\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Layer (type) Output Shape Param #

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

conv2d\_6 (Conv2D) (None, 28, 28, 32) 320

max\_pooling2d\_4 (MaxPooling (None, 14, 14, 32) 0

2D)

conv2d\_7 (Conv2D) (None, 12, 12, 64) 18496

max\_pooling2d\_5 (MaxPooling (None, 6, 6, 64) 0

2D)

conv2d\_8 (Conv2D) (None, 4, 4, 256) 147712

flatten\_2 (Flatten) (None, 4096) 0

dense\_7 (Dense) (None, 256) 1048832

dropout\_4 (Dropout) (None, 256) 0

dense\_8 (Dense) (None, 128) 32896

dropout\_5 (Dropout) (None, 128) 0

dense\_9 (Dense) (None, 64) 8256

dropout\_6 (Dropout) (None, 64) 0

dense\_10 (Dense) (None, 47) 3055

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

Total params: 1,259,567

Trainable params: 1,259,567

Non-trainable params: 0

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A graph of a line and a line

Description automatically generated with medium confidence

1175/1175 [==============================] - 1s 1ms/step - loss: 0.4354 - accuracy: 0.8766

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Layer (type) Output Shape Param #

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

conv2d\_15 (Conv2D) (None, 28, 28, 32) 320

max\_pooling2d\_10 (MaxPoolin (None, 14, 14, 32) 0

g2D)

conv2d\_16 (Conv2D) (None, 12, 12, 64) 18496

max\_pooling2d\_11 (MaxPoolin (None, 6, 6, 64) 0

g2D)

conv2d\_17 (Conv2D) (None, 4, 4, 256) 147712

flatten\_5 (Flatten) (None, 4096) 0

dense\_17 (Dense) (None, 256) 1048832

dense\_18 (Dense) (None, 128) 32896

dropout\_9 (Dropout) (None, 128) 0

dense\_19 (Dense) (None, 64) 8256

dropout\_10 (Dropout) (None, 64) 0

dense\_20 (Dense) (None, 47) 3055

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

Total params: 1,259,567

Trainable params: 1,259,567

Non-trainable params: 0

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A comparison of graphs with green and blue lines

Description automatically generated

1175/1175 [==============================] - 2s 1ms/step - loss: 0.4410 - accuracy: 0.8766

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Layer (type) Output Shape Param #

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

conv2d\_9 (Conv2D) (None, 28, 28, 32) 320

max\_pooling2d\_6 (MaxPooling (None, 14, 14, 32) 0

2D)

conv2d\_10 (Conv2D) (None, 12, 12, 64) 18496

max\_pooling2d\_7 (MaxPooling (None, 6, 6, 64) 0

2D)

conv2d\_11 (Conv2D) (None, 4, 4, 128) 73856

flatten\_3 (Flatten) (None, 2048) 0

dense\_11 (Dense) (None, 64) 131136

dense\_12 (Dense) (None, 64) 4160

dropout\_7 (Dropout) (None, 64) 0

dense\_13 (Dense) (None, 47) 3055

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

Total params: 231,023

Trainable params: 231,023

Non-trainable params: 0

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_A comparison of graphs with green and blue lines

Description automatically generated

1175/1175 [==============================] - 2s 1ms/step - loss: 0.4386 - accuracy: 0.8795

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Layer (type) Output Shape Param #

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

conv2d\_3 (Conv2D) (None, 28, 28, 32) 1184

max\_pooling2d\_2 (MaxPooling (None, 9, 9, 32) 0

2D)

conv2d\_4 (Conv2D) (None, 9, 9, 64) 32832

max\_pooling2d\_3 (MaxPooling (None, 4, 4, 64) 0

2D)

conv2d\_5 (Conv2D) (None, 2, 2, 256) 147712

flatten\_1 (Flatten) (None, 1024) 0

dense\_3 (Dense) (None, 256) 262400

dropout\_1 (Dropout) (None, 256) 0

dense\_4 (Dense) (None, 128) 32896

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

dense\_5 (Dense) (None, 64) 8256

dropout\_3 (Dropout) (None, 64) 0

dense\_6 (Dense) (None, 47) 3055

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

Total params: 488,335

Trainable params: 488,335

Non-trainable params: 0

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A comparison of a graph

Description automatically generated

1175/1175 [==============================] - 2s 1ms/step - loss: 0.4756 - accuracy: 0.8741

xs

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Layer (type) Output Shape Param #

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

conv2d\_18 (Conv2D) (None, 28, 28, 32) 1184

max\_pooling2d\_12 (MaxPoolin (None, 9, 9, 32) 0

g2D)

conv2d\_19 (Conv2D) (None, 9, 9, 64) 32832

max\_pooling2d\_13 (MaxPoolin (None, 4, 4, 64) 0

g2D)

conv2d\_20 (Conv2D) (None, 2, 2, 128) 73856

flatten\_6 (Flatten) (None, 512) 0

dense\_21 (Dense) (None, 64) 32832

dense\_22 (Dense) (None, 64) 4160

dropout\_11 (Dropout) (None, 64) 0

dense\_23 (Dense) (None, 47) 3055

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

Total params: 147,919

Trainable params: 147,919

Non-trainable params: 0

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A comparison of a graph

Description automatically generated

1175/1175 [==============================] - 2s 1ms/step - loss: 0.4268 - accuracy: 0.8755

He\_normal, l2, xxs

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Layer (type) Output Shape Param #

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

conv2d\_57 (Conv2D) (None, 26, 26, 16) 160

max\_pooling2d\_38 (MaxPoolin (None, 13, 13, 16) 0

g2D)

conv2d\_58 (Conv2D) (None, 11, 11, 16) 2320

max\_pooling2d\_39 (MaxPoolin (None, 5, 5, 16) 0

g2D)

conv2d\_59 (Conv2D) (None, 3, 3, 16) 2320

flatten\_19 (Flatten) (None, 144) 0

dense\_38 (Dense) (None, 47) 6815

dense\_39 (Dense) (None, 47) 2256

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

Total params: 13,871

Trainable params: 13,871

Non-trainable params: 0

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Description automatically generated

1175/1175 [==============================] - 1s 1ms/step - loss: 0.3963 - accuracy: 0.8689

He\_normal, l2, large

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Layer (type) Output Shape Param #

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

conv2d\_96 (Conv2D) (None, 26, 26, 32) 320

max\_pooling2d\_64 (MaxPoolin (None, 13, 13, 32) 0

g2D)

conv2d\_97 (Conv2D) (None, 11, 11, 64) 18496

max\_pooling2d\_65 (MaxPoolin (None, 5, 5, 64) 0

g2D)

conv2d\_98 (Conv2D) (None, 3, 3, 128) 73856

flatten\_32 (Flatten) (None, 1152) 0

dense\_72 (Dense) (None, 256) 295168

dense\_73 (Dense) (None, 128) 32896

dense\_74 (Dense) (None, 64) 8256

dense\_75 (Dense) (None, 47) 3055

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

Total params: 432,047

Trainable params: 432,047

Non-trainable params: 0

A comparison of a graph

Description automatically generated

1175/1175 [==============================] - 2s 1ms/step - loss: 0.3861 - accuracy: 0.8804

He\_normal, l2, xs

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Layer (type) Output Shape Param #

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

conv2d\_180 (Conv2D) (None, 28, 28, 32) 1184

max\_pooling2d\_120 (MaxPooli (None, 9, 9, 32) 0

ng2D)

conv2d\_181 (Conv2D) (None, 9, 9, 64) 32832

max\_pooling2d\_121 (MaxPooli (None, 4, 4, 64) 0

ng2D)

conv2d\_182 (Conv2D) (None, 2, 2, 128) 73856

flatten\_60 (Flatten) (None, 512) 0

dense\_180 (Dense) (None, 64) 32832

dropout\_37 (Dropout) (None, 64) 0

dense\_181 (Dense) (None, 64) 4160

dropout\_38 (Dropout) (None, 64) 0

dense\_182 (Dense) (None, 47) 3055

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

Total params: 147,919

Trainable params: 147,919

Non-trainable params: 0

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_A comparison of a graph

Description automatically generated

1175/1175 [==============================] - 1s 1ms/step - loss: 0.3657 - accuracy: 0.8823

He\_normal, xxs

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Layer (type) Output Shape Param #

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

conv2d\_3 (Conv2D) (None, 26, 26, 16) 160

max\_pooling2d\_2 (MaxPooling (None, 13, 13, 16) 0

2D)

conv2d\_4 (Conv2D) (None, 11, 11, 16) 2320

max\_pooling2d\_3 (MaxPooling (None, 5, 5, 16) 0

2D)

conv2d\_5 (Conv2D) (None, 3, 3, 16) 2320

flatten\_1 (Flatten) (None, 144) 0

dense\_2 (Dense) (None, 47) 6815

dropout\_1 (Dropout) (None, 47) 0

dense\_3 (Dense) (None, 47) 2256

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

Total params: 13,871

Trainable params: 13,871

Non-trainable params: 0

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A comparison of a graph

Description automatically generated

1175/1175 [==============================] - 1s 1ms/step - loss: 0.4223 - accuracy: 0.8590

xxs

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Layer (type) Output Shape Param #

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

conv2d\_6 (Conv2D) (None, 26, 26, 16) 160

max\_pooling2d\_4 (MaxPooling (None, 13, 13, 16) 0

2D)

conv2d\_7 (Conv2D) (None, 11, 11, 16) 2320

max\_pooling2d\_5 (MaxPooling (None, 5, 5, 16) 0

2D)

conv2d\_8 (Conv2D) (None, 3, 3, 16) 2320

flatten\_2 (Flatten) (None, 144) 0

dense\_4 (Dense) (None, 47) 6815

dropout\_2 (Dropout) (None, 47) 0

dense\_5 (Dense) (None, 47) 2256

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

Total params: 13,871

Trainable params: 13,871

Non-trainable params: 0

A comparison of a graph

Description automatically generated

1175/1175 [==============================] - 1s 1ms/step - loss: 0.4324 - accuracy: 0.8556