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# Task 5.1: Multi-digit recognition on Double-MNIST Dataset using CNN

This report presents the results of an experiment involving the recognition and classification of two handwritten digits within a single image using a Convolutional Neural Network (CNN) model trained on the MultiMNIST dataset. The primary objective is to design and train a CNN model to predict both digits simultaneously, which is akin to multi-label classification.

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Implementation:

A CNN model was designed and trained for this task. The architecture consists of convolutional layers, pooling layers, fully connected layers, and output layers. We change the batchsize, dropout rate and kernel sizes to analyse the model performance for different set of hyperparameters.

Graphical Analysis:

Runtime
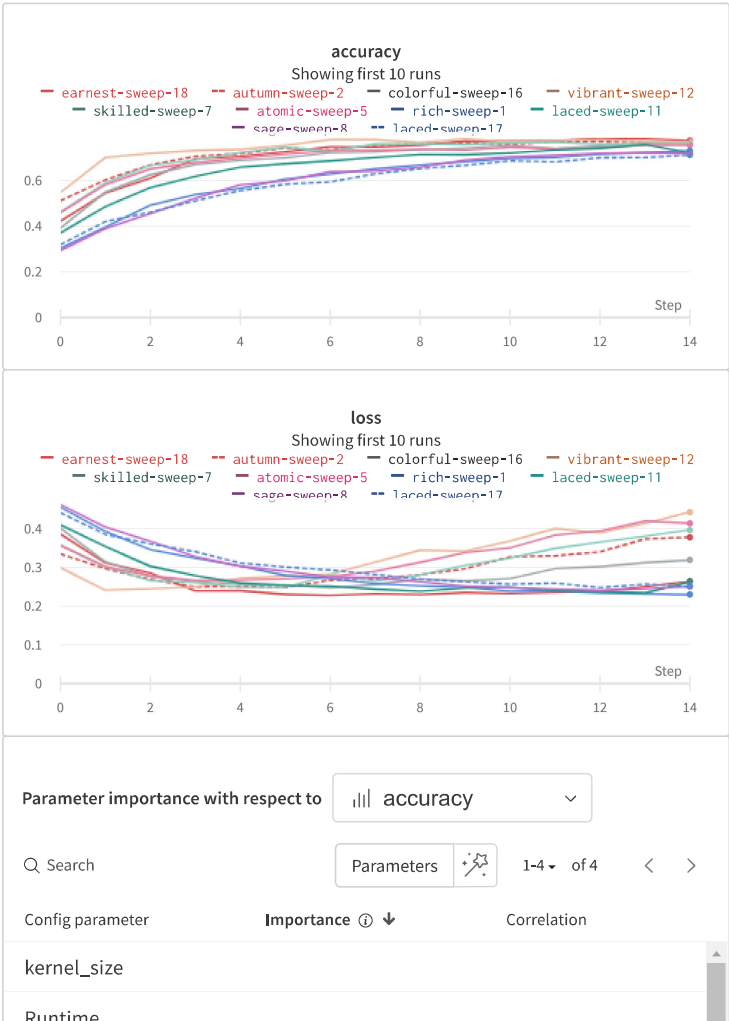
batch_size

dropout_rate

☑
Run set 20 ⋮

Analysis:

- Batch size: batch size of 32-128 works the best for the model
- Dropout Rate: moderate dropout rate of 0.25-0.5 prevent the overfitting in the model and give us good accuracy on validation data.
- kernel size: kernel size of 3-5 works the best for the model

The best set of hyperparameter for this model:

- dropout rate = 0.25
- kernel size = 5
- batch size = 128

This set of hyperparameter gives us an accuracy of 77.5% and loss of 0.26.

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https://wandb.ai/anushka-agrawal/5.1-CNN-classification/reports/Task-5-1-Multi-digit-recognition-on-Double-MNIST-Dataset-using-CNN--Vmlldzo1NzUxOTAz