Assignment #4

For all your work, submit a Notebook (either Jupyter or Colab.)
Using **TensorFlow tf.data and TFDS** functionality, provide code snippets for the following Deep Learning tasks:

1. Create Custom Dataset using tf.data API:
Given the following pair:
X_train = [[1,2,3], [4,5,6], [7,8,9], [10,11,12]] # sample data
y_train = [0,1,0,1] # sample labels

Create a tf.data.Dataset from the above pair.
Shuffle and batch the dataset
https://www.tensorflow.org/api_docs/python/tf/data/Dataset#shuffle

2. Loading data using TFDS:
Load the '**mnist**' dataset.
Provide information (info) about this TFDS dataset.
What is the size of each 'split' for this TFDS dataset.
What is the size of 'labels' for this TFDS dataset.
Print the 'labels' for this TFDS dataset.

Load the '**imdb_reveiws**' dataset.
Provide information (info) about this TFDS dataset.
What is the size of each 'split' for this TFDS dataset.
What is the size of 'labels' for this TFDS dataset.
Print the 'labels' for this TFDS dataset.

3. Custom preprocessing and augmentation:
Use the 'mnist' dataset from step 2, above.
Define custom preprocessing and augmentation functions as follows:
Random flip left-right all images, read more here:
https://www.tensorflow.org/api_docs/python/tf/image/random_flip_left_right
Apply custom preprocessing to dataset (after defining 'function' from above)
Shuffle, batch, and prefetch the dataset
https://www.tensorflow.org/api_docs/python/tf/data/Dataset
Iterate over the augmented dataset, list the first 5 batches.
https://www.tensorflow.org/api_docs/python/tf/data/Dataset#take