Assignment 1

Dataset Information:

* Dataset Title: [MNIST Handwritten Digits Dataset](https://www.kaggle.com/datasets/avnishnish/mnist-original)
* Description: The MNIST dataset is a collection of 28x28 pixel grayscale images of handwritten digits (0 through 9). It is widely used in the field of machine learning for image classification tasks.

**Task 1: NumPy and Pandas**

* Data Loading and Exploration:
  + Load the MNIST dataset using a suitable Python library (e.g. PyTorch).
  + Explore the first 10 images and their corresponding labels.
* Data Preprocessing:
  + Flatten the 28x28 images into 1D arrays.
  + Normalize the pixel values to a range between 0 and 1.
* Descriptive Statistics:
  + Calculate and display the distribution of labels (digits 0 through 9).
  + Visualize a few examples from each digit class.

**Task 2: Matplotlib**

* Data Visualization:
  + Display a random sample of 10 images along with their true labels.
  + Create a bar chart illustrating the distribution of digit classes in the dataset.
* Image Preprocessing:
  + Apply image augmentation techniques (e.g., rotation, scaling) to augment the dataset.
  + Visualize a few augmented images for a specific digit.

Submission Guidelines:

* Create a Jupyter/Colab notebook containing your Python code and explanations.
* Include comments in your code for clarity.
* Provide visualizations with proper titles and labels.
* Submit your assignment along with any necessary files.