

# MNIST Classification using Fully Connected Neural Network (FNN)

## Objective

To classify handwritten digits (0–9) from the MNIST dataset using a basic neural network (FNN) built with TensorFlow/Keras.

## Dataset

- **MNIST Dataset:**
  - 60,000 training images, 10,000 testing images
  - Grayscale digits (0–9), 28x28 pixels each

## Methodology

- **Preprocessing:**
  - Normalize pixel values to the  $[0, 1]$  range
  - Flatten 28x28 images into 784-dimensional vectors
  - One-hot encode target labels
- **Model Architecture:**
  - Input Layer: 784 nodes (flattened 28x28 image)
  - Dense Layer: 128 units, ReLU activation
  - Output Layer: 10 units, Softmax activation
- **Training Configuration:**
  - Optimizer: Adam
  - Loss Function: Categorical Crossentropy
  - Epochs: 10
  - Batch Size: 32