Week 5 Assignment - MSc AIDA UoM

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This assignment involves working with the MNIST and Fashion-MNIST datasets through examples provided on Google Colab. The datasets consist of black-and-white images of 28x28 pixels, accessible via the following Google Colab links:

- `MNIST`
- `Fashion-MNIST`

Tasks:

1. Make a copy of each Notebook in your Google Drive in order to be able to edit them
2. Data should be converted from integers in the range [0, 255] to decimals in the range [0,1] (normalization). Although this is helpful, it would be even more beneficial to standardize them to have a mean of 0 and a standard deviation of 1 (standardization). Process the data to achieve this. Use only the training data to calculate the transformation coefficients, but apply them to the test set as well.
3. Compare the results of the training (train/validation/test loss and accuracy) with the previous results.
4. In addition to SGD, try training the networks with SGD+momentum and Adam. Present the results along with a brief commentary on why you believe the behavior varies.
5. Try changing the architecture of the network (make it wider or deeper). Plot the new networks, train them, and comment on their behavior.

The questions should be answered within the Colab notebook. Use the provided `template` above to create your answers.