

# MODEL REPORT

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## ->Model Architecture Overview

For the classification task of the VIS10CAT.txt data , a deep learning based convolutional neural network is used with 7 convolutional layers which in step downscales the Input Image Size (  $3 * 256 * 256$  ) by a factor of 2 per convolutional layer . Each Convolution Layer is followed by a batch-normalization layer which helps in regularization followed by ReLU activation.

The last convolution layer output's is flattened and fed to a dense layer which outputs the score for each of 10 classes. The Loss function used is Cross Entropy Loss.

## -> Dataset-

The images are downloaded from by extracting the links from text dataset file VIS10CAT. The corrupted files are removed by catching exceptions through try – catch blocks in python.

Finally around 800 images . Data Augmentation techniques, namely rotation and flipping, is performed to get more data points for the deep neural network.

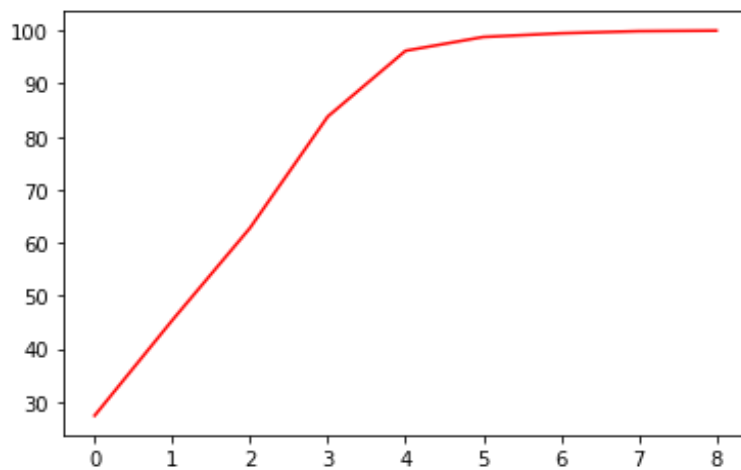
X train has 1000 images and X test has 150 images

```
count of BarGraph = 111
count of Map = 178
count of AreaGraph = 83
count of RadarPlot = 76
count of PieChart = 91
count of VennDiagram = 62
count of LineGraph = 96
count of ParetoChart = 91
count of Table = 113
count of ScatterGraph = 99
No. of training data 1000
```

->Accuracy –

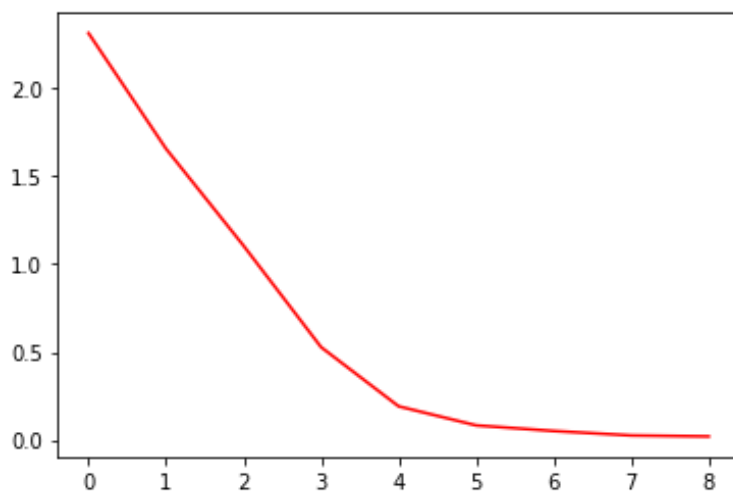
For the Training Set – 99%

Accuracy of training set plotted against no. of epochs



----- Epochs ----->

Loss Plot –



For the Test Set – Accuracy = 56% , 1500 images , Batch Size of – 10

```
Test batch 0 / 15 Correct = 2 Total = 10 , Loss = 2.750926971435547
Test batch 1 / 15 Correct = 4 Total = 10 , Loss = 1.0590659379959106
Test batch 2 / 15 Correct = 8 Total = 10 , Loss = 1.1116572618484497
Test batch 3 / 15 Correct = 3 Total = 10 , Loss = 2.4794301986694336
Test batch 4 / 15 Correct = 7 Total = 10 , Loss = 1.2313709259033203
Test batch 5 / 15 Correct = 5 Total = 10 , Loss = 2.2066407203674316
Test batch 6 / 15 Correct = 4 Total = 10 , Loss = 2.4615867137908936
Test batch 7 / 15 Correct = 4 Total = 10 , Loss = 2.503526210784912
Test batch 8 / 15 Correct = 5 Total = 10 , Loss = 1.705134630203247
Test batch 9 / 15 Correct = 9 Total = 10 , Loss = 0.6419198513031006
Test batch 10 / 15 Correct = 4 Total = 10 , Loss = 1.8037159442901611
Test batch 11 / 15 Correct = 7 Total = 10 , Loss = 1.3918657302856445
Test batch 12 / 15 Correct = 9 Total = 10 , Loss = 0.372300386428833
Test batch 13 / 15 Correct = 6 Total = 10 , Loss = 1.3517725467681885
Test batch 14 / 15 Correct = 7 Total = 10 , Loss = 1.4304149150848389
Avg Loss = 1.6334219296773276 Accuracy = 56.0
```

## ->Conclusions

Current Deep Learning Model has high accuracy on the training data compared to test data . Model has overfitted the training data as there are less number of training data points despite performing augmentation and regularization through batch normalization.

## ->Link to Code in Google Colab –

<https://colab.research.google.com/drive/1t-Evu6j7h8Z2VFnxOz-n-g5jurT9T7nt?usp=sharing>

## ->Github Link to test on Images –

[https://github.com/abhigyan13/Continual\\_Engine\\_Assignment](https://github.com/abhigyan13/Continual_Engine_Assignment)