LP-IV Sample Problem Statement

1. Implementing Feedforward neural networks with Keras and TensorFlow for classification of hand-written MNIST dataset using below steps:
   a. Import the necessary packages
   b. Load the training and testing data
   c. Define the network architecture using Keras
   d. Train the model using SGD with 11 epochs
   e. Evaluate the network
   f. Plot the training loss and accuracy

2. Implement the Image classification CNN model for classifying hand-written MNIST dataset by dividing the model into following 4 stages:
   a. Loading and preprocessing the image data
   b. Defining the model's architecture
   c. Training the model
   d. Estimating the model's performance

3. Build Feedforward neural networks with Keras and TensorFlow for classification of CIFAR10 image dataset using the following steps:
   a. Import the necessary packages
   b. Load the training and testing data
   c. Define the network architecture using Keras
   d. Train the model using SGD/Adam optimizer
   e. Evaluate the network
   f. Plot the training loss and accuracy

4. Implement the CNN model for classifying CIFAR10 image dataset by dividing the model into following 4 stages:
   a. Loading and preprocessing the image data
   b. Defining the model's architecture
   c. Training the model
   d. Estimating the model's performance

5   Implement anomaly detection for given credit card dataset using Autoencoder and build the model by using the following steps:
       a. Import required libraries
       b. Upload / access the dataset
       c. Encoder converts it into latent representation
       d. Decoder networks convert it back to the original input
       e. Compile the models with Optimizer, Loss, and Evaluation Metrics

6   Implement the Continuous Bag of Words (CBOW) Model for the given (textual document 1) using the below steps:
a. Data preparation
b. Generate training data
c. Train model
d. Output

7   Implement the Continuous Bag of Words (CBOW) Model for the given (textual document 2) using the below steps:
a. Data preparation
b. Generate training data
c. Train model
d. Output

8   Implement the Continuous Bag of Words (CBOW) Model for the given (textual document 3) using the below steps:
a. Data preparation
b. Generate training data
c. Train model
d. Output

9   Object detection using Transfer Learning of CNN architectures for the given (image dataset 1) using the below steps:
a. Load in a pre-trained CNN model trained on a large dataset
b. Freeze parameters (weights) in model's lower convolutional layers
c. Add custom classifier with several layers of trainable parameters to model
d. Train classifier layers on training data available for task
e. Fine-tune hyper parameters and unfreeze more layers as needed

10   Object detection using Transfer Learning of CNN architectures for the given (image dataset 2) using the below steps:
a. Load in a pre-trained CNN model trained on a large dataset
b. Freeze parameters (weights) in model's lower convolutional layers
c. Add custom classifier with several layers of trainable parameters to model
d. Train classifier layers on training data available for task
e. Fine-tune hyper parameters and unfreeze more layers as needed

11   Object detection using Transfer Learning of CNN architectures for the given (image dataset 3) using the below steps:
a. Load in a pre-trained CNN model trained on a large dataset
b. Freeze parameters (weights) in model's lower convolutional layers
c. Add custom classifier with several layers of trainable parameters to model
d. Train classifier layers on training data available for task
e. Fine-tune hyper parameters and unfreeze more layers as needed

12   Implementing Feedforward neural networks with Keras and TensorFlow
a. Import the necessary packages
b. Load the training and testing data (MNIST/CIFAR10)

c. Define the network architecture using Keras
d. Train the model using SGD
e. Evaluate the network
f. Plot the training loss and accuracy

13 Build the Image classification model by dividing the model into following 4 stages:
a. Loading and preprocessing the image data
b. Defining the model's architecture
c. Training the model
d. Estimating the model's performance

14 Use Autoencoder to implement anomaly detection. Build the model by using:
a. Import required libraries
b. Upload / access the dataset
c. Encoder converts it into latent representation
d. Decoder networks convert it back to the original input
e. Compile the models with Optimizer, Loss, and Evaluation Metrics

15 Implement the Continuous Bag of Words (CBOW) Model. Stages can be:
a. Data preparation
b. Generate training data
c. Train model
d. Output

16 Object detection using Transfer Learning of CNN architectures
a. Load in a pre-trained CNN model trained on a large dataset
b. Freeze parameters (weights) in model's lower convolutional layers
c. Add custom classifier with several layers of trainable parameters to model
d. Train classifier layers on training data available for task
e. Fine-tune hyper parameters and unfreeze more layers as needed