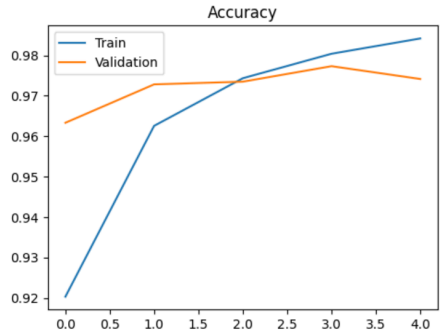
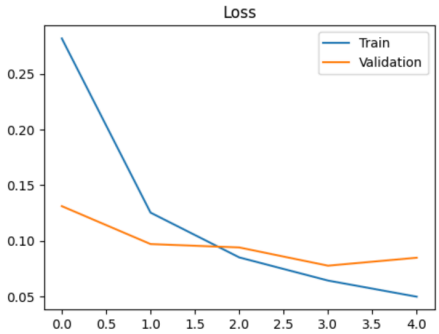
EXPERIMENT 1

```
           7       0.97      0.97      0.97      1028
           8       0.92      0.99      0.95       974
           9       0.97      0.97      0.97      1009

    accuracy                           0.97     10000
   macro avg       0.97      0.97      0.97     10000
weighted avg       0.97      0.97      0.97     10000

Confusion Matrix:
[[ 965    0    0    2    1    2    2    1    4    3]
 [   0 1101    0    8    0    0    1    1   24    0]
 [   5    0  988    9    1    1    0    8   20    0]
 [   0    0    0  998    0    1    0    3    4    4]
 [   0    0    4    0  957    0    3    3    3   12]
 [   3    0    0   16    1  860    2    2    5    3]
 [   5    3    0    2    3    6  934    0    5    0]
 [   1    1    8    5    2    0    0  996    5   10]
 [   1    0    1    5    3    1    1    2  960    0]
 [   2    2    0    4    8    2    0    6    8  977]]
```





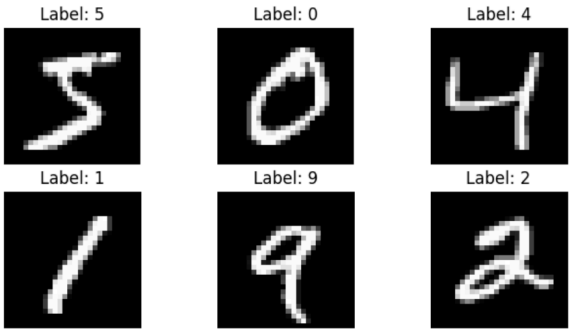

```
Epoch 1/5
1688/1688 ━━━━━━━━━━━━━━━━━━━━ 9s 4ms/step - accuracy: 0.8716 - loss: 0.4609 - val_accuracy: 0.9633 - val_loss: 0.1312
Epoch 2/5
1688/1688 ━━━━━━━━━━━━━━━━━━━━ 7s 4ms/step - accuracy: 0.9607 - loss: 0.1347 - val_accuracy: 0.9728 - val_loss: 0.0972
Epoch 3/5
1688/1688 ━━━━━━━━━━━━━━━━━━━━ 6s 3ms/step - accuracy: 0.9753 - loss: 0.0838 - val_accuracy: 0.9735 - val_loss: 0.0941
Epoch 4/5
1688/1688 ━━━━━━━━━━━━━━━━━━━━ 7s 4ms/step - accuracy: 0.9807 - loss: 0.0629 - val_accuracy: 0.9773 - val_loss: 0.0778
Epoch 5/5
1688/1688 ━━━━━━━━━━━━━━━━━━━━ 6s 3ms/step - accuracy: 0.9854 - loss: 0.0464 - val_accuracy: 0.9742 - val_loss: 0.0849
313/313 ━━━━━━━━━━━━━━━━━━━━ 1s 2ms/step
Classification Report:
              precision    recall  f1-score   support

           0       0.98      0.98      0.98       980
           1       0.99      0.97      0.98      1135
           2       0.99      0.96      0.97      1032
           3       0.95      0.99      0.97      1010
           4       0.98      0.97      0.98       982
           5       0.99      0.96      0.97       892
           6       0.99      0.97      0.98       958
           7       0.97      0.97      0.97      1028
           8       0.92      0.99      0.95       974
           9       0.97      0.97      0.97      1009

    accuracy                           0.97     10000
   macro avg       0.97      0.97      0.97     10000
weighted avg       0.97      0.97      0.97     10000

Confusion Matrix:
[[ 965    0    0    2    1    2    2    1    4    3]
 [   0 1101    0    8    0    0    1    1   24    0]
 [   5    0  988    9    1    1    0    8   20    0]
 [   0    0    0  998    0    1    0    3    4    4]
 [   0    0    4    0  957    0    3    3    3   12]
 [   3    0    0   16    1  860    2    2    5    3]
 [   5    3    0    2    3    6  934    0    5    0]
 [   1    1    8    5    2    0    0  996    5   10]
 [   1    0    1    5    3    1    1    2  960    0]
 [   2    2    0    4    8    2    0    6    8  977]]
```

```
Downloading data from https://storage.googleapis.com/tensorflow/tf-keras-datasets/mnist.npz
11490434/11490434 ━━━━━━━━━━━━━━━━━━━━ 0s 0us/step
Training data shape: (60000, 28, 28)
Testing data shape: (10000, 28, 28)
```




```
/usr/local/lib/python3.12/dist-packages/keras/src/layers/reshaping/flatten.py:37: UserWarning: Do not pass an `input_shape`/`input_dim` argument to a layer. When us
  super().__init__(**kwargs)
Model: "sequential"
```

Layer (type)	Output Shape	Param #
flatten (Flatten)	(None, 784)	0
dense (Dense)	(None, 128)	100,480
dense_1 (Dense)	(None, 10)	1,290

```
 Total params: 101,770 (397.54 KB)
 Trainable params: 101,770 (397.54 KB)
 Non-trainable params: 0 (0.00 B)
Epoch 1/5
1688/1688 ━━━━━━━━━━━━━━━━━━━━ 9s 4ms/step - accuracy: 0.8716 - loss: 0.4609 - val_accuracy: 0.9633 - val_loss: 0.1312
```