Experiment List

1. Build a Neural Network Model with specified parameters.

2. Use the following polynomial equation to train the specified neural network with random train and test dataset.

$$3x^3 + 7x^2 - 12x + 2$$

3. Design a Customize DNN for Handwritten Digit Classification and train the model with MNIST Dataset.

4. Apply Data Augmentation in MNIST Dataset compare the results of augmented dataset with the original dataset for the DNN Model.

5. Design a Customize CNN for Handwritten Digit Classification with the following specifications:
   a. Generate a CNN model with:
      i.   Two CNN hidden layers (Conv2D) of sizes 32, 64 followed by
      ii. ReLU Activation and
      iii. MaxPooling2D with Kernel size (3, 3), and
      iv. Stride= (1,1)
   b. Use Flatten Layers to convert the feature map into 1D
   c. Use simple Dense layer of size 64 followed by output Dense Layer of size 10 with SoftMax Activation Function
   d. Use the MNIST database for training and testing
   e. Carefully read the problem specifications and implement the CNN accordingly.

6. Apply Data Augmentation in MNIST Dataset compare the results of augmented dataset with the original dataset for the CNN Model.

7. Design a Customize CNN classifier model for MNIST Fashion Dataset.

8. Design a Customize TL for Handwritten Digit Classification using ResNet50 with the following specifications:

    a. Generate a TL model with:

        i.   Freeze FC and output layers of ResNet50.

        ii.   Set a new FC and output layer for MNIST classification.

        iii. Initialize weight with 'ImageNet'.

    b. In new FC, use Dense layer of size 512 followed by output Dense Layer of size 10 with SoftMax Activation Function

    c. Use the MNIST database for training and testing.

    d. Use Data Augmentation for training and test sets of MNIST before training.

    e. Carefully read the problem specifications and implement the TL accordingly.

9. Design a Customize TL for Handwritten Digit Classification using VGG16 with the following specifications:

    a. Generate a TL model with:

        i.   Freeze FC and output layers of VGG16.

        ii.   Set a new FC and output layer for MNIST classification.

        iii. Initialize weight with 'ImageNet'.

    b. In new FC, use Dense layer of size 512 followed by output Dense Layer of size 10 with SoftMax Activation Function

    c. Use the MNIST database for training and testing.

    d. Use Data Augmentation for training and test sets of MNIST before training.

    e. Carefully read the problem specifications and implement the TL accordingly.