification with CNN
4. Text Classification with LSTM
5. Compare 3 and 4 results
6. Image Classification with CNN

***Requirements****:*

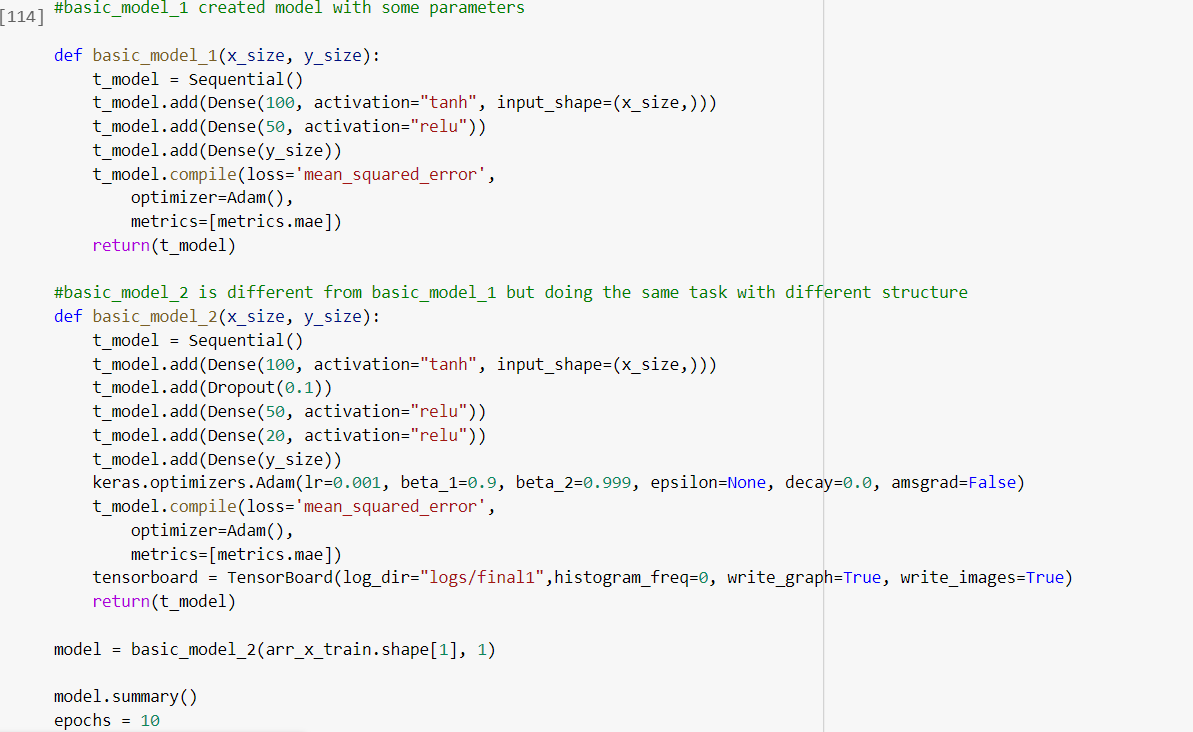
1. Google Colab
2. Python 3.7
3. Anaconda Interpreter
4. Keras
5. TensorBoard

***WorkFlow****:*

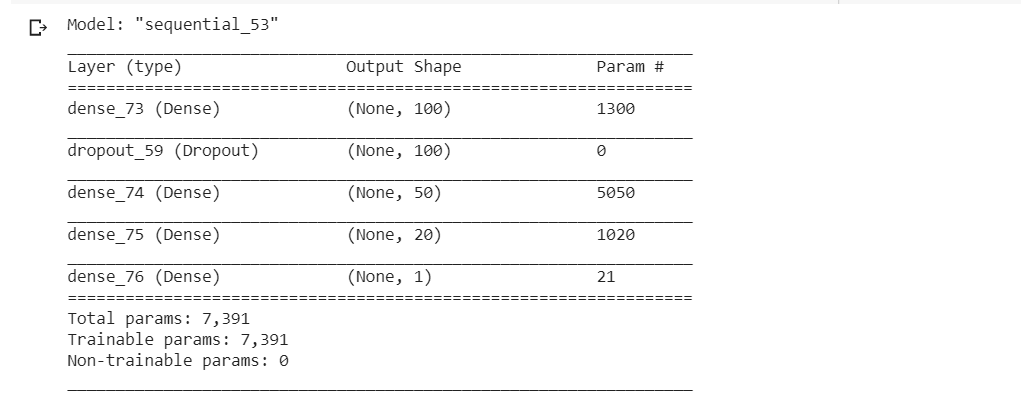
**Task 1:-**

Building Sequential model using keras implement Linear Regression & plotting a Tensor-Board & plotting loss and tuning hyperparameters lets us note how accuracy and mean absolute error changes for each case.

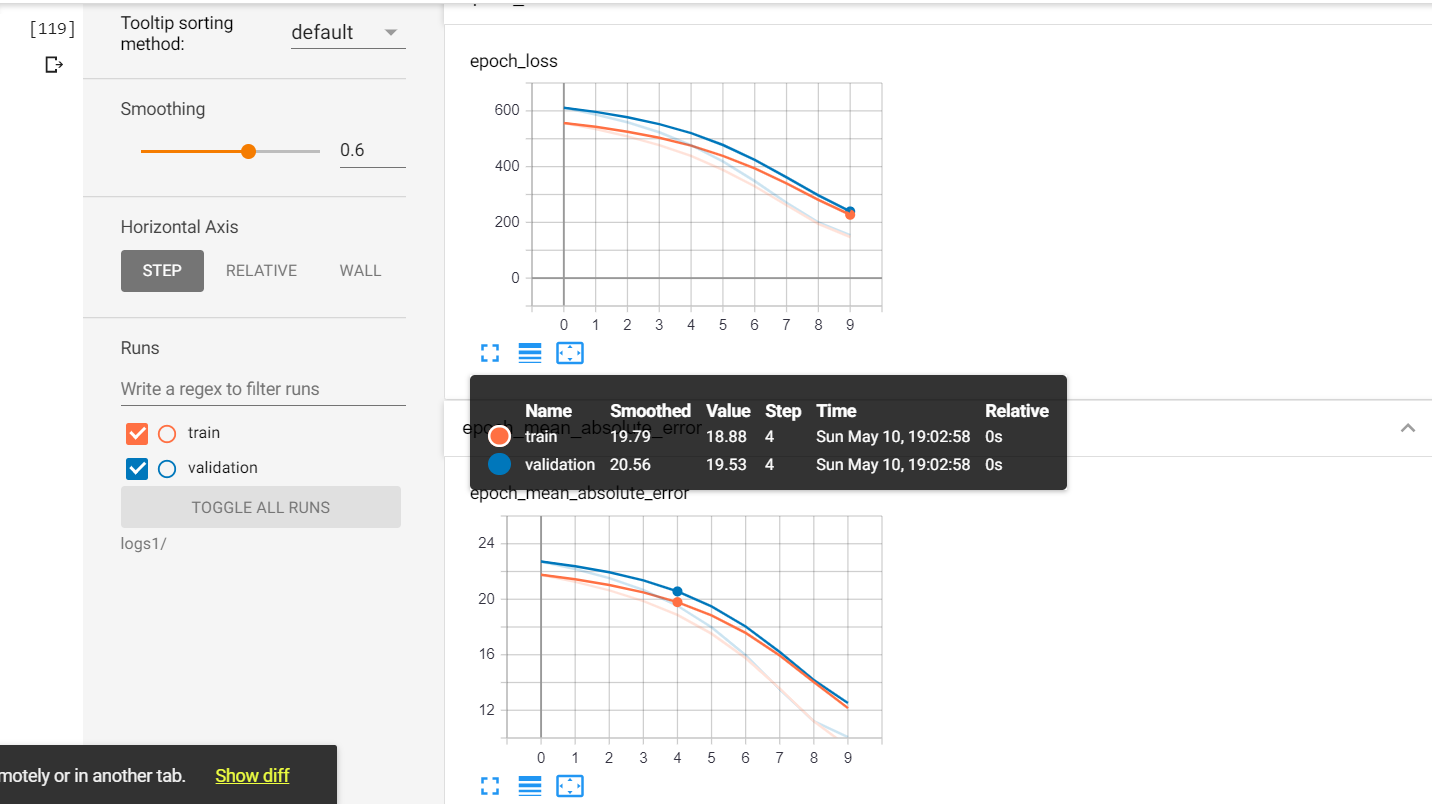
**Code & Output :--**



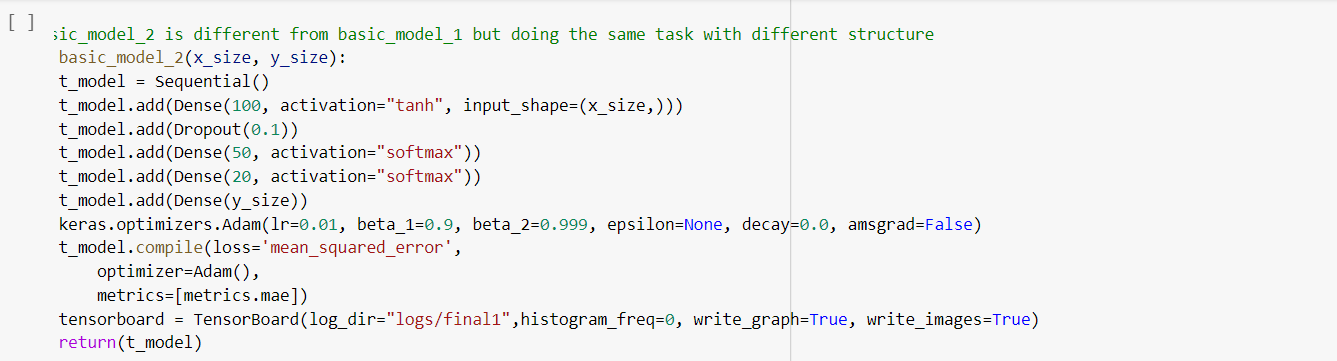


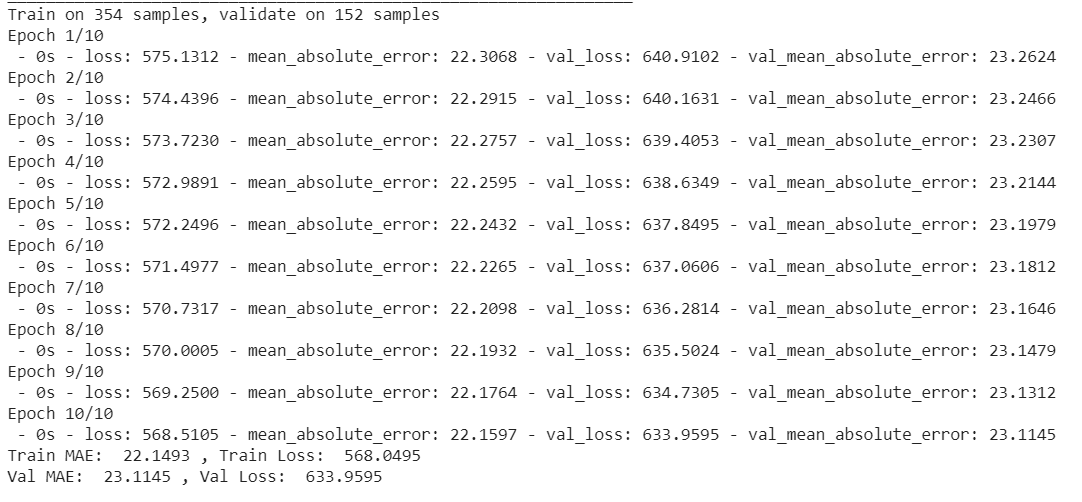


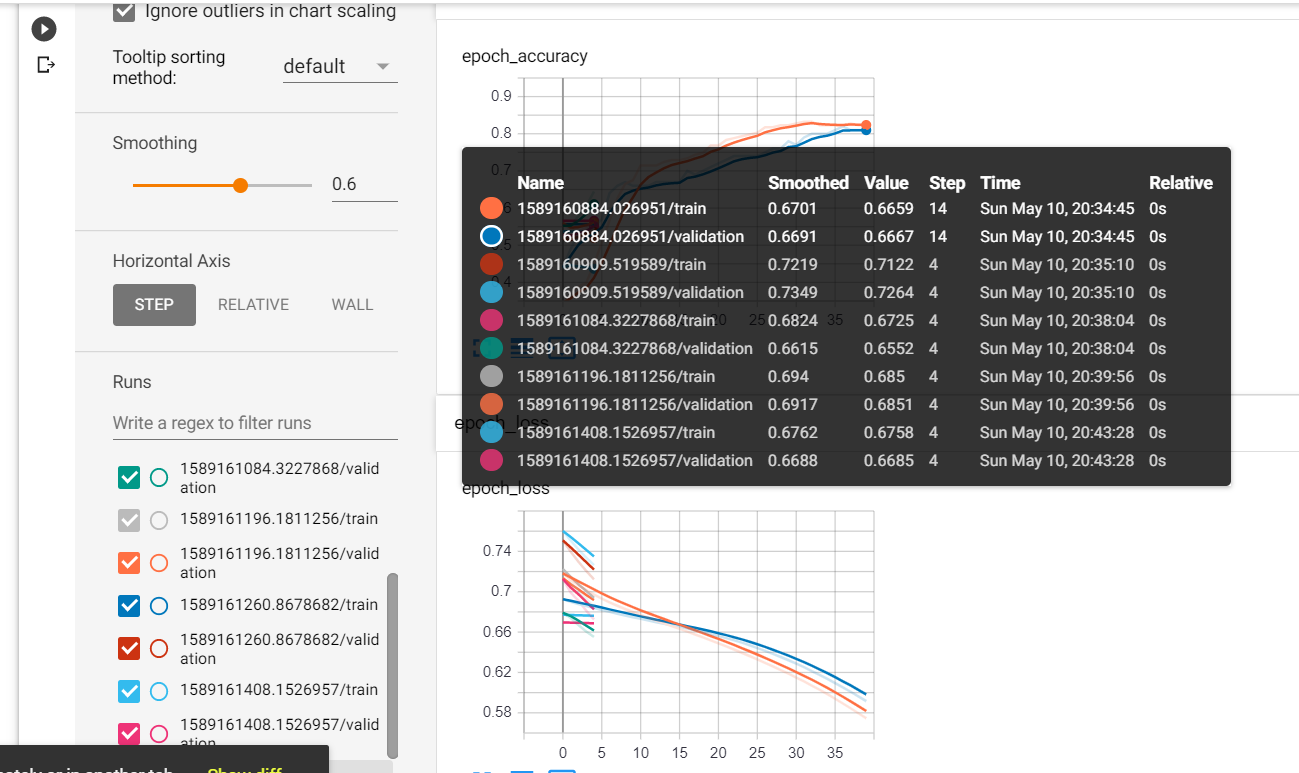




Changing Learning rate to 0.01

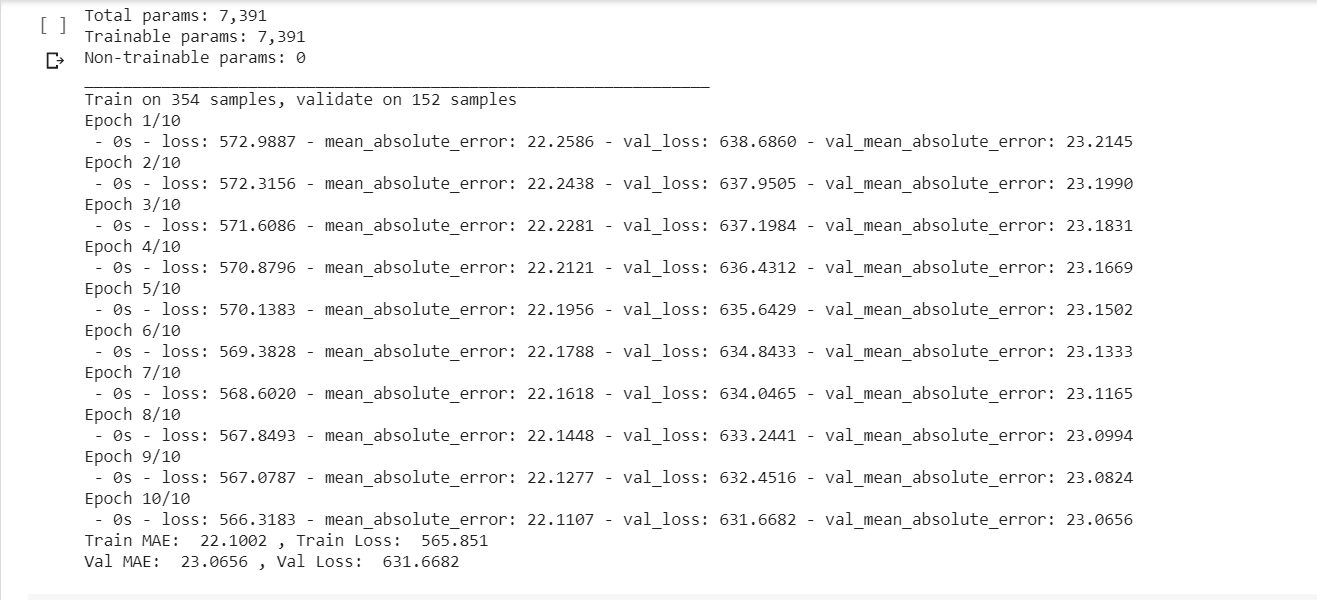


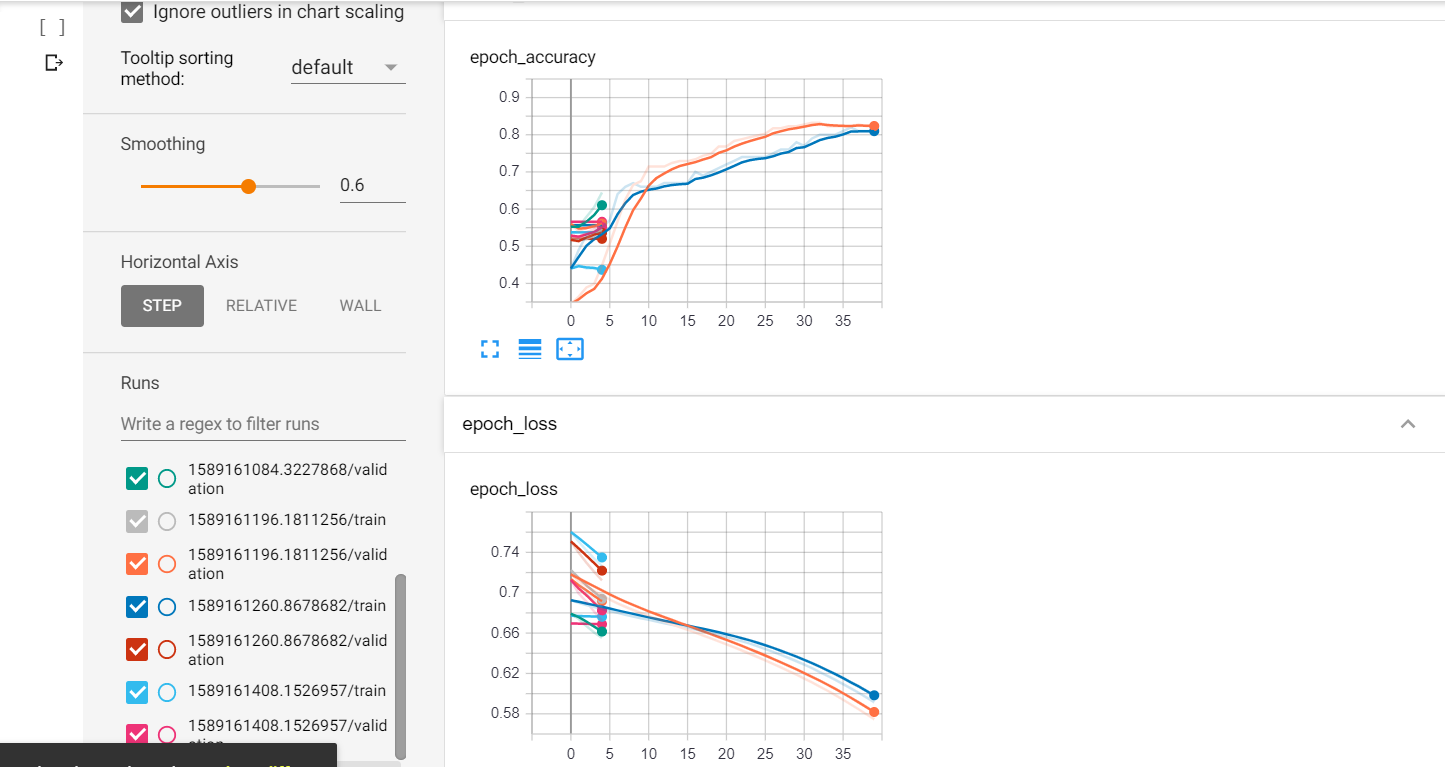




Changing activation layersoftmax:



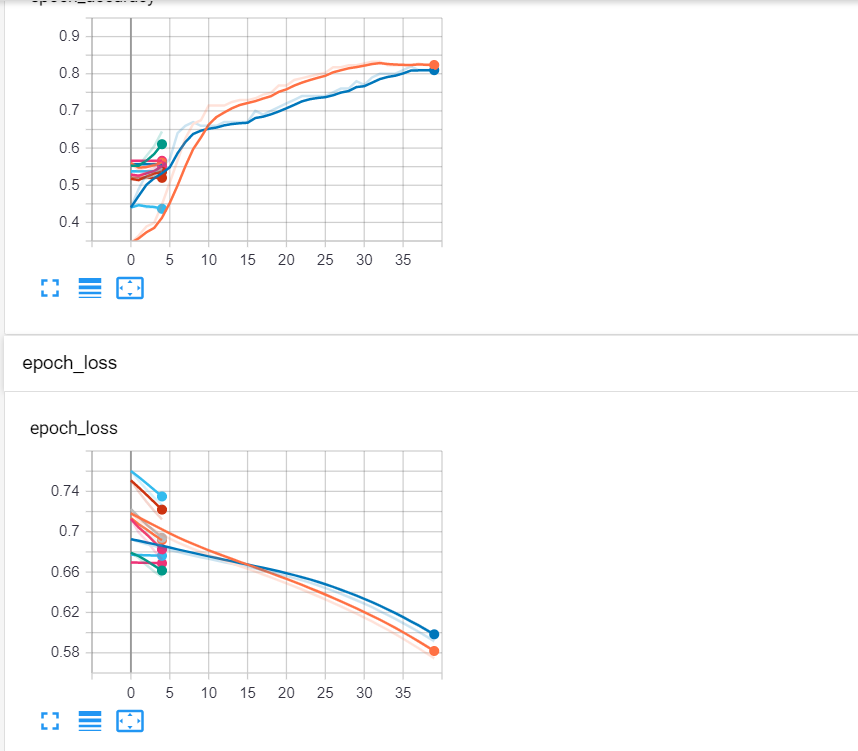




Changing Batch Size to 128:





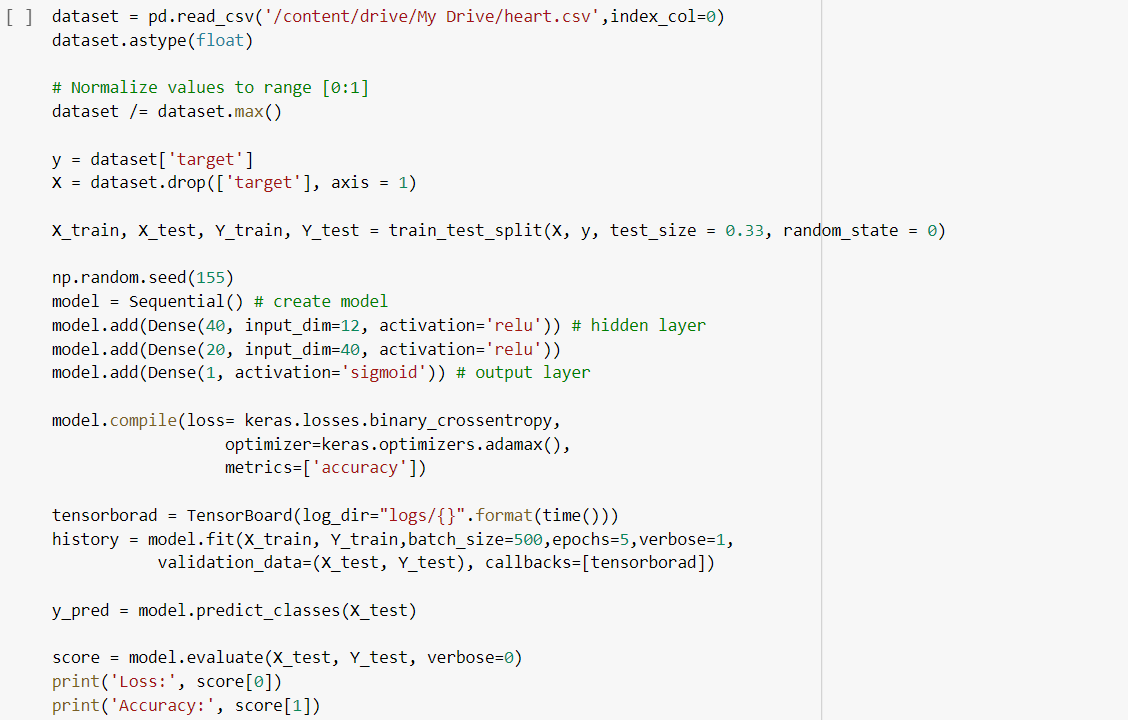


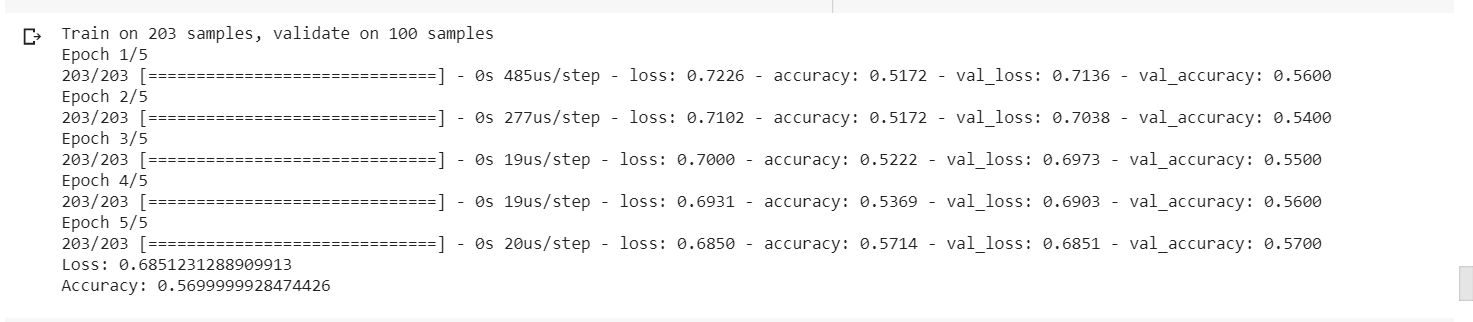
Hence, we can clearly say that by tuning each hyper parameter the loss and error varies. So, the accuracy also varies.

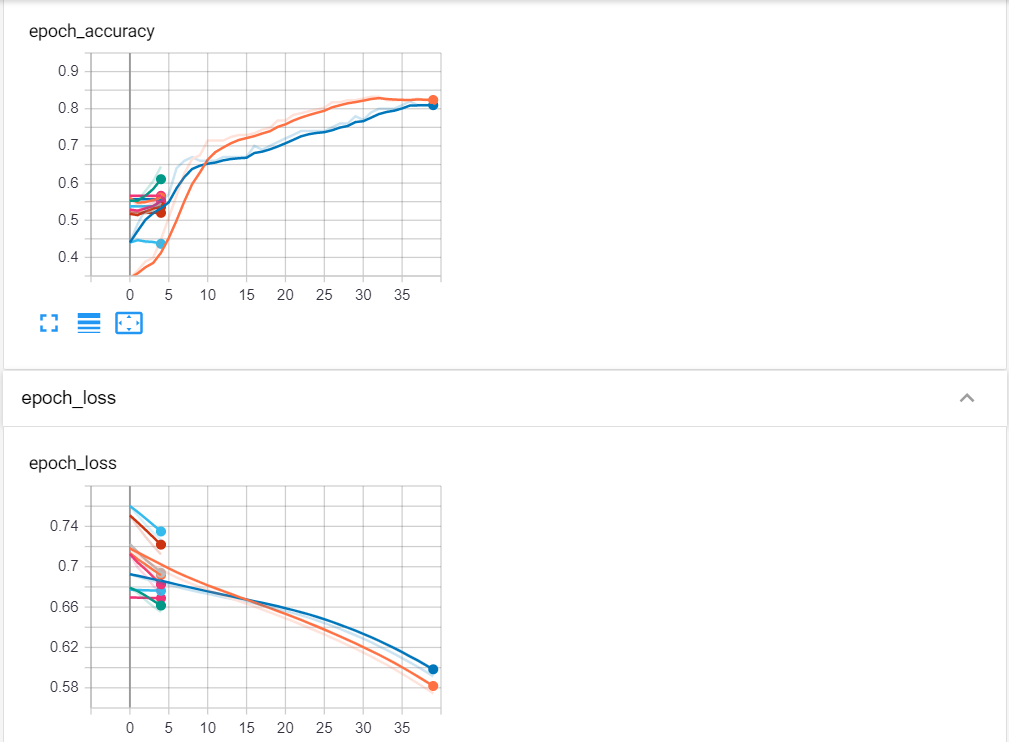
**Task 2:-**

Implementing Logistic Regression and by tuning the hyper parameters in each case lets see how the loss and accuracy changes in each case.

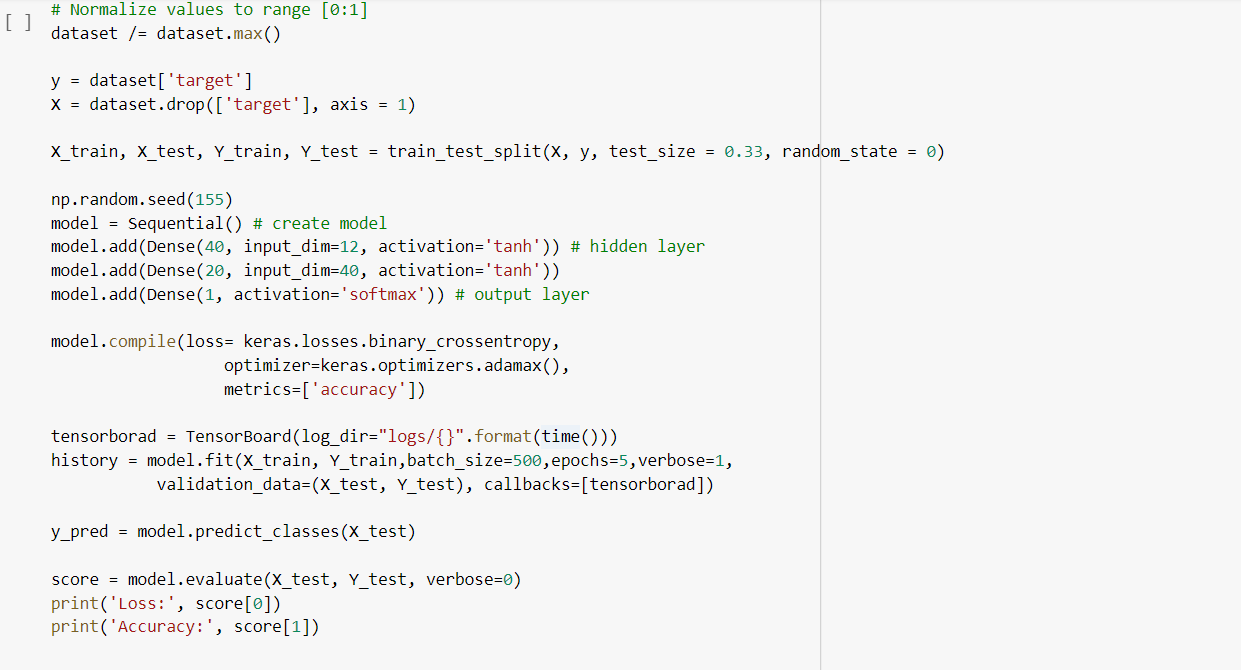
**Code & Output :--**

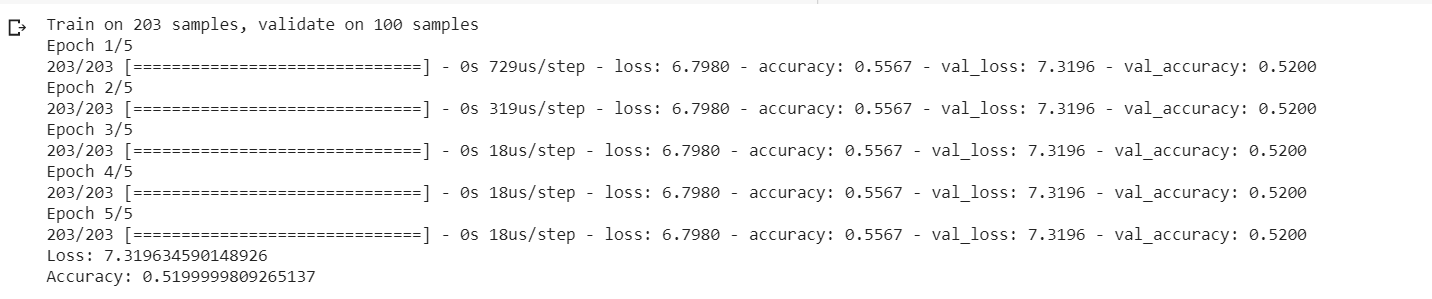


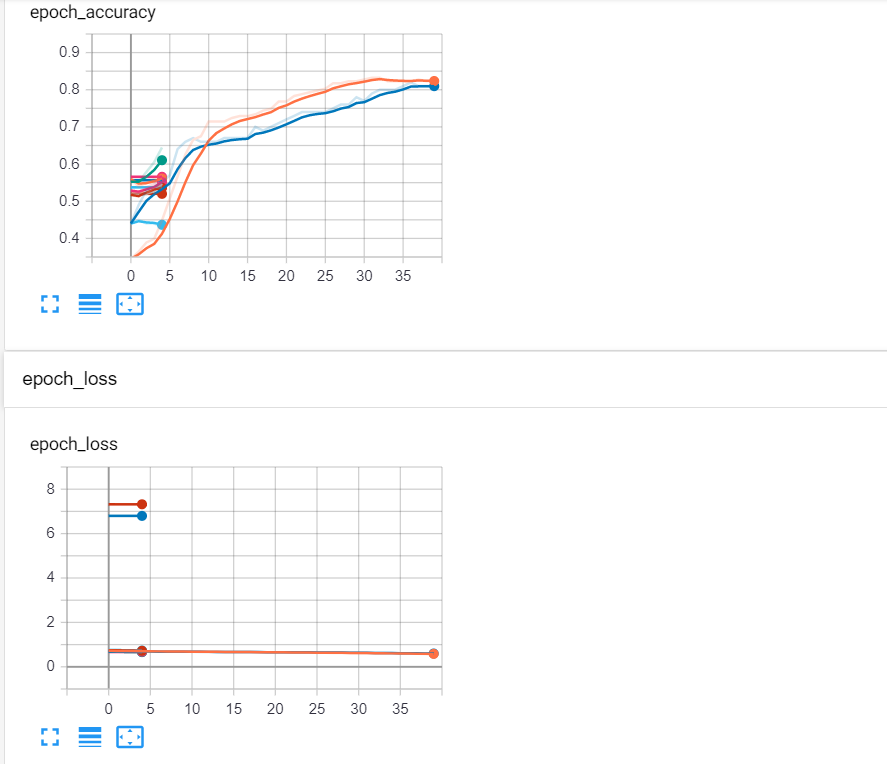




By Changing the Activation function to Tanh:

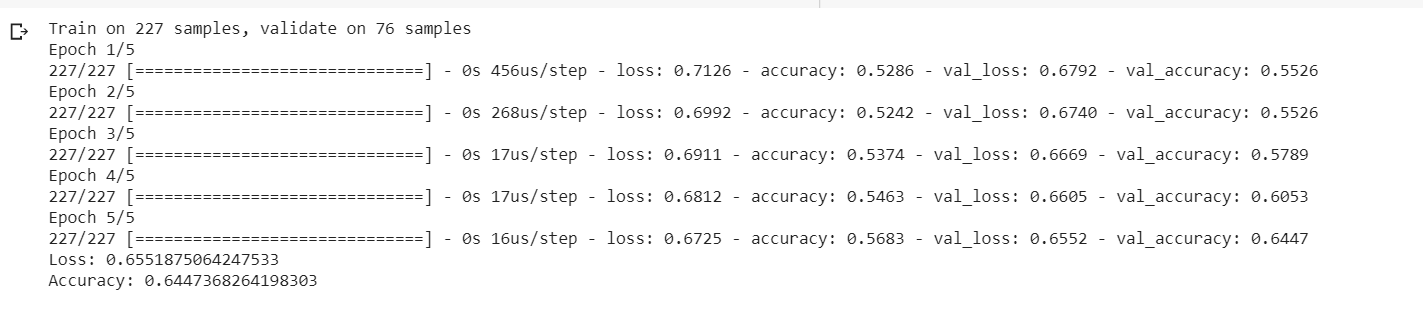


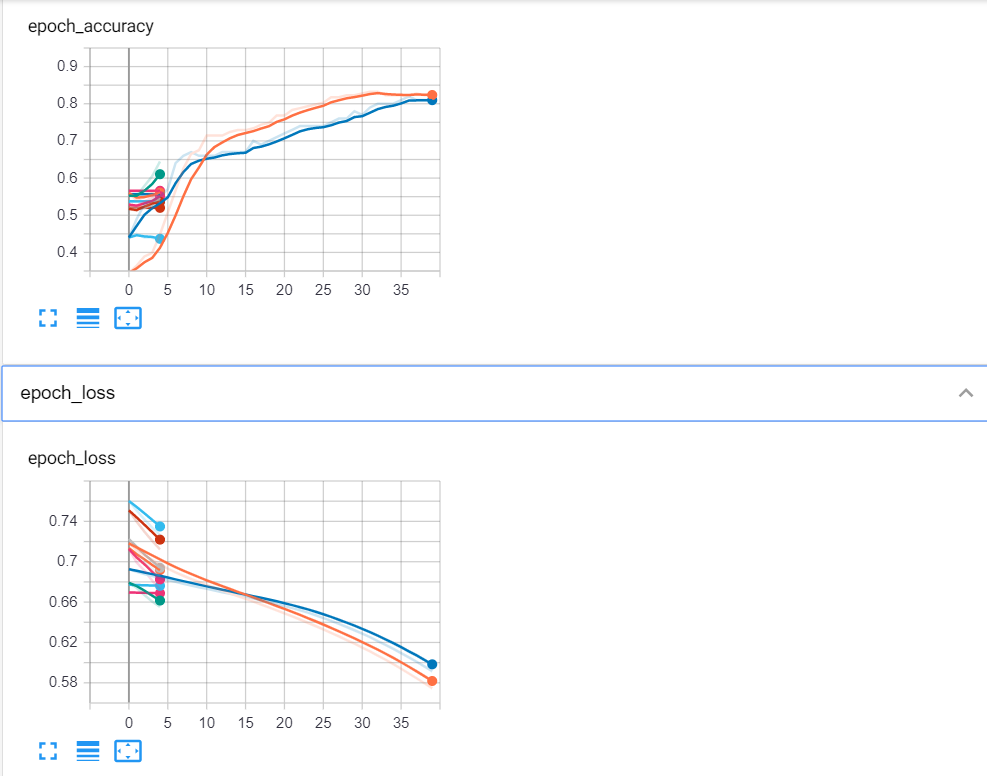




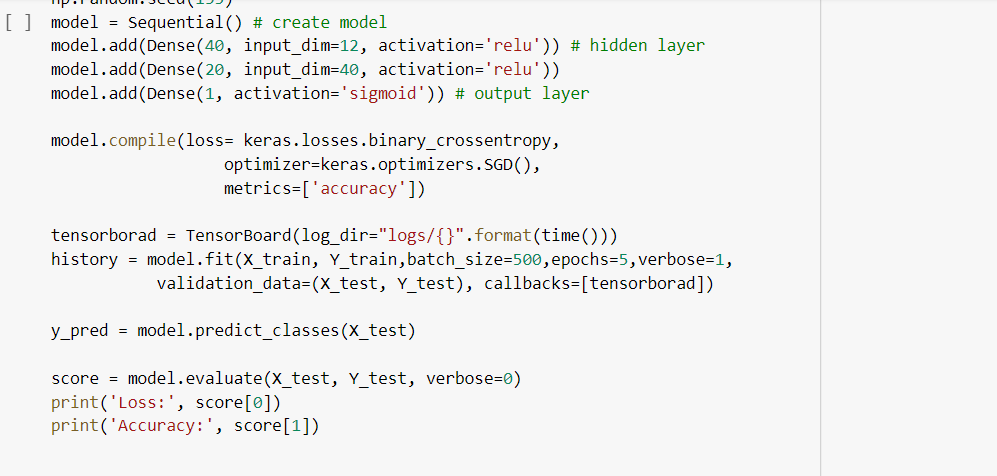
By Changing the test size to 0.25:

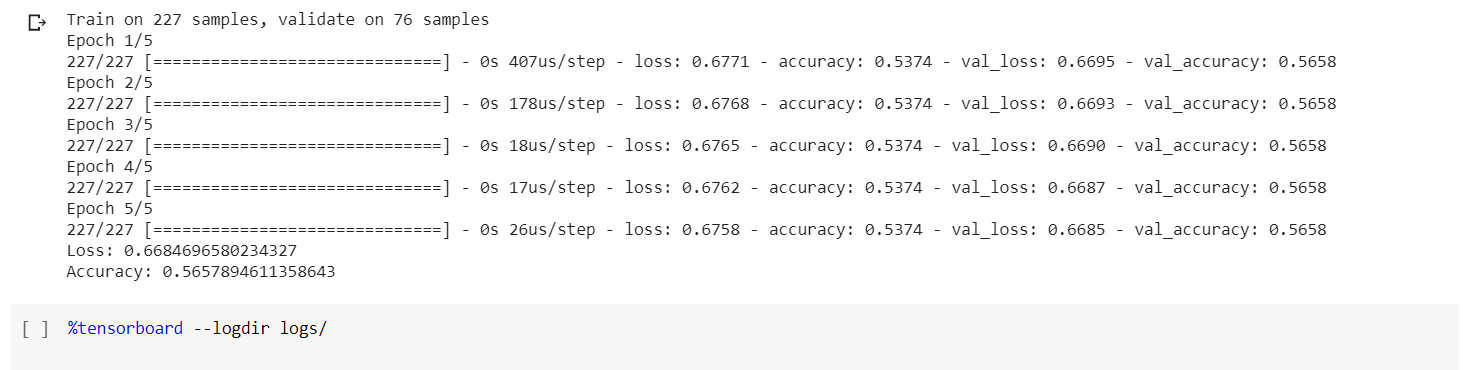


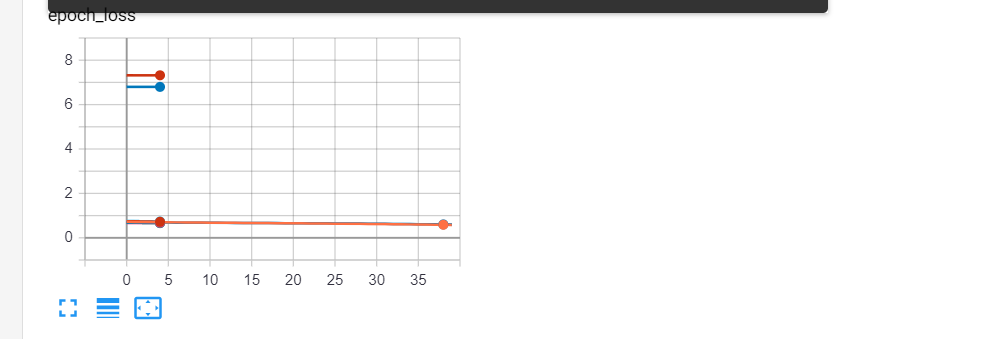




Changing the optimizer to SGD:







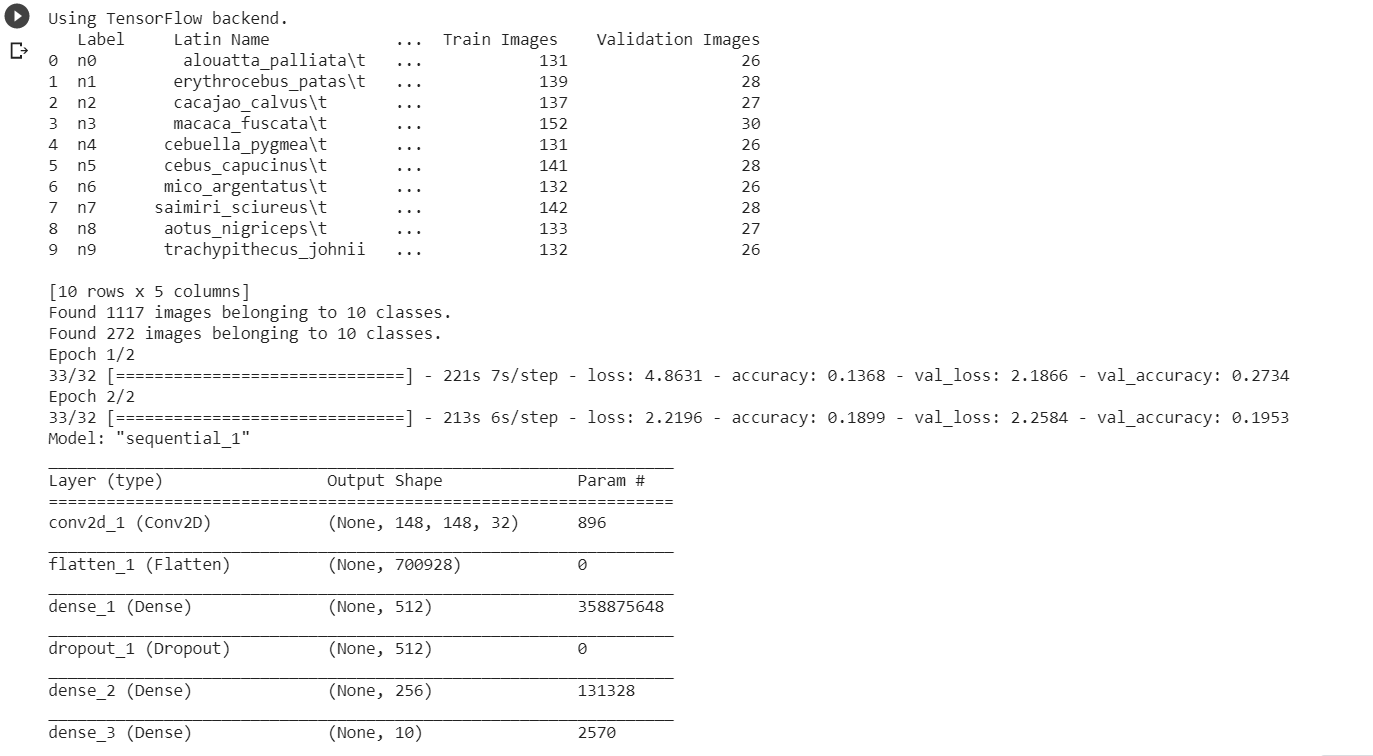
**Task3:-**

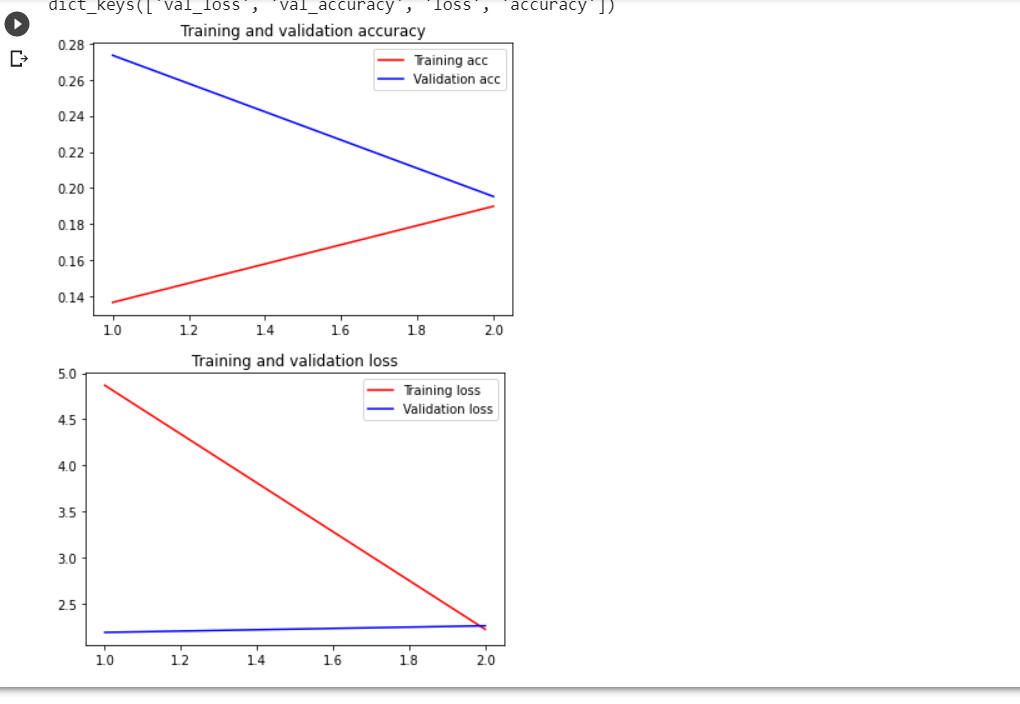
Implementing Image Classification with CNN Model with Monkey Variety Data set from Kaggle.

We had classified the different variety of models by building a conv\_2d model.

**Code & Output:-**







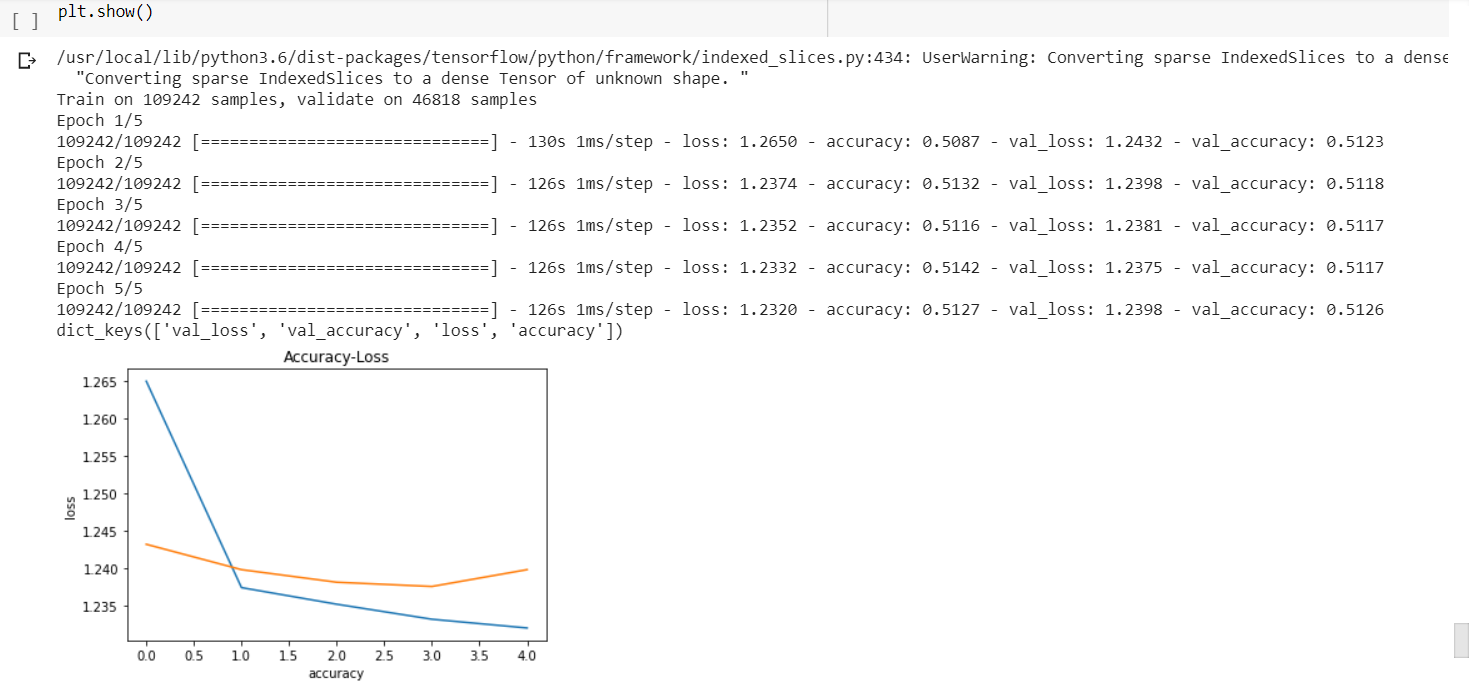
**Task4:--**

Implementing\_text\_Classification\_with\_CNN\_Model of movie review dataset.

**Code & Output:-**







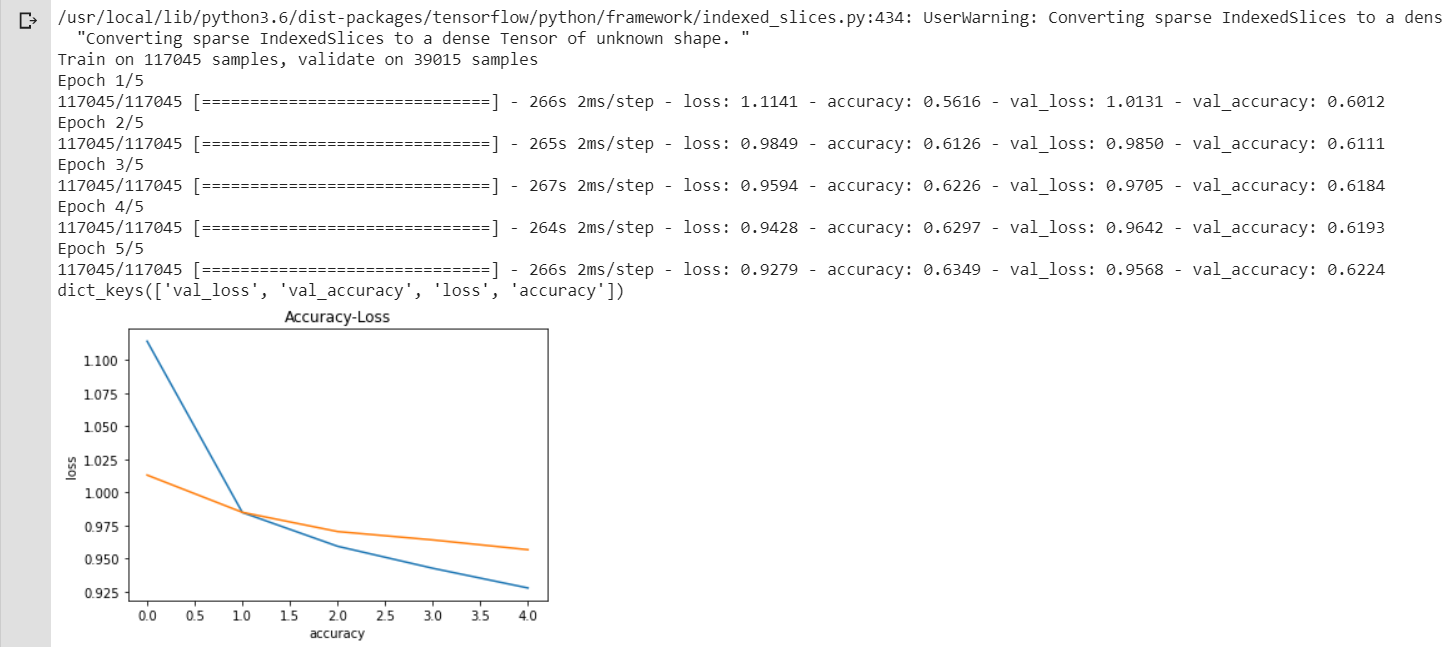
**Task5:-**

Implementing text Classification with LSTM Model and performing sentimental Analysis:

**Code & Output:-**







**Task6:--**

Comparing\_the\_results\_of\_CNN \_ and\_LSTM\_Model\_for\_text classification.

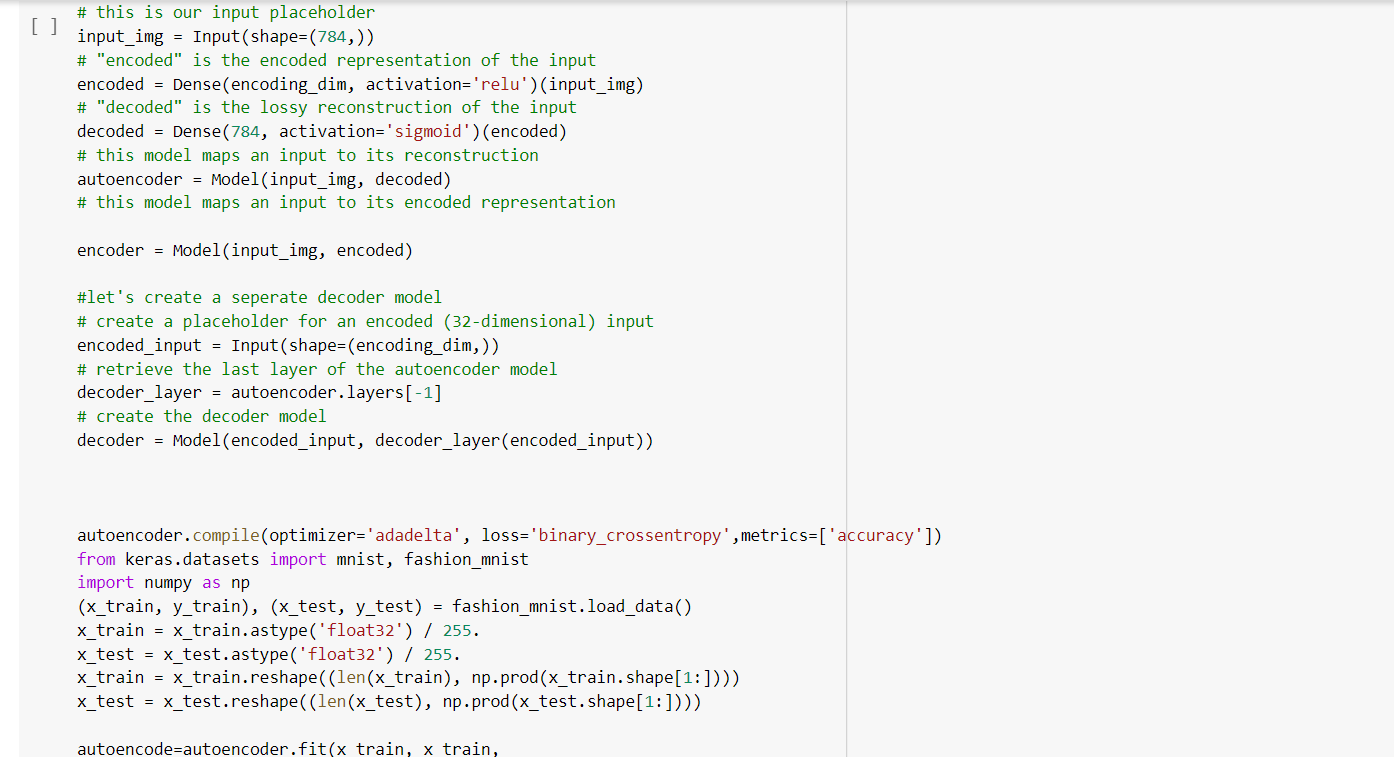
Tune\_Parameters\_to\_Attain\_Best\_Accuracy.

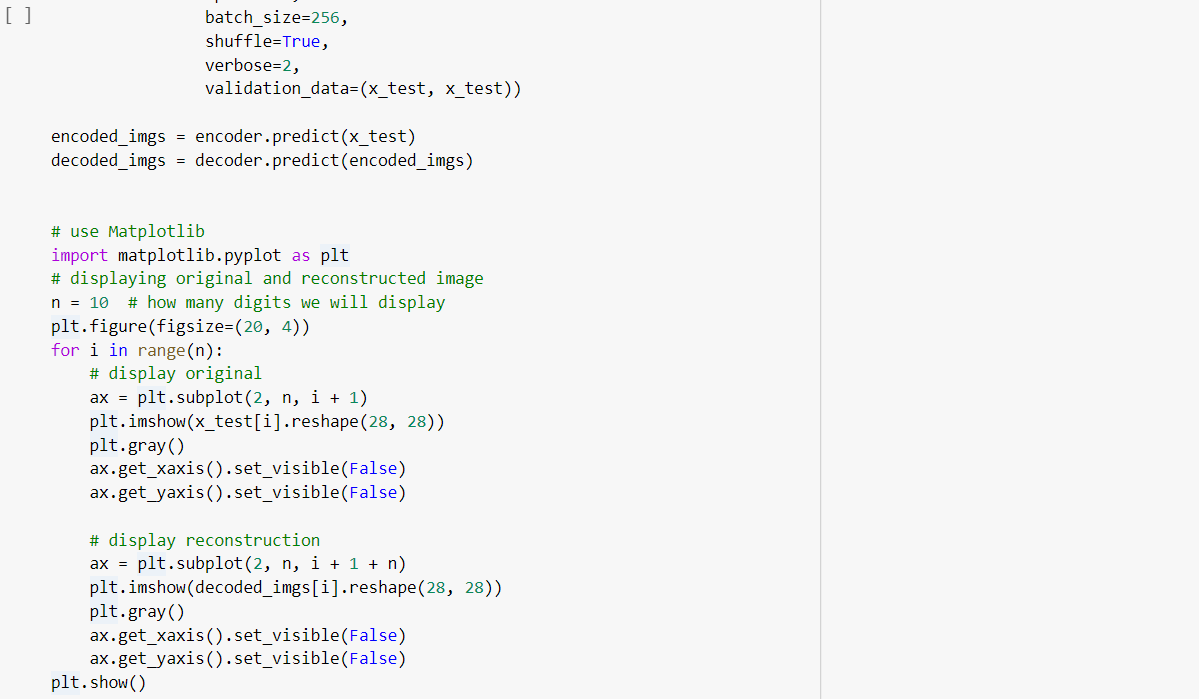
From the above 2 results we can see that the accuracy for LSTM model is higher compared to CNN model. As we are dropping the features recurrently in LSTM, the accuracy is higher. LSTM is slow for which it gives different accuracies for each time the text is given as input, where it trains for each continuous text data feed. So, LSTM model is better for text classification compared to CNN.

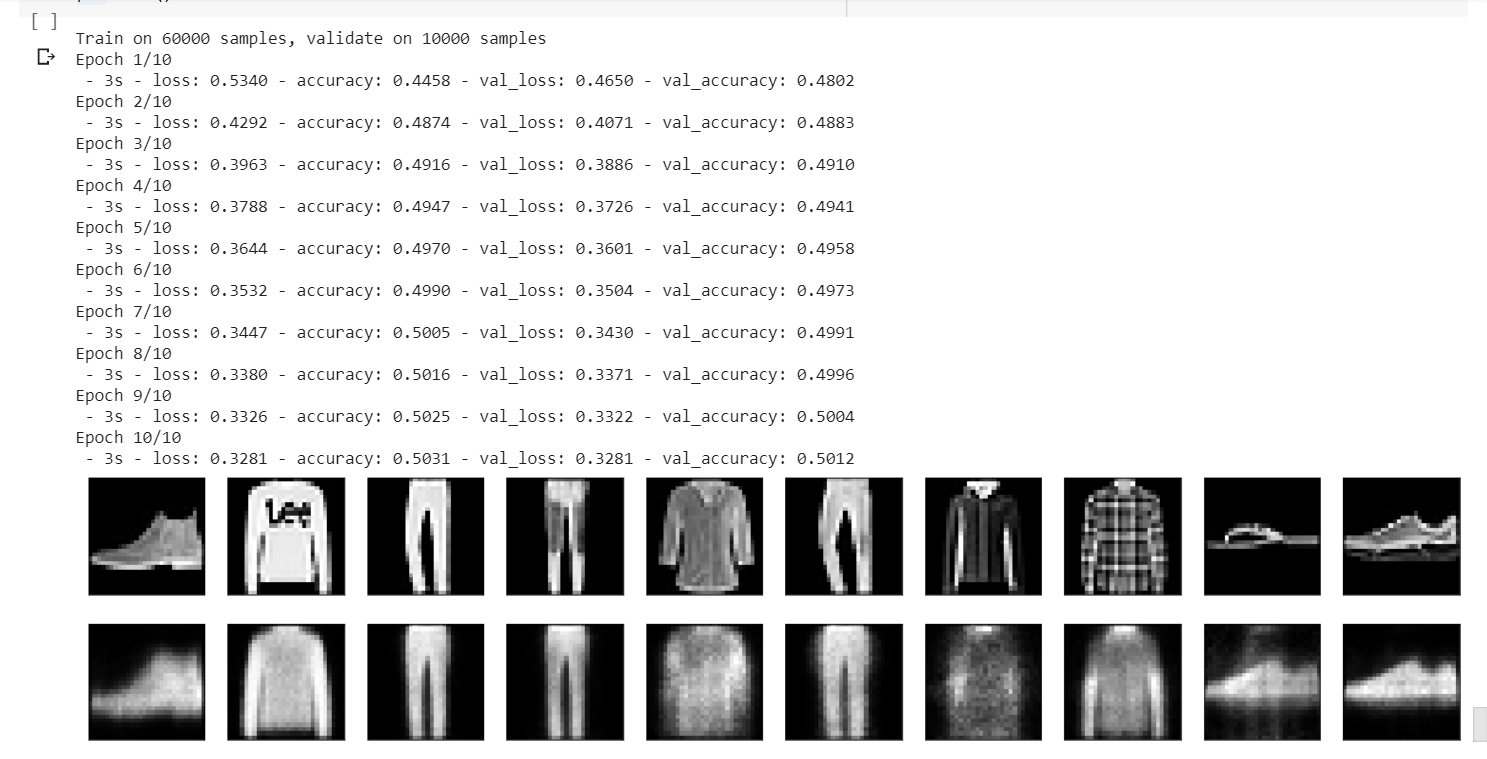
**Task 7:--**

Applying\_Encoding\_And\_Showing\_Encoding\_&\_Decoding\_on Particular\_Image with mnist dataset in keras.

**Code & Output :-**







***Conclusion****:*

We have understood and implemented the above-mentioned concepts. The loss and accuracy graphs are plotted in tensorboard. Linear Regression, Logistic Regression models are evaluated. Text Classification is implemented using CNN and LSTM models and the accuracies are compared. Image classification is implemented using CNN.