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

In this report, we present the results of an experiment involving the recognition and classification of two handwritten digits within a single image using Multi-MNIST dataset. The goal is to build and train models that can simultaneously predict both digits in the image. This problem can be viewed as a multi-label classification task.

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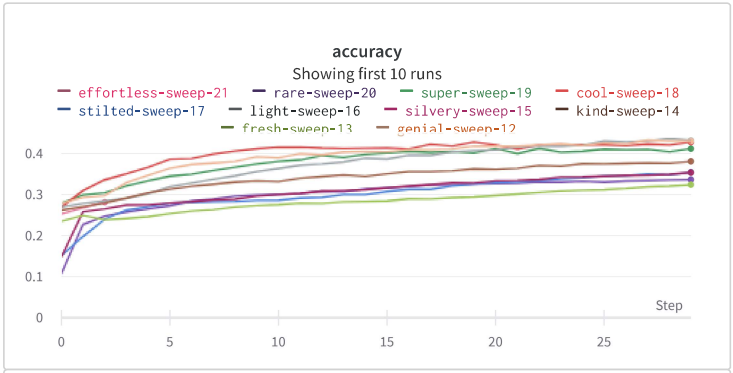
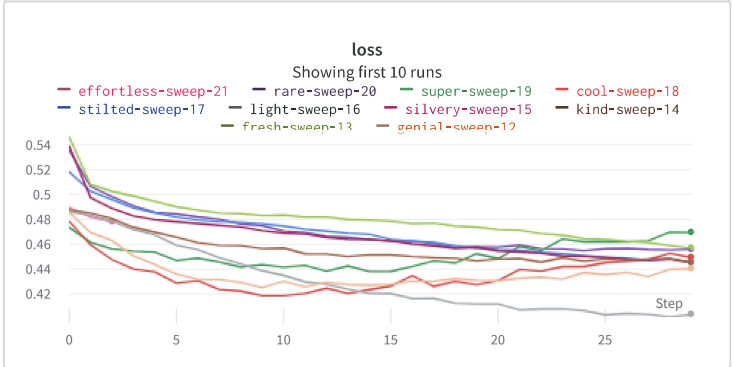
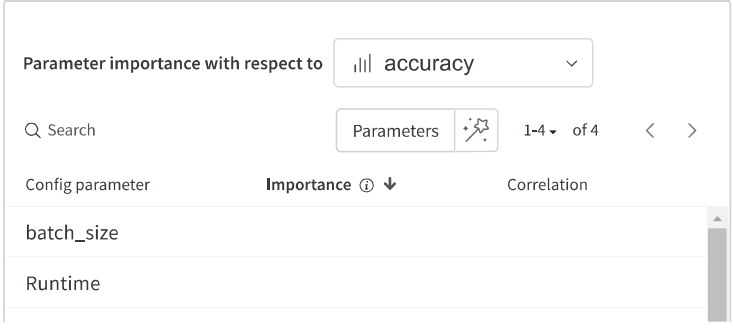
Implementation:

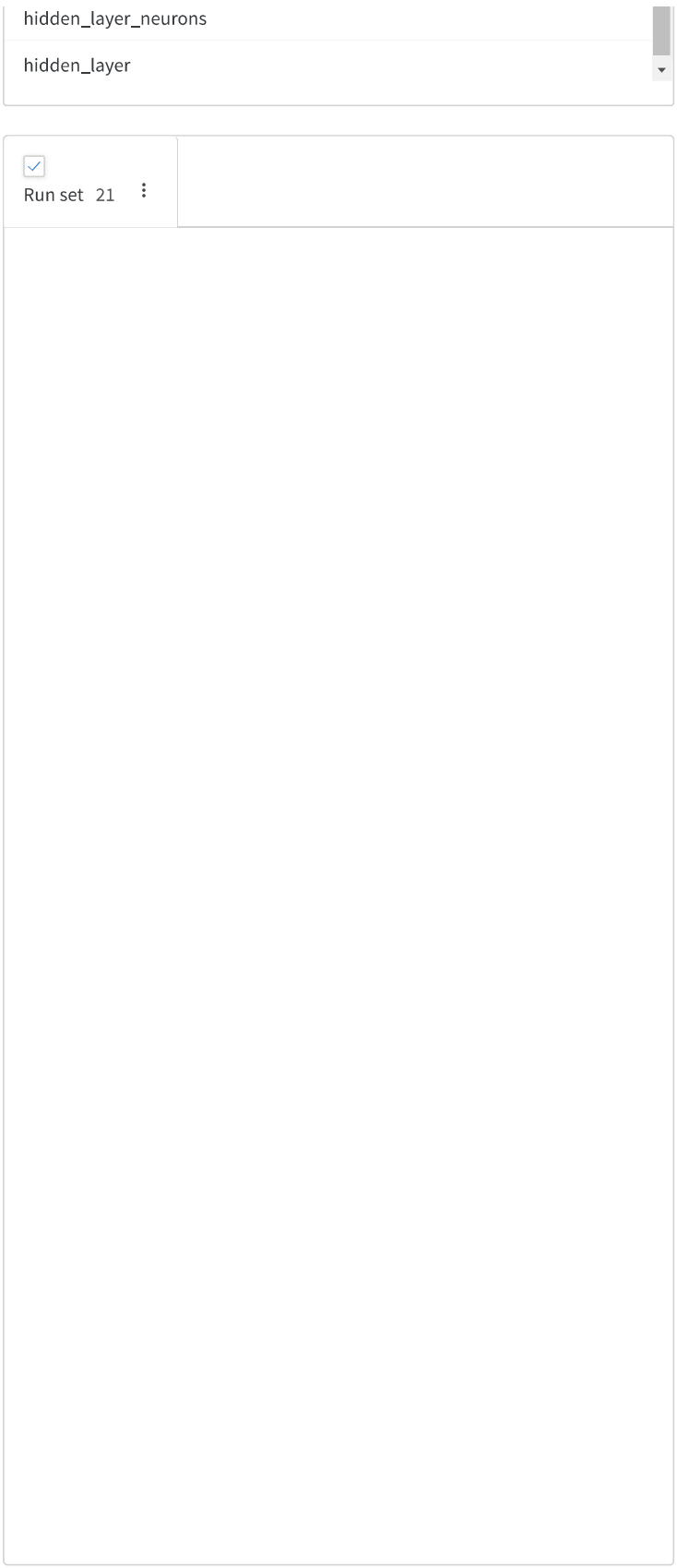
An MLP (Multi-Layer Perceptron) model for multi label classification (but atmost two classes) was implemented for this task. The architecture of the MLP consists of input layers for image data and multiple hidden layers. We run the model of 30 epochs with a learning rate of 0.001.

Graphical Analysis:









Analysis:

- hidden layers: the model works best for 1-2 no of hidden layers
- hidden layer neurons: a higher count of neurons about 70 helps in better recognition of the digits from the image dataset
- batch size: decent batch size of 32-128 works best for the model, it converges fast too

The best set of hyperparameters for this are:

- batch size: 128
- hidden_layer: 1
- hidden layer neurons: 70

The accuracy we get with this 48% on validation data and loss is 0.482

https://wandb.ai/anushka-agrawal/5.1-MLP-classification/reports/Task-5-1-Multi-digit-recognition-on-Double-MNIST-Dataset-using-MLP--Vmlldzo1NzUxNzk0