

Individual Contribution Report for Machine Learning [B9DA109] for Continuous Assessment 2

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In this continuous assessment, I have contributed to analysing the Fashion MNIST dataset, pre-processing it and creating a Convolutional Neural Network using TensorFlow and Keras from scratch. Respective studies were conducted to gain a better understanding of the CNN architecture and TensorFlow implementations. A Kaggle API link was created, and data was uploaded to Google Colab. The image dataset had to be processed and reshaped to particular dimensions to be able to fit into the Model. Hence, functions were created to perform these tasks. Furthermore, the image and label data were converted into TensorFlow datasets. To regularize the model, data augmentation pipelines were created to achieve randomness in the image data.

To gain a perspective on the image data, programs were written to plot the images clearly using Matplotlib and PyPlot. TensorFlow batch datasets were created from the training, validation and test datasets to feed them sequentially to the Model. To make sure of the fast and efficient flow of the training pipeline, data was cached and the subsequent batches prefetched while a current training iteration.

A fully connected Convolutional network was modelled containing four hidden layers. Respective filters of incrementally varying kernel size, Kernel initializers were added. The CNN model was fitted and classification report analysed. Furthermore, the test loss and accuracies were plotted and calculated.