Total Classes Detected: 43

Importing Classes...

/usr/lib/python3.10/multiprocessing/popen\_fork.py:66: RuntimeWarning: os.fork() was called. os.fork() is incompatible with multithreaded code, and JAX is multithreaded, so this will likely lead to a deadlock.

self.pid = os.fork()

Loaded Class 0 Images: 0210 Took 02.0334 seconds 0.9683ms/image 103.3 images/s

Loaded Class 1 Images: 2220 Took 23.6029 seconds 1.0632ms/image 94.1 images/s

Loaded Class 2 Images: 2250 Took 22.5805 seconds 1.0036ms/image 99.6 images/s

Loaded Class 3 Images: 1410 Took 13.6453 seconds 0.9678ms/image 103.3 images/s

Loaded Class 4 Images: 1980 Took 19.7168 seconds 0.9958ms/image 100.4 images/s

Loaded Class 5 Images: 1860 Took 18.4460 seconds 0.9917ms/image 100.8 images/s

Loaded Class 6 Images: 0420 Took 03.6495 seconds 0.8689ms/image 115.1 images/s

Loaded Class 7 Images: 1440 Took 19.7552 seconds 1.3719ms/image 72.9 images/s

Loaded Class 8 Images: 1410 Took 13.4999 seconds 0.9574ms/image 104.4 images/s

Loaded Class 9 Images: 1470 Took 12.5066 seconds 0.8508ms/image 117.5 images/s

Loaded Class 10 Images: 2010 Took 20.7217 seconds 1.0309ms/image 97.0 images/s

Loaded Class 11 Images: 1320 Took 11.1189 seconds 0.8423ms/image 118.7 images/s

Loaded Class 12 Images: 2100 Took 22.1780 seconds 1.0561ms/image 94.7 images/s

Loaded Class 13 Images: 2160 Took 21.2717 seconds 0.9848ms/image 101.5 images/s

Loaded Class 14 Images: 0780 Took 06.5370 seconds 0.8381ms/image 119.3 images/s

Loaded Class 15 Images: 0630 Took 08.6232 seconds 1.3688ms/image 73.1 images/s

Loaded Class 16 Images: 0420 Took 03.6972 seconds 0.8803ms/image 113.6 images/s

Loaded Class 17 Images: 1110 Took 10.4584 seconds 0.9422ms/image 106.1 images/s

Loaded Class 18 Images: 1200 Took 09.9258 seconds 0.8271ms/image 120.9 images/s

Loaded Class 19 Images: 0210 Took 02.7839 seconds 1.3256ms/image 75.4 images/s

Loaded Class 20 Images: 0360 Took 05.9180 seconds 1.6439ms/image 60.8 images/s

Loaded Class 21 Images: 0330 Took 03.0134 seconds 0.9132ms/image 109.5 images/s

Loaded Class 22 Images: 0390 Took 03.4392 seconds 0.8818ms/image 113.4 images/s

Loaded Class 23 Images: 0510 Took 04.8263 seconds 0.9463ms/image 105.7 images/s

Loaded Class 24 Images: 0270 Took 04.0966 seconds 1.5172ms/image 65.9 images/s

Loaded Class 25 Images: 1500 Took 13.7191 seconds 0.9146ms/image 109.3 images/s

Loaded Class 26 Images: 0600 Took 07.0660 seconds 1.1777ms/image 84.9 images/s

Loaded Class 27 Images: 0240 Took 02.2840 seconds 0.9517ms/image 105.1 images/s

Loaded Class 28 Images: 0540 Took 07.1667 seconds 1.3272ms/image 75.3 images/s

Loaded Class 29 Images: 0270 Took 02.5167 seconds 0.9321ms/image 107.3 images/s

Loaded Class 30 Images: 0450 Took 03.8860 seconds 0.8636ms/image 115.8 images/s

Loaded Class 31 Images: 0780 Took 08.1923 seconds 1.0503ms/image 95.2 images/s

Loaded Class 32 Images: 0240 Took 02.2317 seconds 0.9299ms/image 107.5 images/s

Loaded Class 33 Images: 0689 Took 05.7561 seconds 0.8354ms/image 119.7 images/s

Loaded Class 34 Images: 0420 Took 04.5002 seconds 1.0715ms/image 93.3 images/s

Loaded Class 35 Images: 1200 Took 12.5521 seconds 1.0460ms/image 95.6 images/s

Loaded Class 36 Images: 0390 Took 03.3022 seconds 0.8467ms/image 118.1 images/s

Loaded Class 37 Images: 0210 Took 02.9193 seconds 1.3902ms/image 71.9 images/s

Loaded Class 38 Images: 2070 Took 21.2446 seconds 1.0263ms/image 97.4 images/s

Loaded Class 39 Images: 0300 Took 02.8054 seconds 0.9351ms/image 106.9 images/s

Loaded Class 40 Images: 0360 Took 03.1062 seconds 0.8628ms/image 115.9 images/s

Loaded Class 41 Images: 0240 Took 02.1348 seconds 0.8895ms/image 112.4 images/s

Loaded Class 42 Images: 0240 Took 02.1978 seconds 0.9158ms/image 109.2 images/s

Loaded training dataset in 395.7781 seconds

Total Images Loaded: 39209

Loading Validation Dataset...

Processed 01000 images in 19.6665 seconds 1.9667ms/image 50.8 images/s

Processed 02000 images in 7.7877 seconds 0.7788ms/image 128.4 images/s

Processed 03000 images in 13.0755 seconds 1.3075ms/image 76.5 images/s

Processed 04000 images in 9.3641 seconds 0.9364ms/image 106.8 images/s

Processed 05000 images in 10.8513 seconds 1.0851ms/image 92.2 images/s

Processed 06000 images in 11.2805 seconds 1.1281ms/image 88.6 images/s

Processed 07000 images in 8.8364 seconds 0.8836ms/image 113.2 images/s

Processed 08000 images in 13.1189 seconds 1.3119ms/image 76.2 images/s

Processed 09000 images in 7.8151 seconds 0.7815ms/image 128.0 images/s

Processed 10000 images in 13.8667 seconds 1.3867ms/image 72.1 images/s

Processed 11000 images in 13.6059 seconds 1.3606ms/image 73.5 images/s

Processed 12000 images in 12.7749 seconds 1.2775ms/image 78.3 images/s

Loaded validation dataset in 148.6228 seconds

Total Images Loaded: 12630

Verifying Data Shapes...

Training Set Shapes: Images: (39209, 28, 28, 3) Labels: (39209,)

Validation Set Shapes: Images: (12630, 28, 28, 3) Labels: (12630,)

Model: "sequential\_1"

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Layer (type) Output Shape Param #

=================================================================

conv2d\_6 (Conv2D) (None, 28, 28, 32) 1568

activation\_9 (Activation) (None, 28, 28, 32) 0

batch\_normalization\_8 (Bat (None, 28, 28, 32) 128

chNormalization)

max\_pooling2d\_3 (MaxPoolin (None, 14, 14, 32) 0

g2D)

conv2d\_7 (Conv2D) (None, 14, 14, 64) 32832

activation\_10 (Activation) (None, 14, 14, 64) 0

batch\_normalization\_9 (Bat (None, 14, 14, 64) 256

chNormalization)

conv2d\_8 (Conv2D) (None, 14, 14, 64) 65600

activation\_11 (Activation) (None, 14, 14, 64) 0

batch\_normalization\_10 (Ba (None, 14, 14, 64) 256

tchNormalization)

max\_pooling2d\_4 (MaxPoolin (None, 7, 7, 64) 0

g2D)

conv2d\_9 (Conv2D) (None, 7, 7, 128) 131200

activation\_12 (Activation) (None, 7, 7, 128) 0

batch\_normalization\_11 (Ba (None, 7, 7, 128) 512

tchNormalization)

conv2d\_10 (Conv2D) (None, 7, 7, 128) 262272

activation\_13 (Activation) (None, 7, 7, 128) 0

batch\_normalization\_12 (Ba (None, 7, 7, 128) 512

tchNormalization)

conv2d\_11 (Conv2D) (None, 7, 7, 128) 262272

activation\_14 (Activation) (None, 7, 7, 128) 0

batch\_normalization\_13 (Ba (None, 7, 7, 128) 512

tchNormalization)

max\_pooling2d\_5 (MaxPoolin (None, 3, 3, 128) 0

g2D)

flatten\_2 (Flatten) (None, 1152) 0

dense\_3 (Dense) (None, 128) 147584

activation\_15 (Activation) (None, 128) 0

batch\_normalization\_14 (Ba (None, 128) 512

tchNormalization)

dropout\_2 (Dropout) (None, 128) 0

flatten\_3 (Flatten) (None, 128) 0

dense\_4 (Dense) (None, 128) 16512

activation\_16 (Activation) (None, 128) 0

batch\_normalization\_15 (Ba (None, 128) 512

tchNormalization)

dropout\_3 (Dropout) (None, 128) 0

dense\_5 (Dense) (None, 43) 5547

activation\_17 (Activation) (None, 43) 0

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Total params: 928587 (3.54 MB)

Trainable params: 926987 (3.54 MB)

Non-trainable params: 1600 (6.25 KB)

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Epoch 1/5

612/612 [==============================] - 422s 686ms/step - loss: 2.6728 - accuracy: 0.2926 - val\_loss: 3.9410 - val\_accuracy: 0.0833

Epoch 2/5

612/612 [==============================] - 426s 697ms/step - loss: 1.1899 - accuracy: 0.6264 - val\_loss: 0.7993 - val\_accuracy: 0.7330

Epoch 3/5

612/612 [==============================] - 441s 721ms/step - loss: 0.6829 - accuracy: 0.7854 - val\_loss: 4.2349 - val\_accuracy: 0.1404

Epoch 4/5

612/612 [==============================] - 442s 721ms/step - loss: 0.4513 - accuracy: 0.8624 - val\_loss: 0.4787 - val\_accuracy: 0.8535

Epoch 5/5

612/612 [==============================] - 443s 725ms/step - loss: 0.3215 - accuracy: 0.9049 - val\_loss: 0.2021 - val\_accuracy: 0.9405

/usr/local/lib/python3.10/dist-packages/keras/src/engine/training.py:3103: UserWarning: You are saving your model as an HDF5 file via `model.save()`. This file format is considered legacy. We recommend using instead the native Keras format, e.g. `model.save('my\_model.keras')`.

saving\_api.save\_model(



