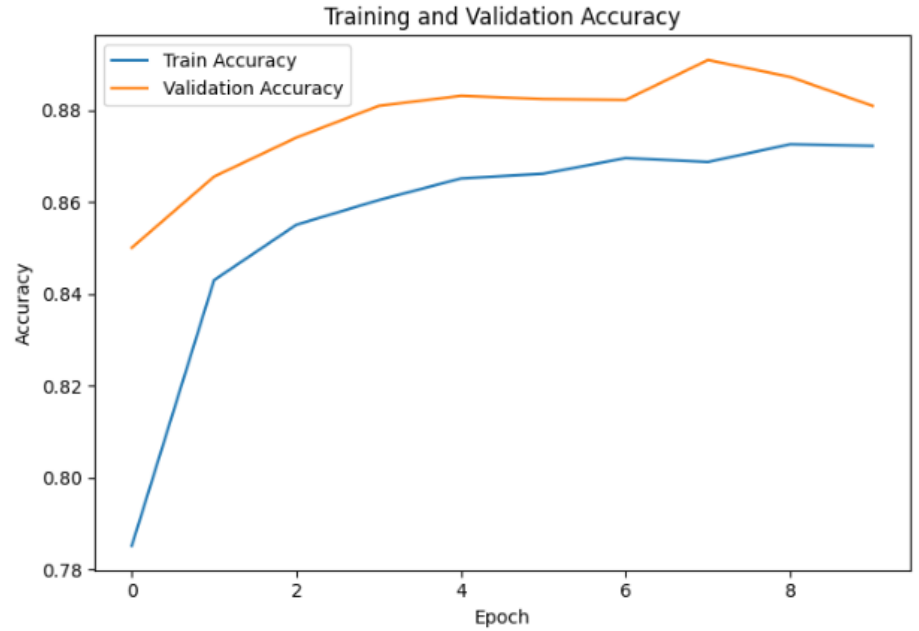
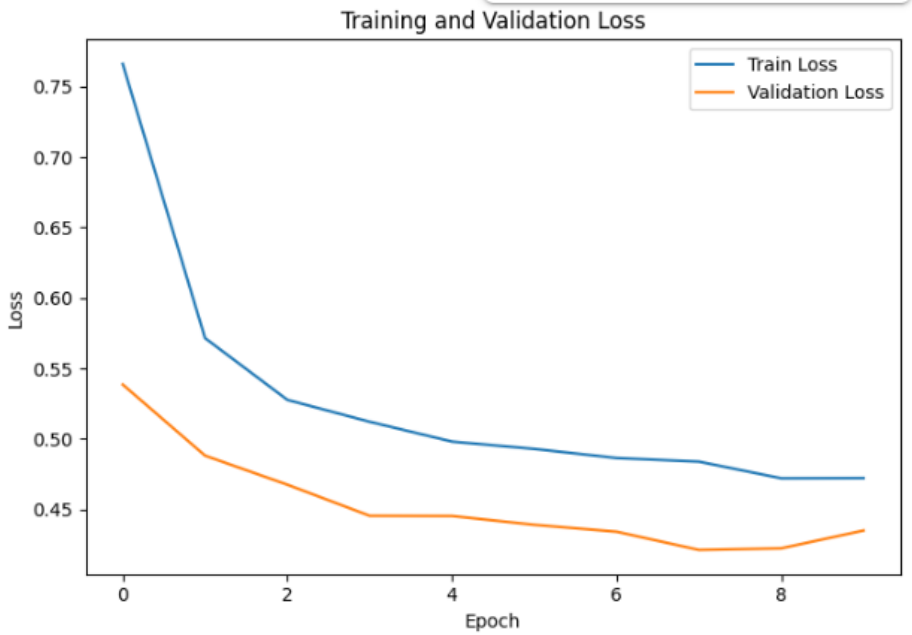
```
WARNING:absl:Variant folder /root/tensorflow_datasets/fashion_mnist/3.0.1 has no dataset_info.json
Downloading and preparing dataset Unknown size (download: Unknown size, generated: Unknown size, total: Unknown size) to /root/tensorflow_datasets/fashion_mnist
Dl Completed...: 100% ▉ 4/4 [00:02<00:00,  2.65 url/s]
Dl Size...: 100% ▉ 29/29 [00:02<00:00,  4.96 MiB/s]
Extraction completed...: 100% ▉ 4/4 [00:02<00:00,  2.36 file/s]
Dataset fashion_mnist downloaded and prepared to /root/tensorflow_datasets/fashion_mnist/3.0.1. Subsequent calls will reuse this data.
Epoch 1/10
/usr/local/lib/python3.11/dist-packages/keras/src/layers/convolutional/base_conv.py:107: UserWarning: Do not pass an `input_shape`/`input_dim` argument to a lay
  super().__init__(activity_regularizer=activity_regularizer, **kwargs)
469/469 ━━━━━━━━━━━━━━━━━━━━ 45s 81ms/step - accuracy: 0.7132 - loss: 0.9956 - val_accuracy: 0.8501 - val_loss: 0.5385
Epoch 2/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 74s 76ms/step - accuracy: 0.8388 - loss: 0.5845 - val_accuracy: 0.8656 - val_loss: 0.4881
Epoch 3/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 40s 74ms/step - accuracy: 0.8573 - loss: 0.5235 - val_accuracy: 0.8741 - val_loss: 0.4675
Epoch 4/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 36s 76ms/step - accuracy: 0.8626 - loss: 0.5103 - val_accuracy: 0.8810 - val_loss: 0.4454
Epoch 5/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 36s 76ms/step - accuracy: 0.8674 - loss: 0.4948 - val_accuracy: 0.8832 - val_loss: 0.4453
Epoch 6/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 41s 76ms/step - accuracy: 0.8667 - loss: 0.4940 - val_accuracy: 0.8825 - val_loss: 0.4390
Epoch 7/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 36s 76ms/step - accuracy: 0.8725 - loss: 0.4780 - val_accuracy: 0.8823 - val_loss: 0.4341
Epoch 8/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 34s 73ms/step - accuracy: 0.8679 - loss: 0.4847 - val_accuracy: 0.8910 - val_loss: 0.4212
Epoch 9/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 43s 77ms/step - accuracy: 0.8750 - loss: 0.4671 - val_accuracy: 0.8873 - val_loss: 0.4223
Epoch 10/10
469/469 ━━━━━━━━━━━━━━━━━━━━ 41s 77ms/step - accuracy: 0.8708 - loss: 0.4711 - val_accuracy: 0.8810 - val_loss: 0.4350
```

469/469 ━━━━━━━━━━━━━━━━━━━━ 41s 77ms/step - accuracy: 0.8708 - loss: 0.4711 - val_accuracy: 0.8810 - val_loss: 0.4350

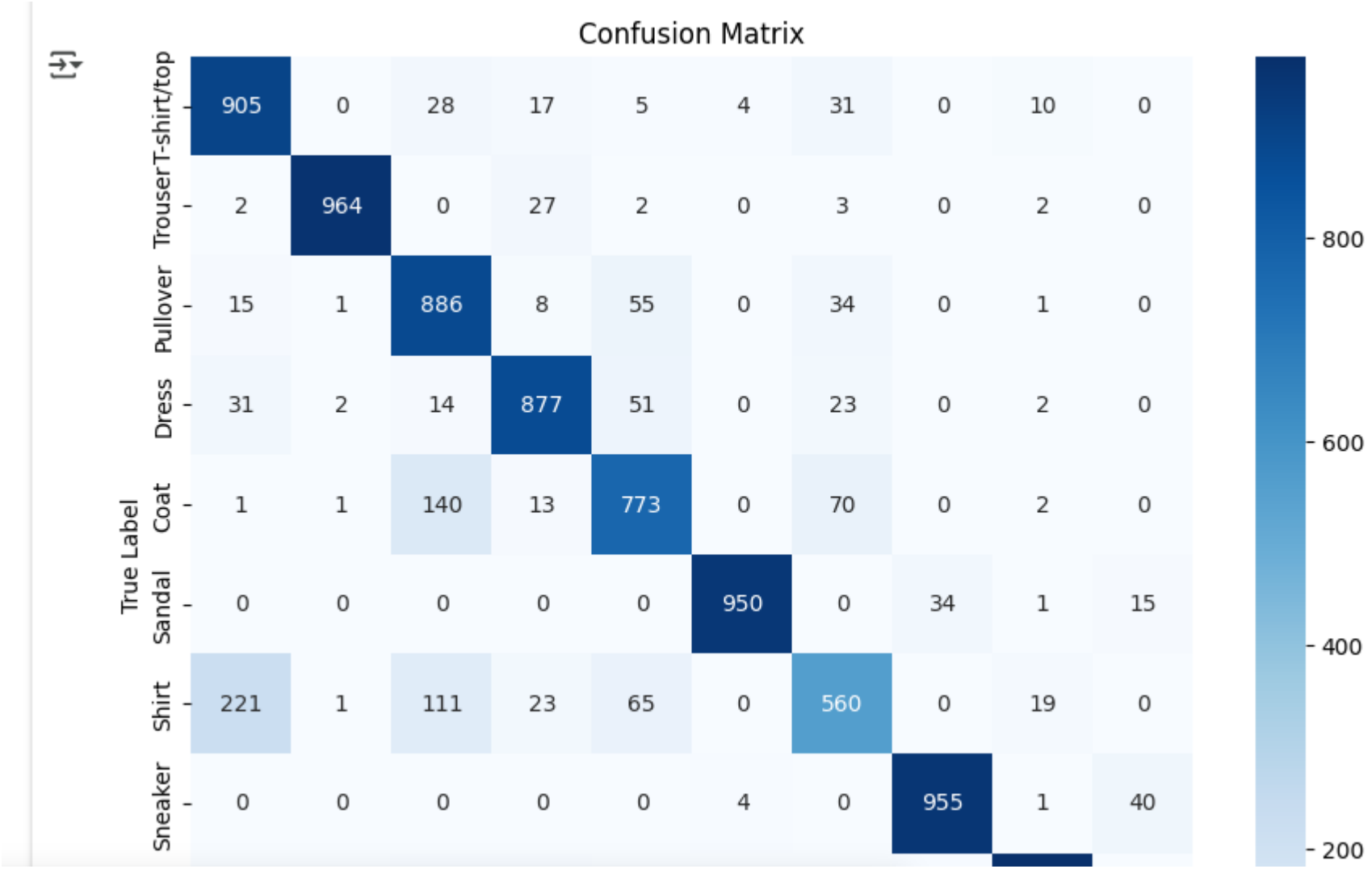




313/313 ━━━━━━━━━━━━━━━━━━━━ 2s 6ms/step
Classification Report:

```
313/313 ━━━━━━━━━━━━━━━━━━━━ 2s 6ms/step
Classification Report:
```

	precision	recall	f1-score	support
T-shirt/top	0.77	0.91	0.83	1000
Trouser	0.99	0.96	0.98	1000
Pullover	0.75	0.89	0.81	1000
Dress	0.91	0.88	0.89	1000
Coat	0.81	0.77	0.79	1000
Sandal	0.98	0.95	0.97	1000
Shirt	0.78	0.56	0.65	1000
Sneaker	0.93	0.95	0.94	1000
Bag	0.96	0.98	0.97	1000
Ankle boot	0.94	0.96	0.95	1000
accuracy			0.88	10000
macro avg	0.88	0.88	0.88	10000
weighted avg	0.88	0.88	0.88	10000


Confusion Matrix
True Label
T-shirt/top
Trouser
Pullover
Dress
Coat
Sandal
Shirt
Sneaker
905 0 28 17 5 4 31 0 10 0
2 964 0 27 2 0 3 0 2 0
15 1 886 8 55 0 34 0 1 0
31 2 14 877 51 0 23 0 2 0
1 1 140 13 773 0 70 0 2 0
0 0 0 0 0 950 0 34 1 15
221 1 111 23 65 0 560 0 19 0
0 0 0 0 0 4 0 955 1 40
800
600
400
200

```
Named Entities in the text:
Apple - ORG
U.K. - GPE
$1 billion - MONEY
Elon Musk - PERSON
2002 - DATE
Tesla - ORG
2003 - DATE
'\nEthical Reflection:\n\n- Bias & Fairness: Fashion MNIST is a balanced dataset, but real-world datasets may have biases that m
d.\n- Privacy: No personal or sensitive data is used here. For real applications, ensure data privacy and consent.\n- Transparen
rameters, and training details are documented for reproducibility.\n- Optimization: Regularization (dropout, L2) was applied to
perparameter tuning can improve performance.\n- Responsible Use: AI outputs, especially in sensitive domains, should be validate
```