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Layer (type) Output Shape Param #

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

input\_2 (InputLayer) [(None, 224, 224, 3)] 0

block1\_conv1 (Conv2D) (None, 224, 224, 64) 1792

block1\_conv2 (Conv2D) (None, 224, 224, 64) 36928

block1\_pool (MaxPooling2D) (None, 112, 112, 64) 0

block2\_conv1 (Conv2D) (None, 112, 112, 128) 73856

block2\_conv2 (Conv2D) (None, 112, 112, 128) 147584

block2\_pool (MaxPooling2D) (None, 56, 56, 128) 0

block3\_conv1 (Conv2D) (None, 56, 56, 256) 295168

block3\_conv2 (Conv2D) (None, 56, 56, 256) 590080

block3\_conv3 (Conv2D) (None, 56, 56, 256) 590080

block3\_pool (MaxPooling2D) (None, 28, 28, 256) 0

block4\_conv1 (Conv2D) (None, 28, 28, 512) 1180160

block4\_conv2 (Conv2D) (None, 28, 28, 512) 2359808

block4\_conv3 (Conv2D) (None, 28, 28, 512) 2359808

block4\_pool (MaxPooling2D) (None, 14, 14, 512) 0

block5\_conv1 (Conv2D) (None, 14, 14, 512) 2359808

block5\_conv2 (Conv2D) (None, 14, 14, 512) 2359808

block5\_conv3 (Conv2D) (None, 14, 14, 512) 2359808

block5\_pool (MaxPooling2D) (None, 7, 7, 512) 0

flatten (Flatten) (None, 25088) 0

dense (Dense) (None, 1) 25089

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Total params: 14,739,777

Trainable params: 25,089

Non-trainable params: 14,714,688

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Epoch 1/100

70/70 [==============================] - 479s 7s/step - loss: 0.4022 - accuracy: 0.8177 - val\_loss: 0.2561 - val\_accuracy: 0.8961 - lr: 0.0010

Epoch 2/100

70/70 [==============================] - 97s 1s/step - loss: 0.2438 - accuracy: 0.8911 - val\_loss: 0.2198 - val\_accuracy: 0.9050 - lr: 0.0010

Epoch 3/100

70/70 [==============================] - 94s 1s/step - loss: 0.1992 - accuracy: 0.9203 - val\_loss: 0.2123 - val\_accuracy: 0.9158 - lr: 0.0010

Epoch 4/100

70/70 [==============================] - 96s 1s/step - loss: 0.1712 - accuracy: 0.9310 - val\_loss: 0.1963 - val\_accuracy: 0.9122 - lr: 0.0010

Epoch 5/100

70/70 [==============================] - 94s 1s/step - loss: 0.1548 - accuracy: 0.9462 - val\_loss: 0.1626 - val\_accuracy: 0.9319 - lr: 0.0010

Epoch 6/100

70/70 [==============================] - 96s 1s/step - loss: 0.1439 - accuracy: 0.9503 - val\_loss: 0.1438 - val\_accuracy: 0.9552 - lr: 0.0010

Epoch 7/100

70/70 [==============================] - 95s 1s/step - loss: 0.1424 - accuracy: 0.9440 - val\_loss: 0.1513 - val\_accuracy: 0.9462 - lr: 0.0010

Epoch 8/100

70/70 [==============================] - 95s 1s/step - loss: 0.1454 - accuracy: 0.9449 - val\_loss: 0.1449 - val\_accuracy: 0.9427 - lr: 0.0010

Epoch 9/100

70/70 [==============================] - 94s 1s/step - loss: 0.1223 - accuracy: 0.9547 - val\_loss: 0.1339 - val\_accuracy: 0.9427 - lr: 0.0010

Epoch 10/100

70/70 [==============================] - 94s 1s/step - loss: 0.1229 - accuracy: 0.9521 - val\_loss: 0.1423 - val\_accuracy: 0.9409 - lr: 0.0010

Epoch 11/100

70/70 [==============================] - 88s 1s/step - loss: 0.1112 - accuracy: 0.9606 - val\_loss: 0.1334 - val\_accuracy: 0.9534 - lr: 0.0010

Epoch 12/100

70/70 [==============================] - 91s 1s/step - loss: 0.1220 - accuracy: 0.9597 - val\_loss: 0.1443 - val\_accuracy: 0.9444 - lr: 0.0010

Epoch 13/100

70/70 [==============================] - 92s 1s/step - loss: 0.1061 - accuracy: 0.9592 - val\_loss: 0.1211 - val\_accuracy: 0.9588 - lr: 0.0010

Epoch 14/100

70/70 [==============================] - 90s 1s/step - loss: 0.1134 - accuracy: 0.9615 - val\_loss: 0.1159 - val\_accuracy: 0.9534 - lr: 0.0010

Epoch 15/100

70/70 [==============================] - 90s 1s/step - loss: 0.1029 - accuracy: 0.9655 - val\_loss: 0.1327 - val\_accuracy: 0.9534 - lr: 0.0010

Epoch 16/100

70/70 [==============================] - 91s 1s/step - loss: 0.0907 - accuracy: 0.9668 - val\_loss: 0.1209 - val\_accuracy: 0.9480 - lr: 0.0010

Epoch 17/100

70/70 [==============================] - 91s 1s/step - loss: 0.1006 - accuracy: 0.9637 - val\_loss: 0.1366 - val\_accuracy: 0.9552 - lr: 0.0010

Epoch 18/100

70/70 [==============================] - 91s 1s/step - loss: 0.0860 - accuracy: 0.9709 - val\_loss: 0.1048 - val\_accuracy: 0.9606 - lr: 1.0000e-04

Epoch 19/100

70/70 [==============================] - 91s 1s/step - loss: 0.0836 - accuracy: 0.9736 - val\_loss: 0.0993 - val\_accuracy: 0.9606 - lr: 1.0000e-04

Epoch 20/100

70/70 [==============================] - 91s 1s/step - loss: 0.0837 - accuracy: 0.9709 - val\_loss: 0.1157 - val\_accuracy: 0.9606 - lr: 1.0000e-04

Epoch 21/100

70/70 [==============================] - 91s 1s/step - loss: 0.0735 - accuracy: 0.9731 - val\_loss: 0.1137 - val\_accuracy: 0.9552 - lr: 1.0000e-04

Epoch 22/100

70/70 [==============================] - 90s 1s/step - loss: 0.0761 - accuracy: 0.9754 - val\_loss: 0.1101 - val\_accuracy: 0.9534 - lr: 1.0000e-04

Epoch 23/100

70/70 [==============================] - 89s 1s/step - loss: 0.0828 - accuracy: 0.9731 - val\_loss: 0.1290 - val\_accuracy: 0.9462 - lr: 1.0000e-05

Epoch 24/100

70/70 [==============================] - 92s 1s/step - loss: 0.0699 - accuracy: 0.9785 - val\_loss: 0.1034 - val\_accuracy: 0.9713 - lr: 1.0000e-05

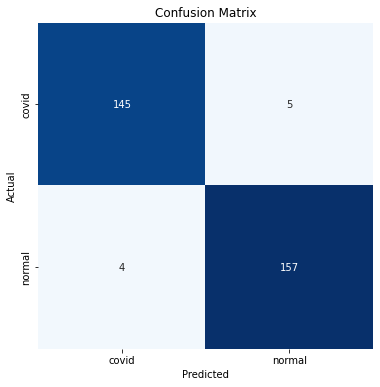
INFO:tensorflow:Assets written to: /content/drive/MyDrive/vgg16/assets

Test Loss: 0.07453

Test Accuracy: 97.11%

/usr/local/lib/python3.7/dist-packages/ipykernel\_launcher.py:123: DeprecationWarning: `np.int` is a deprecated alias for the builtin `int`. To silence this warning, use `int` by itself. Doing this will not modify any behavior and is safe. When replacing `np.int`, you may wish to use e.g. `np.int64` or `np.int32` to specify the precision. If you wish to review your current use, check the release note link for additional information.

Deprecated in NumPy 1.20; for more details and guidance: <https://numpy.org/devdocs/release/1.20.0-notes.html#deprecations>



Classification Report:

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precision recall f1-score support

covid 0.97 0.97 0.97 150

normal 0.97 0.98 0.97 161

accuracy 0.97 311

macro avg 0.97 0.97 0.97 311

weighted avg 0.97 0.97 0.97 311

INFO:tensorflow:Assets written to: /content/drive/MyDrive/vgg16/assets

