**IN CLASS PROGRAMMING ASSIGNMENT**

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Github link : https://github.com/SaiLeelaOtikundala/neural-network-icp3.git

**QUESTION 1**

Graphical user interface, text, application

Description automatically generated

I have imported numpy and all the required libraries here and set the seed to a random value and next, loaded the data. I have converted the data to float and scaled the values between 0 and 1. I have checked the shape and changed the values to categorical data.

Later, I added the layers and created a network with the layers given in the question.

Text

Description automatically generated with low confidence

I have now used the model SGD and compiled the model.

Graphical user interface, application

Description automatically generated

I have given the values for epochs and batch size and fit the model and then evaluated it.

Accuracy score is 65.5%

Text

Description automatically generated

I have done the same thing as above, but here I have given the learning rate.

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Description automatically generated

I have created the model and compiled it by giving a learning rate of 0.01. And then fitted the model and evaluated it.

A picture containing text

Description automatically generated

I got an accuracy of 57.35%

-Yes, the performance has changed as the accuracy has decreased in the second case.

**QUESTION 2**

Text

Description automatically generated

I predicted the first 4 images of the test data using predict method and then converted them to class labels and later converted the actual labels to class labels and compared both of them.

-It is not correctly predicted correctly as the values in the predicted labels are not the same as that of actual labels.

**QUESTION 3**

Text

Description automatically generated with medium confidence

I plotted 2 graphs here, for training and validation loss where X-axis is for Epoch and Y-axis is for Loss. The next is for training and validation accuracy where X-axis is for Epoch and Y-axis is for Accuracy using history object.

Graphical user interface, chart, line chart

Description automatically generated