WS5 – Task 1
(MNIST classification using Batch GD (BGD) driven softmax regression)

- **Download mnist folder from Canvas**
- **The provided code will extract and pre-process the dataset**
- **The provided code also does the post-processing including thresholding, accuracy etc.**
- **For your ease, following lines are left empty for you to fill.**

err =
gradients =
theta =
y_predict =

Note that batch gradient descent computes the gradient using the whole dataset

1.1. Use BGD and complete the model
1.2. Explain in detail (step by step) the whole process in your own words, including:
- **raw data**
- **pre-processing (both X and Y (onehot encoded))**
- **Number of iterations/epochs**
- **Calculation of above 4 lines**

1.3. Test the model on test data and comment on the results in detail

WS5 – Task 2
(MNIST classification using Stochastic GD (SGD) driven softmax regression)

- **Download mnist.pkl.gz from Canvas**
- **The provided code will extract and pre-process the dataset**
- **The provided code also does the post-processing including thresholding, accuracy etc.**
- **For your ease, following lines are left empty for you to fill.**

err =
gradients =
Updated theta =
y_predict =

Note that stochastic gradient descent computes the gradient using small batches

2.1. Use SGD and complete the model

2.2. Explain in detail (step by step) the whole process in your own words, including:

- **raw data**
- **Number of iterations/epochs**
- **pre-processing (mini-batches)**
- **Calculation of above 4 lines**
- **difference between task 1 and 2, in terms of accuracy**

2.3. Test the model on test data and comment on the results in detail