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

Layer (type) Output Shape Param #

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

input\_4 (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\_conv4 (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\_conv4 (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\_conv4 (Conv2D) (None, 14, 14, 512) 2359808

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

flatten\_1 (Flatten) (None, 25088) 0

dense\_1 (Dense) (None, 1) 25089

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Total params: 20,049,473

Trainable params: 25,089

Non-trainable params: 20,024,384

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Epoch 1/100

55/55 [==============================] - 52s 930ms/step - loss: 0.3632 - accuracy: 0.8312 - val\_loss: 0.1810 - val\_accuracy: 0.9332 - lr: 0.0010

Epoch 2/100

55/55 [==============================] - 51s 922ms/step - loss: 0.1296 - accuracy: 0.9591 - val\_loss: 0.1234 - val\_accuracy: 0.9608 - lr: 0.0010

Epoch 3/100

55/55 [==============================] - 50s 906ms/step - loss: 0.1001 - accuracy: 0.9654 - val\_loss: 0.0982 - val\_accuracy: 0.9585 - lr: 0.0010

Epoch 4/100

55/55 [==============================] - 50s 903ms/step - loss: 0.0747 - accuracy: 0.9781 - val\_loss: 0.0884 - val\_accuracy: 0.9654 - lr: 0.0010

Epoch 5/100

55/55 [==============================] - 49s 895ms/step - loss: 0.0590 - accuracy: 0.9827 - val\_loss: 0.0808 - val\_accuracy: 0.9631 - lr: 0.0010

Epoch 6/100

55/55 [==============================] - 50s 914ms/step - loss: 0.0544 - accuracy: 0.9879 - val\_loss: 0.1038 - val\_accuracy: 0.9654 - lr: 0.0010

Epoch 7/100

55/55 [==============================] - 51s 933ms/step - loss: 0.0630 - accuracy: 0.9793 - val\_loss: 0.0806 - val\_accuracy: 0.9654 - lr: 0.0010

Epoch 8/100

55/55 [==============================] - 49s 890ms/step - loss: 0.0416 - accuracy: 0.9902 - val\_loss: 0.0692 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 9/100

55/55 [==============================] - 48s 880ms/step - loss: 0.0331 - accuracy: 0.9931 - val\_loss: 0.0712 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 10/100

55/55 [==============================] - 49s 901ms/step - loss: 0.0323 - accuracy: 0.9914 - val\_loss: 0.0736 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 11/100

55/55 [==============================] - 50s 909ms/step - loss: 0.0251 - accuracy: 0.9960 - val\_loss: 0.0658 - val\_accuracy: 0.9770 - lr: 0.0010

Epoch 12/100

55/55 [==============================] - 51s 932ms/step - loss: 0.0239 - accuracy: 0.9948 - val\_loss: 0.0700 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 13/100

55/55 [==============================] - 49s 889ms/step - loss: 0.0207 - accuracy: 0.9977 - val\_loss: 0.0656 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 14/100

55/55 [==============================] - 48s 892ms/step - loss: 0.0189 - accuracy: 0.9971 - val\_loss: 0.0630 - val\_accuracy: 0.9747 - lr: 0.0010

Epoch 15/100

55/55 [==============================] - 51s 937ms/step - loss: 0.0172 - accuracy: 0.9983 - val\_loss: 0.0628 - val\_accuracy: 0.9770 - lr: 0.0010

Epoch 16/100

55/55 [==============================] - 51s 930ms/step - loss: 0.0172 - accuracy: 0.9983 - val\_loss: 0.0614 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 17/100

55/55 [==============================] - 50s 903ms/step - loss: 0.0151 - accuracy: 0.9988 - val\_loss: 0.0637 - val\_accuracy: 0.9724 - lr: 0.0010

Epoch 18/100

55/55 [==============================] - 49s 908ms/step - loss: 0.0141 - accuracy: 0.9988 - val\_loss: 0.0818 - val\_accuracy: 0.9608 - lr: 0.0010

Epoch 19/100

55/55 [==============================] - 51s 919ms/step - loss: 0.0132 - accuracy: 0.9988 - val\_loss: 0.0611 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 20/100

55/55 [==============================] - 48s 876ms/step - loss: 0.0118 - accuracy: 0.9994 - val\_loss: 0.0609 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 21/100

55/55 [==============================] - 48s 855ms/step - loss: 0.0107 - accuracy: 0.9988 - val\_loss: 0.0614 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 22/100

55/55 [==============================] - 49s 882ms/step - loss: 0.0100 - accuracy: 0.9994 - val\_loss: 0.0599 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 23/100

55/55 [==============================] - 48s 879ms/step - loss: 0.0102 - accuracy: 0.9988 - val\_loss: 0.0591 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 24/100

55/55 [==============================] - 48s 871ms/step - loss: 0.0087 - accuracy: 1.0000 - val\_loss: 0.0631 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 25/100

55/55 [==============================] - 48s 867ms/step - loss: 0.0080 - accuracy: 1.0000 - val\_loss: 0.0664 - val\_accuracy: 0.9700 - lr: 0.0010

Epoch 26/100

55/55 [==============================] - 48s 875ms/step - loss: 0.0075 - accuracy: 1.0000 - val\_loss: 0.0586 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 27/100

55/55 [==============================] - 48s 874ms/step - loss: 0.0076 - accuracy: 1.0000 - val\_loss: 0.0585 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 28/100

55/55 [==============================] - 49s 881ms/step - loss: 0.0067 - accuracy: 1.0000 - val\_loss: 0.0644 - val\_accuracy: 0.9724 - lr: 0.0010

Epoch 29/100

55/55 [==============================] - 49s 883ms/step - loss: 0.0063 - accuracy: 1.0000 - val\_loss: 0.0588 - val\_accuracy: 0.9793 - lr: 0.0010

Epoch 30/100

55/55 [==============================] - 49s 887ms/step - loss: 0.0057 - accuracy: 1.0000 - val\_loss: 0.0591 - val\_accuracy: 0.9793 - lr: 1.0000e-04

Epoch 31/100

55/55 [==============================] - 48s 880ms/step - loss: 0.0057 - accuracy: 1.0000 - val\_loss: 0.0584 - val\_accuracy: 0.9793 - lr: 1.0000e-04

Epoch 32/100

55/55 [==============================] - 47s 861ms/step - loss: 0.0057 - accuracy: 1.0000 - val\_loss: 0.0590 - val\_accuracy: 0.9793 - lr: 1.0000e-04

Epoch 33/100

55/55 [==============================] - 48s 868ms/step - loss: 0.0057 - accuracy: 1.0000 - val\_loss: 0.0588 - val\_accuracy: 0.9793 - lr: 1.0000e-04

Epoch 34/100

55/55 [==============================] - 48s 873ms/step - loss: 0.0056 - accuracy: 1.0000 - val\_loss: 0.0601 - val\_accuracy: 0.9770 - lr: 1.0000e-04

Epoch 35/100

55/55 [==============================] - 48s 880ms/step - loss: 0.0056 - accuracy: 1.0000 - val\_loss: 0.0595 - val\_accuracy: 0.9770 - lr: 1.0000e-05

Epoch 36/100

55/55 [==============================] - 48s 875ms/step - loss: 0.0055 - accuracy: 1.0000 - val\_loss: 0.0593 - val\_accuracy: 0.9793 - lr: 1.0000e-05

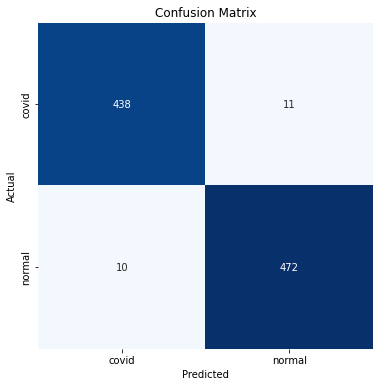
INFO:tensorflow:Assets written to: /content/drive/MyDrive/vgg19Split0.7NoAug/assets

Test Loss: 0.06917

Test Accuracy: 97.74%

/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 0.98 0.98 0.98 449

normal 0.98 0.98 0.98 482

accuracy 0.98 931

macro avg 0.98 0.98 0.98 931

weighted avg 0.98 0.98 0.98 931

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

