Model: "model"

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Layer (type) Output Shape Param #

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

input\_1 (InputLayer) [(None, 224, 224, 3)] 0

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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flatten (Flatten) (None, 25088) 0

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dense (Dense) (None, 6) 150534

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

Total params: 14,865,222

Trainable params: 150,534

Non-trainable params: 14,714,688

Found 899 images belonging to 6 classes.

Found 222 images belonging to 6 classes.

/usr/local/lib/python3.7/dist-packages/tensorflow/python/keras/engine/training.py:1940: UserWarning: `Model.fit\_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.

warnings.warn('`Model.fit\_generator` is deprecated and '

Epoch 1/20

8/8 [==============================] - 331s 42s/step - loss: 2.1260 - accuracy: 0.4438 - val\_loss: 0.9533 - val\_accuracy: 0.6712

Epoch 2/20

8/8 [==============================] - 320s 40s/step - loss: 0.7810 - accuracy: 0.7130 - val\_loss: 0.9017 - val\_accuracy: 0.6532

Epoch 3/20

8/8 [==============================] - 327s 41s/step - loss: 0.5621 - accuracy: 0.7875 - val\_loss: 0.5016 - val\_accuracy: 0.8198

Epoch 4/20

8/8 [==============================] - 320s 40s/step - loss: 0.3334 - accuracy: 0.8977 - val\_loss: 0.4363 - val\_accuracy: 0.8559

Epoch 5/20

8/8 [==============================] - 318s 40s/step - loss: 0.2537 - accuracy: 0.9310 - val\_loss: 0.3666 - val\_accuracy: 0.8874

Epoch 6/20

8/8 [==============================] - 322s 41s/step - loss: 0.1975 - accuracy: 0.9477 - val\_loss: 0.7118 - val\_accuracy: 0.7117

Epoch 7/20

8/8 [==============================] - 318s 40s/step - loss: 0.3513 - accuracy: 0.8665 - val\_loss: 0.3075 - val\_accuracy: 0.9054

Epoch 8/20

8/8 [==============================] - 322s 46s/step - loss: 0.1996 - accuracy: 0.9511 - val\_loss: 0.2966 - val\_accuracy: 0.9054

Epoch 9/20

8/8 [==============================] - 324s 41s/step - loss: 0.1392 - accuracy: 0.9733 - val\_loss: 0.2971 - val\_accuracy: 0.9054

Epoch 10/20

8/8 [==============================] - 319s 40s/step - loss: 0.1047 - accuracy: 0.9811 - val\_loss: 0.2648 - val\_accuracy: 0.9144

Epoch 11/20

8/8 [==============================] - 320s 40s/step - loss: 0.0986 - accuracy: 0.9867 - val\_loss: 0.2682 - val\_accuracy: 0.9099

Epoch 12/20

8/8 [==============================] - 323s 41s/step - loss: 0.0819 - accuracy: 0.9911 - val\_loss: 0.2536 - val\_accuracy: 0.9144

Epoch 13/20

8/8 [==============================] - 326s 41s/step - loss: 0.0716 - accuracy: 0.9956 - val\_loss: 0.2555 - val\_accuracy: 0.9099

Epoch 14/20

8/8 [==============================] - 319s 40s/step - loss: 0.0693 - accuracy: 0.9922 - val\_loss: 0.2935 - val\_accuracy: 0.9099

Epoch 15/20

8/8 [==============================] - 317s 40s/step - loss: 0.0625 - accuracy: 0.9944 - val\_loss: 0.2228 - val\_accuracy: 0.9234

Epoch 16/20

8/8 [==============================] - 327s 41s/step - loss: 0.0503 - accuracy: 0.9944 - val\_loss: 0.2302 - val\_accuracy: 0.9234

Epoch 17/20

8/8 [==============================] - 324s 41s/step - loss: 0.0453 - accuracy: 0.9978 - val\_loss: 0.2121 - val\_accuracy: 0.9369

Epoch 18/20

8/8 [==============================] - 325s 41s/step - loss: 0.0358 - accuracy: 1.0000 - val\_loss: 0.2122 - val\_accuracy: 0.9369

Epoch 19/20

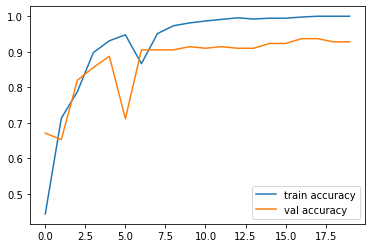
8/8 [==============================] - 324s 41s/step - loss: 0.0338 - accuracy: 1.0000 - val\_loss: 0.2222 - val\_accuracy: 0.9279

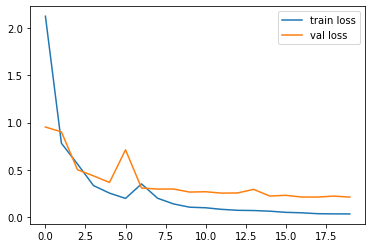
Epoch 20/20

8/8 [==============================] - 318s 40s/step - loss: 0.0335 - accuracy: 1.0000 - val\_loss: 0.2114 - val\_accuracy: 0.9279

Time: 6794.88 sec.

Time to run all : 1:53:14.879909





[[ 75 59 1 0 14 0]

[ 2 146 1 0 1 0]

[ 2 30 110 0 8 0]

[ 0 41 0 107 2 0]

[ 3 47 0 0 100 0]

[ 0 52 0 0 0 98]]

Accuracy: 0.707453

Error rate: 0.292547

classification\_report

precision recall f1-score support

0 0.91 0.50 0.65 149

1 0.39 0.97 0.56 150

2 0.98 0.73 0.84 150

3 1.00 0.71 0.83 150

4 0.80 0.67 0.73 150

5 1.00 0.65 0.79 150

accuracy 0.71 899

macro avg 0.85 0.71 0.73 899

weighted avg 0.85 0.71 0.73 899

Cohens kappa: 0.648908