**Data Mining Lab # 10:**

**Exercise # 02:**

**Previous Code Details:**

***1. Loading and Displaying Data:*** The given code loads the Fashion MNIST dataset. It displays the shape of its components and visualizes a grid of images.

***2. Normalize Data:*** Pixel values of images are scaled from 0 to 255 to a range of 0 to 1 to improve neural network training efficiency.

***3. Train Model*:** A neural network (MLPClassifier) with one hidden layer of 4 neurons is trained on the reshaped and normalized image data.

***4. Evaluate Model:*** It predicts labels for the test dataset and computes the accuracy using a confusion matrix.

***5. Report Results:*** The accuracy of the model is printed and a classification report for each fashion category is generated, detailing performance metrics.

**Edited Code Details:**

***1. Model Complexity:*** The MLP classifier now has three hidden layers with 256, 128 and 64 neurons, enhancing its ability to capture intricate data patterns.

***2. Increased Training:*** The `max\_iter` parameter is set to 300, allowing the model more iterations for better convergence during training.

***3. Learning Rate:*** Although set to the default value of 0.0005, specifying the learning rate makes it easier for future adjustments to improve training dynamics.

***4. Data Reshaping:*** The image data is flattened into one-dimensional arrays to be compatible with the MLP classifier's input requirements.

***5. Evaluation:*** After training, the model's predictions are evaluated using a confusion matrix and a classification report to assess its performance on the test data.