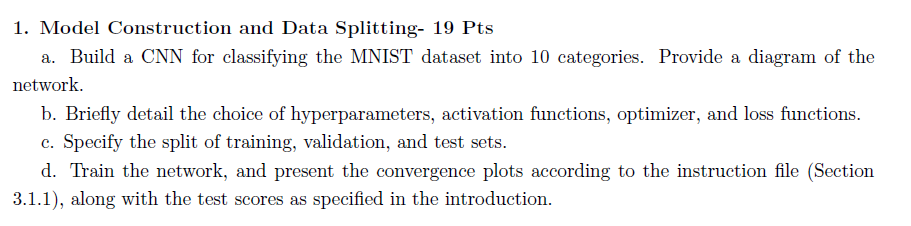
Home Work Assignment 1

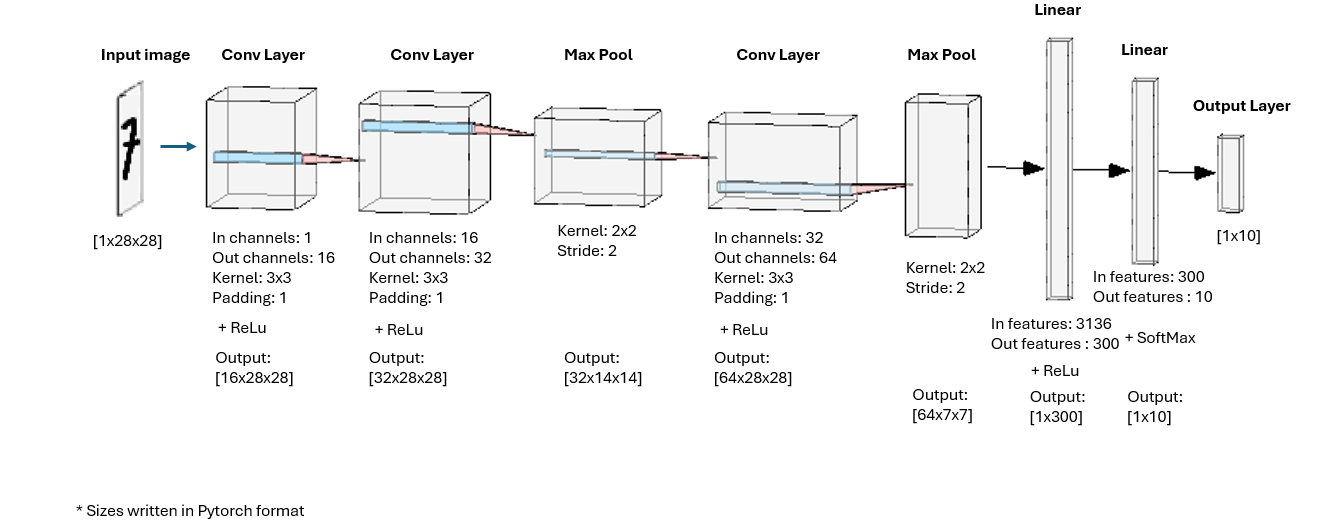
Along Zeltser -

Nadav Amir - 308339860

**Question 1**



**Answer**



* 1. We followed a basic CNN structure. ReLU was used as the activation function to introduce non-linearity and minimize vanishing gradients phenomena, while SoftMax was applied at the output layer for probabilistic multi-class predictions[[1]](#footnote-1). A mini-batch size of 264 provided a balance between computational efficiency and convergence stability. We chose a learning rate of 0.001 for steady training and ran for 20 epochs to ensure sufficient learning without overfitting. Adam Optimizer was selected for its adaptive learning capability. Cross-entropy loss was used, as it is suitable for multi-class classification problems.
  2. Training 48,000 images (68.5%), Validation 12,000 images (17.1%), Test 10,000 images (14.2%)
  3. See the next page:

A graph of a train

AI-generated content may be incorrect.

Figure 1 – Training vs. Validation Loss Progress Graph

A graph showing a number of numbers

AI-generated content may be incorrect.

Figure 2 – Test Set Confusion Matrix

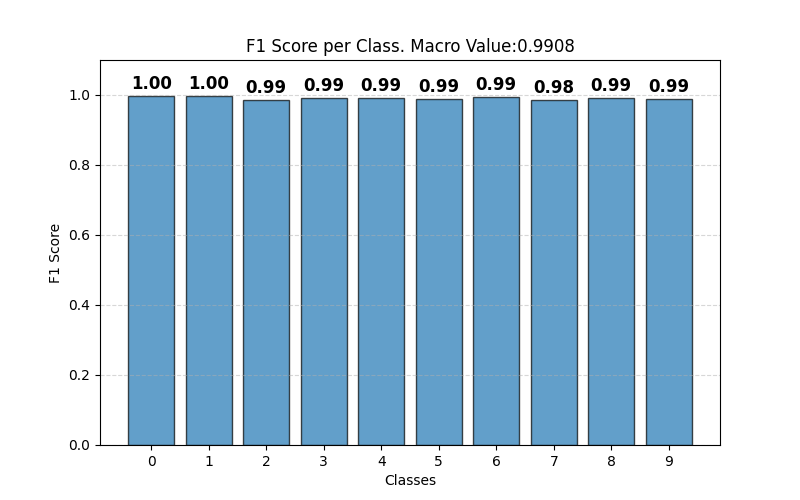


Figure 3 – Test Set F1 Score for each category + Macro (Average) Value

1. Although softmax is implied for multi-class classification, we did not apply it explicitly, as PyTorch’s CrossEntropyLoss includes it internally. [↑](#footnote-ref-1)