Analysis Report

Assignment-1/Part-2B

Aim: Discussion of design of experiment for making CNN for cifar-10 dataset

Parameter taken into consideration for design of experiment:

- Batch Size
- Number of Epochs
- Validation Split
- Learning Rate
- Optimizer
- Loss Function
- Activation Function
- Dropout rate
- Number of neurons
- Number of hidden layers

Design of Experiment:

Two different models were made, one with single hidden layer and other with multiple hidden layer.

Following were the experiments carried out:

	Configuration 1 (Base Code)	Configuration 2	Configuration 3	Configuration 4
Batch Size	32	32	128	128
Number of Epochs	20	20	20	30
Validation Split	0.2	0.2	0.2	0.2
Learning Rate	0.0001	0.0001	0.001	0.001
Optimizer	RMSprop	RMSprop	SGD	Adam
Loss Function	Categorical crossentropy	Categorical crossentropy	Categorical crossentropy	Categorical crossentropy
Activation Function (hidden Layer)	relu	relu	relu	relu
Dropout	0.25	0.25	0.25	0.35
Number of Neurons	512	512	256	256
Number of hidden layers	3	1	3	3
Training Accuracy	57.61	65.83	51.22	83.37
Validation Accuracy	49.36	64.43	54.57	80.20
Testing Accuracy	56.48	63.59	55.02	79.35

Design of experiments were done based of three factors:

- The amount of resources
- The good practices that are used while making deep learning model (that's the reason we have kept the loss function constant for this particular case, the best practice activation function is used everytime)
- To test as many logical feasible parameters

Conclusion:

- Configuration 4 gave the best accuracy, it had more potential if the number of epochs could be increased.
- All the models had the potential of improvising on the accuracy just by increasing the number of epochs.
- No model was overfitting the data