

https://keras.io/api/applications/inceptionresnetv2/

In [1]:

```
import tensorflow as tf
import numpy as np
import pandas as pd
from sklearn.metrics import classification_report, confusion_matrix
import matplotlib.pyplot as plt
import seaborn as sns
import os
```

In [2]:

```
INFO:tensorflow:Enabling eager execution
INFO:tensorflow:Enabling v2 tensorshape
INFO:tensorflow:Enabling resource variables
INFO:tensorflow:Enabling tensor equality
INFO:tensorflow:Enabling control flow v2
```

In [3]:

```
epochs = 500 # quantidade de vezes a ser executado o algoritmo, uma epoch é quanto to
batch = 32 # número de amostras que será carregado a cada execução
```

In [4]:

```
#carrega o modelo da InceptionResNetV2 com os pesos aprendidos no treino da Inception
base_model = tf.keras.applications.InceptionResNetV2(weights='imagenet', include_top=
```

In [4]:

```
# o restante do modelo e suas camadas não são discutidos a seguir
# x recebe o final da InceptionResNetV2
x=base_model.output
```

In [5]:

```
#Nova configuração para o modelo

#adiciona apos x uma camada GlobalMaxPooling2D e atribui este no a x novamente (logo
x=tf.keras.layers.GlobalMaxPooling2D()(x)

#adiciona apos x uma camada densa com 128 neurônios com funcao de ativacao relu. Atrib
x=tf.keras.layers.Dense(128,activation='relu')(x)

#adiciona apos x uma camada densa com 64 neurônios com funcao de ativacao relu. Atrib
x=tf.keras.layers.Dense(64,activation='relu')(x)

#adiciona apos x uma camada densa com 32 neurônios com funcao de ativacao relu. Atrib
x=tf.keras.layers.Dense(32,activation='relu')(x)

#adiciona apos x os neurônios que devem ser utilizados, nesse caso foram desligados 2
x=tf.keras.layers.Dropout(0.5)(x)

#adiciona apos x uma camada densa com 7 neurônios (sete classes) com funcao de ativac
preds=tf.keras.layers.Dense(3,activation='softmax')(x)
#preds=tf.keras.layers.Dense(3,activation='sigmoid')(x)

#definindo modelo final
model=tf.keras.models.Model(inputs=base_model.input,outputs=preds)

#mostrando modelo final e sua estrutura
model.summary()
```

| Model: | "model" | | |
|---------------------------------|-----------------------------|---------|-----------------------|
| Layer (type) | Output Shape | Param # | Connected to |
| ----- | | | |
| input_1 (InputLayer) | [(None, None, None, 0 | 0 | |
| ----- | | | |
| conv2d (Conv2D) | (None, None, None, 3 864 | | input_1[0][0] |
| ----- | | | |
| batch_normalization (BatchNorma | (None, None, None, 3 96 | | conv2d[0][0] |
| ----- | | | |
| activation (Activation) | (None, None, None, 3 0 | | batch_normalization |
| ----- | | | |
| conv2d_1 (Conv2D) | (None, None, None, 3 9216 | | activation[0][0] |
| ----- | | | |
| batch_normalization_1 (BatchNor | (None, None, None, 3 96 | | conv2d_1[0][0] |
| ----- | | | |
| activation_1 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| conv2d_2 (Conv2D) | (None, None, None, 6 18432 | | activation_1[0][0] |
| ----- | | | |
| batch_normalization_2 (BatchNor | (None, None, None, 6 192 | | conv2d_2[0][0] |
| ----- | | | |
| activation_2 (Activation) | (None, None, None, 6 0 | | batch_normalization_2 |
| ----- | | | |
| max_pooling2d (MaxPooling2D) | (None, None, None, 6 0 | | activation_2[0][0] |
| ----- | | | |
| conv2d_3 (Conv2D) | (None, None, None, 8 5120 | | max_pooling2d[0][0] |
| ----- | | | |
| batch_normalization_3 (BatchNor | (None, None, None, 8 240 | | conv2d_3[0][0] |
| ----- | | | |
| activation_3 (Activation) | (None, None, None, 8 0 | | batch_normalization_3 |
| ----- | | | |
| conv2d_4 (Conv2D) | (None, None, None, 1 138240 | | activation_3[0][0] |
| ----- | | | |
| batch_normalization_4 (BatchNor | (None, None, None, 1 576 | | conv2d_4[0][0] |
| ----- | | | |
| activation_4 (Activation) | (None, None, None, 1 0 | | batch_normalization_4 |
| ----- | | | |
| max_pooling2d_1 (MaxPooling2D) | (None, None, None, 1 0 | | activation_4[0][0] |
| ----- | | | |
| conv2d_8 (Conv2D) | (None, None, None, 6 12288 | | max_pooling2d_1[0][0] |
| ----- | | | |
| batch_normalization_8 (BatchNor | (None, None, None, 6 192 | | conv2d_8[0][0] |
| ----- | | | |
| activation_8 (Activation) | (None, None, None, 6 0 | | batch_normalization_8 |
| ----- | | | |
| conv2d_6 (Conv2D) | (None, None, None, 4 9216 | | max_pooling2d_1[0][0] |
| ----- | | | |
| conv2d_9 (Conv2D) | (None, None, None, 9 55296 | | activation_8[0][0] |
| ----- | | | |
| batch_normalization_6 (BatchNor | (None, None, None, 4 144 | | conv2d_6[0][0] |
| ----- | | | |
| batch_normalization_9 (BatchNor | (None, None, None, 9 288 | | conv2d_9[0][0] |
| ----- | | | |
| activation_6 (Activation) | (None, None, None, 4 0 | | batch_normalization_ |
| ----- | | | |
| activation_9 (Activation) | (None, None, None, 9 0 | | batch_normalization_ |
| ----- | | | |
| average_pooling2d (AveragePooli | (None, None, None, 1 0 | | max_pooling2d_1[0][0] |
| ----- | | | |
| conv2d_5 (Conv2D) | (None, None, None, 9 18432 | | max_pooling2d_1[0][0] |
| ----- | | | |
| conv2d_7 (Conv2D) | (None, None, None, 6 76800 | | activation_6[0][0] |
| ----- | | | |
| conv2d_10 (Conv2D) | (None, None, None, 9 82944 | | activation_9[0][0] |
| ----- | | | |
| conv2d_11 (Conv2D) | (None, None, None, 6 12288 | | average_pooling2d[0] |
| ----- | | | |
| batch_normalization_5 (BatchNor | (None, None, None, 9 288 | | conv2d_5[0][0] |
| ----- | | | |
| batch_normalization_7 (BatchNor | (None, None, None, 6 192 | | conv2d_7[0][0] |
| ----- | | | |
| batch_normalization_10 (BatchNo | (None, None, None, 9 288 | | conv2d_10[0][0] |
| ----- | | | |
| batch_normalization_11 (BatchNo | (None, None, None, 6 192 | | conv2d_11[0][0] |
| ----- | | | |
| activation_5 (Activation) | (None, None, None, 9 0 | | batch_normalization_5 |
| ----- | | | |
| activation_7 (Activation) | (None, None, None, 6 0 | | batch_normalization_7 |
| ----- | | | |
| activation_10 (Activation) | (None, None, None, 9 0 | | batch_normalization_1 |
| ----- | | | |
| activation_11 (Activation) | (None, None, None, 6 0 | | batch_normalization_1 |
| ----- | | | |
| mixed_5b (Concatenate) | (None, None, None, 3 0 | | activation_5[0][0] |
| ----- | | | |
| | | | activation_7[0][0] |
| ----- | | | |
| | | | activation_10[0][0] |
| ----- | | | |
| | | | activation_11[0][0] |
| ----- | | | |
| conv2d_15 (Conv2D) | (None, None, None, 3 10240 | | mixed_5b[0][0] |
| ----- | | | |
| batch_normalization_15 (BatchNo | (None, None, None, 3 96 | | conv2d_15[0][0] |
| ----- | | | |
| activation_15 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| conv2d_13 (Conv2D) | (None, None, None, 3 10240 | | mixed_5b[0][0] |
| ----- | | | |
| conv2d_16 (Conv2D) | (None, None, None, 4 13824 | | activation_15[0][0] |
| ----- | | | |
| batch_normalization_13 (BatchNo | (None, None, None, 3 96 | | conv2d_13[0][0] |
| ----- | | | |
| batch_normalization_16 (BatchNo | (None, None, None, 4 144 | | conv2d_16[0][0] |
| ----- | | | |
| activation_13 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| activation_16 (Activation) | (None, None, None, 4 0 | | batch_normalization_1 |
| ----- | | | |
| conv2d_12 (Conv2D) | (None, None, None, 3 10240 | | mixed_5b[0][0] |
| ----- | | | |
| conv2d_14 (Conv2D) | (None, None, None, 3 9216 | | activation_13[0][0] |
| ----- | | | |
| conv2d_17 (Conv2D) | (None, None, None, 6 27648 | | activation_16[0][0] |
| ----- | | | |
| batch_normalization_12 (BatchNo | (None, None, None, 3 96 | | conv2d_12[0][0] |
| ----- | | | |
| batch_normalization_14 (BatchNo | (None, None, None, 3 96 | | conv2d_14[0][0] |
| ----- | | | |
| batch_normalization_17 (BatchNo | (None, None, None, 6 192 | | conv2d_17[0][0] |
| ----- | | | |
| activation_12 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| activation_14 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| activation_17 (Activation) | (None, None, None, 6 0 | | batch_normalization_1 |
| ----- | | | |
| block35_1_mixed (Concatenate) | (None, None, None, 1 0 | | activation_12[0][0] |
| ----- | | | |
| | | | activation_14[0][0] |
| ----- | | | |
| | | | activation_17[0][0] |
| ----- | | | |
| block35_1_conv (Conv2D) | (None, None, None, 3 41280 | | block35_1_mixed[0][0] |
| ----- | | | |
| block35_1 (Lambda) | (None, None, None, 3 0 | | mixed_5b[0][0] |
| ----- | | | |
| block35_1_ac (Activation) | (None, None, None, 3 0 | | block35_1_conv[0][0] |
| ----- | | | |
| conv2d_21 (Conv2D) | (None, None, None, 3 10240 | | block35_1_ac[0][0] |
| ----- | | | |
| batch_normalization_21 (BatchNo | (None, None, None, 3 96 | | conv2d_21[0][0] |
| ----- | | | |
| activation_21 (Activation) | (None, None, None, 3 0 | | batch_normalization_2 |
| ----- | | | |
| conv2d_19 (Conv2D) | (None, None, None, 3 10240 | | block35_1_ac[0][0] |
| ----- | | | |
| conv2d_22 (Conv2D) | (None, None, None, 4 13824 | | activation_21[0][0] |
| ----- | | | |
| batch_normalization_19 (BatchNo | (None, None, None, 3 96 | | conv2d_19[0][0] |
| ----- | | | |
| batch_normalization_22 (BatchNo | (None, None, None, 4 144 | | conv2d_22[0][0] |
| ----- | | | |
| activation_19 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| activation_22 (Activation) | (None, None, None, 4 0 | | batch_normalization_2 |
| ----- | | | |
| conv2d_18 (Conv2D) | (None, None, None, 3 10240 | | block35_1_ac[0][0] |
| ----- | | | |
| conv2d_20 (Conv2D) | (None, None, None, 3 9216 | | activation_19[0][0] |
| ----- | | | |
| conv2d_23 (Conv2D) | (None, None, None, 6 27648 | | activation_22[0][0] |
| ----- | | | |
| batch_normalization_18 (BatchNo | (None, None, None, 3 96 | | conv2d_18[0][0] |
| ----- | | | |
| batch_normalization_20 (BatchNo | (None, None, None, 3 96 | | conv2d_20[0][0] |
| ----- | | | |
| batch_normalization_23 (BatchNo | (None, None, None, 6 192 | | conv2d_23[0][0] |
| ----- | | | |
| activation_18 (Activation) | (None, None, None, 3 0 | | batch_normalization_1 |
| ----- | | | |
| activation_20 (Activation) | (None, None, None, 3 0 | | batch_normalization_2 |
| ----- | | | |
| activation_23 (Activation) | (None, None, None, 6 0 | | batch_normalization_2 |
| ----- | | | |
| block35_2_mixed (Concatenate) | (None, None, None, 1 0 | | activation_18[0][0] |
| ----- | | | |
| | | | activation_20[0][0] |
| ----- | | | |
| | | | activation_23[0][0] |
| ----- | | | |
| block35_2_conv (Conv2D) | (None, None, None, 3 41280 | | block35_2_mixed[0][0] |
| ----- | | | |
| block35_2 (Lambda) | (None, None, None, 3 0 | | block35_1_ac[0][0] |
| ----- | | | |
| block35_2_ac (Activation) | (None, None, None, 3 0 | | block35_2_conv[0][0] |
| ----- | | | |
| conv2d_24 (Conv2D) | (None, None, None, 3 10240 | | block35_2_ac[0][0] |
| ----- | | | |
| batch_normalization_27 (BatchNo | (None, None, None, 3 96 | | conv2d_27[0][0] |
| ----- | | | |
| activation_27 (Activation) | (None, None, None, 3 0 | | batch_normalization_2 |
| ----- | | | |
| conv2d_25 (Conv2D) | (None, None, None, 3 10240 | | block35_2_ac[0][0] |
| ----- | | | |
| conv2d_28 (Conv2D) | (None, None, None, 4 13824 | | activation_27[0][0] |
| ----- | | | |
| batch_normalization_25 (BatchNo | (None, None, None, 3 96 | | conv2d_25[0][0] |
| ----- | | | |
| batch_normalization_28 (BatchNo | (None, None, None, 4 144 | | conv2d_28[0][0] |
| ----- | | | |
| activation_25 (Activation) | (None, None, None, 3 0 | | batch_normalization_2 |
| ----- | | | |
| activation_28 (Activation) | (None, None, None, 4 0 | | batch_normalization_2 |
| ----- | | | |
| conv2d_24 (Conv2D) | (None, None, None, 3 10240 | | block35_2_ac[0][0] |
| ----- | | | |
| conv2d_26 (Conv2D) | (None, None, None, 3 9216 | | activation_25[0][0] |
| ----- | | | |
| conv2d_29 (Conv2D) | (None, None, None, 6 27648 | | activation_28[0][0] |
| ----- | | | |
| batch_normalization_24 (BatchNo | (None, None, None, 3 96 | | conv2d_24[0][0] |
| ----- | | | |
| batch_normalization_26 (BatchNo | (None, None, None, 3 96 | | conv2d_26[0][0] |
| ----- | | | |
| batch_normalization_29 (BatchNo | (None, None, None, 6 192 | | conv2d_29[0][0] |
| ----- | | | |
| activation_24 (Activation) | (None, None, None, 3 0 | | batch_normalization_2 |
| ----- | | | |
| activation_26 (Activation) | (None, None, None, 3 0 | | batch_normalization_2 |
| ----- | | | |
| activation_29 (Activation) | (None, None, None, 6 0 | | batch_normalization_2 |
| ----- | | | |
| block35_3_mixed (Concatenate) | (None, None, None, 1 0 | | activation_24[0][0] |
| ----- | | | |
| | | | activation_26[0][0] |
| ----- | | | |
| | | | activation_29[0][0] |
| ----- | | | |
| block35_3_conv (Conv2D) | (None, None, None, 3 41280 | | block35_3_mixed[0][0] |
| ----- | | | |
| block35_3 (Lambda) | (None, None, None, 3 0 | | block35_2_ac[0][0] |
| ----- | | | |
| block35_3_ac (Activation) | (None, None, None, 3 0 | | block35_3_conv[0][0] |
| ----- | | | |
| conv2d_33 (Conv2D) | (None, None, None, 3 10240 | | block35_3_ac[0][0] |
| ----- | | | |
| batch_normalization_33 (BatchNo | (None, None, None, 3 96 | | conv2d_33[0][0] |
| ----- | | | |
| activation_33 (Activation) | (None, None, None, 3 0 | | batch_normalization_3 |
| ----- | | | |
| conv2d_31 (Conv2D) | (None, None, None, 3 10240 | | block35_3_ac[0][0] |
| ----- | | | |
| conv2d_34 (Conv2D) | (None, None, None, 4 13824 | | activation_33[0][0] |
| ----- | | | |
| batch_normalization_31 (BatchNo | (None, None, None, 3 96 | | conv2d_31[0][0] |
| ----- | | | |
| batch_normalization_34 (BatchNo | (None, None, None, 4 144 | | conv2d_34[0][0] |
| ----- | | | |
| activation_31 (Activation) | (None, None, None, 3 0 | | batch_normalization_3 |
| ----- | | | |
| activation_34 (Activation) | (None, None, None, 4 0 | | batch_normalization_3 |
| | | | |

| | | |
|---------------------------------|------------------------------|---|
| 4[0][0] | | |
| activation_56 (Activation) | (None, None, None, 3 0 | batch_normalization_56[0][0] |
| activation_59 (Activation) | (None, None, None, 6 0 | batch_normalization_59[0][0] |
| block35_8_mixed (Concatenate) | (None, None, None, 1 0 | activation_54[0][0] activation_56[0][0] activation_59[0][0] |
| block35_8_conv (Conv2D) | (None, None, None, 3 41280 | block35_8_mixed[0][0] |
| block35_8 (Lambda) | (None, None, None, 3 0 | block35_7_ac[0][0] block35_8_conv[0][0] |
| block35_8_ac (Activation) | (None, None, None, 3 0 | block35_8[0][0] |
| conv2d_63 (Conv2D) | (None, None, None, 3 10240 | block35_8_ac[0][0] |
| batch_normalization_63 (BatchNo | (None, None, None, 3 96 | conv2d_63[0][0] |
| activation_63 (Activation) | (None, None, None, 3 0 | batch_normalization_63[0][0] |
| conv2d_61 (Conv2D) | (None, None, None, 3 10240 | block35_8_ac[0][0] |
| conv2d_64 (Conv2D) | (None, None, None, 4 13824 | activation_63[0][0] |
| batch_normalization_61 (BatchNo | (None, None, None, 3 96 | conv2d_61[0][0] |
| batch_normalization_64 (BatchNo | (None, None, None, 4 144 | conv2d_64[0][0] |
| activation_61 (Activation) | (None, None, None, 3 0 | batch_normalization_61[0][0] |
| activation_64 (Activation) | (None, None, None, 4 0 | batch_normalization_64[0][0] |
| conv2d_60 (Conv2D) | (None, None, None, 3 10240 | block35_8_ac[0][0] |
| conv2d_62 (Conv2D) | (None, None, None, 3 9216 | activation_61[0][0] |
| conv2d_65 (Conv2D) | (None, None, None, 6 27648 | activation_64[0][0] |
| batch_normalization_60 (BatchNo | (None, None, None, 3 96 | conv2d_60[0][0] |
| batch_normalization_62 (BatchNo | (None, None, None, 3 96 | conv2d_62[0][0] |
| batch_normalization_65 (BatchNo | (None, None, None, 6 192 | conv2d_65[0][0] |
| activation_60 (Activation) | (None, None, None, 3 0 | batch_normalization_60[0][0] |
| activation_62 (Activation) | (None, None, None, 3 0 | batch_normalization_62[0][0] |
| activation_65 (Activation) | (None, None, None, 6 0 | batch_normalization_65[0][0] |
| block35_9_mixed (Concatenate) | (None, None, None, 1 0 | activation_60[0][0] activation_62[0][0] activation_65[0][0] |
| block35_9_conv (Conv2D) | (None, None, None, 3 41280 | block35_9_mixed[0][0] |
| block35_9 (Lambda) | (None, None, None, 3 0 | block35_8_ac[0][0] block35_9_conv[0][0] |
| block35_9_ac (Activation) | (None, None, None, 3 0 | block35_9[0][0] |
| conv2d_69 (Conv2D) | (None, None, None, 3 10240 | block35_9_ac[0][0] |
| batch_normalization_69 (BatchNo | (None, None, None, 3 96 | conv2d_69[0][0] |
| activation_69 (Activation) | (None, None, None, 3 0 | batch_normalization_69[0][0] |
| conv2d_67 (Conv2D) | (None, None, None, 3 10240 | block35_9_ac[0][0] |
| conv2d_70 (Conv2D) | (None, None, None, 4 13824 | activation_69[0][0] |
| batch_normalization_67 (BatchNo | (None, None, None, 3 96 | conv2d_67[0][0] |
| batch_normalization_70 (BatchNo | (None, None, None, 4 144 | conv2d_70[0][0] |
| activation_67 (Activation) | (None, None, None, 3 0 | batch_normalization_67[0][0] |
| activation_70 (Activation) | (None, None, None, 4 0 | batch_normalization_70[0][0] |
| conv2d_66 (Conv2D) | (None, None, None, 3 10240 | block35_9_ac[0][0] |
| conv2d_68 (Conv2D) | (None, None, None, 3 9216 | activation_67[0][0] |
| conv2d_71 (Conv2D) | (None, None, None, 6 27648 | activation_70[0][0] |
| batch_normalization_66 (BatchNo | (None, None, None, 3 96 | conv2d_66[0][0] |
| batch_normalization_68 (BatchNo | (None, None, None, 3 96 | conv2d_68[0][0] |
| batch_normalization_71 (BatchNo | (None, None, None, 6 192 | conv2d_71[0][0] |
| activation_66 (Activation) | (None, None, None, 3 0 | batch_normalization_66[0][0] |
| activation_68 (Activation) | (None, None, None, 3 0 | batch_normalization_68[0][0] |
| activation_71 (Activation) | (None, None, None, 6 0 | batch_normalization_71[0][0] |
| block35_10_mixed (Concatenate) | (None, None, None, 1 0 | activation_66[0][0] activation_68[0][0] activation_71[0][0] |
| block35_10_conv (Conv2D) | (None, None, None, 3 41280 | block35_10_mixed[0] |
| block35_10 (Lambda) | (None, None, None, 3 0 | block35_9_ac[0][0] block35_10_conv[0][0] |
| block35_10_ac (Activation) | (None, None, None, 3 0 | block35_10[0][0] |
| conv2d_73 (Conv2D) | (None, None, None, 2 81920 | block35_10_ac[0][0] |
| batch_normalization_73 (BatchNo | (None, None, None, 2 768 | conv2d_73[0][0] |
| activation_73 (Activation) | (None, None, None, 2 0 | batch_normalization_73[0][0] |
| conv2d_74 (Conv2D) | (None, None, None, 2 589824 | activation_73[0][0] |
| batch_normalization_74 (BatchNo | (None, None, None, 2 768 | conv2d_74[0][0] |
| activation_74 (Activation) | (None, None, None, 2 0 | batch_normalization_74[0][0] |
| conv2d_72 (Conv2D) | (None, None, None, 3 1105920 | block35_10_ac[0][0] |
| conv2d_75 (Conv2D) | (None, None, None, 3 884736 | activation_74[0][0] |
| batch_normalization_72 (BatchNo | (None, None, None, 3 1152 | conv2d_72[0][0] |
| batch_normalization_75 (BatchNo | (None, None, None, 3 1152 | conv2d_75[0][0] |
| activation_72 (Activation) | (None, None, None, 3 0 | batch_normalization_72[0][0] |
| activation_75 (Activation) | (None, None, None, 3 0 | batch_normalization_75[0][0] |
| max_pooling2d_2 (MaxPooling2D) | (None, None, None, 3 0 | block35_10_ac[0][0] |
| mixed_6a (Concatenate) | (None, None, None, 1 0 | activation_72[0][0] activation_75[0][0] max_pooling2d_2[0][0] |
| conv2d_77 (Conv2D) | (None, None, None, 1 139264 | mixed_6a[0][0] |
| batch_normalization_77 (BatchNo | (None, None, None, 1 384 | conv2d_77[0][0] |
| activation_77 (Activation) | (None, None, None, 1 0 | batch_normalization_77[0][0] |
| conv2d_78 (Conv2D) | (None, None, None, 1 143360 | activation_77[0][0] |
| batch_normalization_78 (BatchNo | (None, None, None, 1 480 | conv2d_78[0][0] |
| activation_78 (Activation) | (None, None, None, 1 0 | batch_normalization_78[0][0] |
| conv2d_76 (Conv2D) | (None, None, None, 1 208896 | mixed_6a[0][0] |
| conv2d_79 (Conv2D) | (None, None, None, 1 215040 | activation_78[0][0] |
| batch_normalization_76 (BatchNo | (None, None, None, 1 576 | conv2d_76[0][0] |
| batch_normalization_79 (BatchNo | (None, None, None, 1 576 | conv2d_79[0][0] |
| activation_76 (Activation) | (None, None, None, 1 0 | batch_normalization_76[0][0] |
| activation_79 (Activation) | (None, None, None, 1 0 | batch_normalization_79[0][0] |
| block17_1_mixed (Concatenate) | (None, None, None, 3 0 | activation_76[0][0] activation_79[0][0] |
| block17_1_conv (Conv2D) | (None, None, None, 1 418880 | block17_1_mixed[0][0] |
| block17_1 (Lambda) | (None, None, None, 1 0 | mixed_6a[0][0] block17_1_conv[0][0] |
| block17_1_ac (Activation) | (None, None, None, 1 0 | block17_1[0][0] |
| conv2d_81 (Conv2D) | (None, None, None, 1 139264 | block17_1_ac[0][0] |
| batch_normalization_81 (BatchNo | (None, None, None, 1 384 | conv2d_81[0][0] |
| activation_81 (Activation) | (None, None, None, 1 0 | batch_normalization_81[0][0] |
| conv2d_82 (Conv2D) | (None, None, None, 1 143360 | activation_81[0][0] |
| batch_normalization_82 (BatchNo | (None, None, None, 1 480 | conv2d_82[0][0] |
| activation_82 (Activation) | (None, None, None, 1 0 | batch_normalization_82[0][0] |
| conv2d_80 (Conv2D) | (None, None, None, 1 208896 | block17_1_ac[0][0] |
| conv2d_83 (Conv2D) | (None, None, None, 1 215040 | activation_82[0][0] |
| batch_normalization_80 (BatchNo | (None, None, None, 1 576 | conv2d_80[0][0] |
| batch_normalization_83 (BatchNo | (None, None, None, 1 576 | conv2d_83[0][0] |
| activation_80 (Activation) | (None, None, None, 1 0 | batch_normalization_80[0][0] |
| activation_83 (Activation) | (None, None, None, 1 0 | batch_normalization_83[0][0] |
| block17_2_mixed (Concatenate) | (None, None, None, 3 0 | activation_80[0][0] activation_83[0][0] |
| block17_2_conv (Conv2D) | (None, None, None, 1 418880 | block17_2_mixed[0][0] |
| block17_2 (Lambda) | (None, None, None, 1 0 | block17_1_ac[0][0] block17_2_conv[0][0] |
| block17_2_ac (Activation) | (None, None, None, 1 0 | block17_2[0][0] |
| conv2d_85 (Conv2D) | (None, None, None, 1 139264 | block17_2_ac[0][0] |
| batch_normalization_85 (BatchNo | (None, None, None, 1 384 | conv2d_85[0][0] |
| activation_85 (Activation) | (None, None, None, 1 0 | batch_normalization_85[0][0] |
| conv2d_86 (Conv2D) | (None, None, None, 1 143360 | activation_85[0][0] |
| batch_normalization_86 (BatchNo | (None, None, None, 1 480 | conv2d_86[0][0] |
| activation_86 (Activation) | (None, None, None, 1 0 | batch_normalization_86[0][0] |
| conv2d_84 (Conv2D) | (None, None, None, 1 208896 | block17_2_ac[0][0] |
| conv2d_87 (Conv2D) | (None, None, None, 1 215040 | activation_86[0][0] |
| batch_normalization_84 (BatchNo | (None, None, None, 1 576 | conv2d_84[0][0] |
| batch_normalization_87 (BatchNo | (None, None, None, 1 576 | conv2d_87[0][0] |
| activation_84 (Activation) | (None, None, None, 1 0 | batch_normalization_84[0][0] |
| activation_87 (Activation) | (None, None, None, 1 0 | batch_normalization_87[0][0] |
| block17_3_mixed (Concatenate) | (None, None, None, 3 0 | activation_84[0][0] activation_87[0][0] |
| block17_3_conv (Conv2D) | (None, None, None, 1 418880 | block17_3_mixed[0][0] |
| block17_3 (Lambda) | (None, None, None, 1 0 | block17_2_ac[0][0] block17_3_conv[0][0] |
| block17_3_ac (Activation) | (None, None, None, 1 0 | block17_3[0][0] |
| conv2d_89 (Conv2D) | (None, None, None, 1 139264 | block17_3_ac[0][0] |
| batch_normalization_89 (BatchNo | (None, None, None, 1 384 | conv2d_89[0][0] |
| activation_89 (Activation) | (None, None, None, 1 0 | batch_normalization_89[0][0] |
| conv2d_90 (Conv2D) | (None, None, None, 1 143360 | activation_89[0][0] |
| batch_normalization_90 (BatchNo | (None, None, None, 1 480 | conv2d_90[0][0] |
| activation_90 (Activation) | (None, None, None, 1 0 | batch_normalization_90[0][0] |
| conv2d_88 (Conv2D) | (None, None, None, 1 208896 | block17_3_ac[0][0] |
| conv2d_91 (Conv2D) | (None, None, None, 1 215040 | activation_90[0][0] |
| batch_normalization_88 (BatchNo | (None, None, None, 1 576 | conv2d_88[0][0] |
| batch_normalization_91 (BatchNo | (None, None, None, 1 576 | conv2d_91[0][0] |
| activation_88 (Activation) | (None, None, None, 1 0 | batch_normalization_88[0][0] |
| activation_91 (Activation) | (None, None, None, 1 0 | batch_normalization_91[0][0] |
| block17_4_mixed (Concatenate) | (None, None, None, 3 0 | activation_88[0][0] activation_91[0][0] |
| block17_4_conv (Conv2D) | (None, None, None, 1 418880 | block17_4_mixed[0][0] |
| block17_4 (Lambda) | (None, None, None, 1 0 | block17_3_ac[0][0] block17_4_conv[0][0] |
| block17_4_ac (Activation) | (None, None, None, 1 0 | block17_4[0][0] |
| conv2d_93 (Conv2D) | (None, None, None, 1 139264 | block17_4_ac[0][0] |
| batch_normalization_93 (BatchNo | (None, None, None, 1 384 | conv2d_93[0][0] |
| activation_93 (Activation) | (None, None, None, 1 0 | batch_normalization_93[0][0] |
| conv2d_94 (Conv2D) | (None, None, None, 1 143360 | activation_93[0][0] |
| batch_normalization_94 (BatchNo | (None, None, None, 1 480 | conv2d_94[0][0] |
| activation_94 (Activation) | (None, None, None, 1 0 | batch_normalization_94[0][0] |
| conv2d_92 (Conv2D) | (None, None, None, 1 208896 | block17_4_ac[0][0] |
| conv2d_95 (Conv2D) | (None, None, None, 1 215040 | activation_94[0][0] |
| batch_normalization_92 (BatchNo | (None, None, None, 1 576 | conv2d_92[0][0] |
| batch_normalization_95 (BatchNo | (None, None, None, 1 576 | conv2d_95[0][0] |
| activation_92 (Activation) | (None, None, None, 1 0 | batch_normalization_92[0][0] |
| activation_95 (Activation) | (None, None, None, 1 0 | batch_normalization_95[0][0] |
| block17_5_mixed (Concatenate) | (None, None, None, 3 0 | activation_92[0][0] activation_95[0][0] |
| block17_5_conv (Conv2D) | (None, None, None, 1 418880 | block17_5_mixed[0][0] |
| block17_5 (Lambda) | (None, None, None, 1 0 | block17_4_ac[0][0] block17_5_conv[0][0] |
| block17_5_ac (Activation) | (None, None, None, 1 0 | block17_5[0][0] |
| conv2d_97 (Conv2D) | (None, None, None, 1 139264 | block17_5_ac[0][0] |
| batch_normalization_97 (BatchNo | (None, None, None, 1 384 | conv2d_97[0][0] |
| activation_97 (Activation) | (None, None, None, 1 0 | batch_normalization_97[0][0] |
| conv2d_98 (Conv2D) | (None, None, None, 1 143360 | activation_97[0][0] |
| batch_normalization_98 (BatchNo | (None, None, None, 1 480 | conv2d_98[0][0] |
| activation_98 (Activation) | (None, None, None, 1 0 | batch_normalization_98[0][0] |
| conv2d_96 (Conv2D) | (None, None, None, 1 208896 | block17_5_ac[0][0] |
| conv2d_99 (Conv2D) | (None, None, None, 1 215040 | activation_98[0][0] |
| batch_normalization_96 (BatchNo | (None, None, None, 1 576 | conv2d_96[0][0] |
| batch_normalization_99 (BatchNo | (None, None, None, 1 576 | conv2d_99[0][0] |
| activation_96 (Activation) | (None, None, None, 1 0 | batch_normalization_96[0][0] |
| activation_99 (Activation) | (None, None, None, 1 0 | batch_normalization_99[0][0] |
| block17_6_mixed (Concatenate) | (None, None, None, 3 0 | activation_96[0][0] activation_99[0][0] |
| block17_6_conv (Conv2D) | (None, None, None, 1 418880 | block17_6_mixed[0][0] |
| block17_6 (Lambda) | (None, None, None, 1 0 | block17_5_ac[0][0] block17_6_conv[0][0] |
| block17_6_ac (Activation) | (None, None, None, 1 0 | block17_6[0][0] |
| conv2d_101 (Conv2D) | (None, None, None, 1 139264 | block17_6_ac[0][0] |
| batch_normalization_101 (BatchN | (None, None, None, 1 384 | conv2d_101[0][0] |
| activation_101 (Activation) | (None, None, None, 1 0 | batch_normalization_101[0][0] |
| conv2d_102 (Conv2D) | (None, None, None, 1 143360 | activation_101[0][0] |
| batch_normalization_102 (BatchN | (None, None, None, 1 480 | conv2d_102[0][0] |
| activation_102 (Activation) | (None, None, None, 1 0 | batch_normalization_102[0][0] |
| conv2d_100 (Conv2D) | (None, None, None, 1 208896 | block17_6_ac[0][0] |
| conv2d_103 (Conv2D) | (None, None, None, 1 215040 | activation_102[0][0] |
| batch_normalization_100 (BatchN | (None, None, None, 1 576 | conv2d_100[0][0] |
| batch_normalization_103 (BatchN | (None, None, None, 1 576 | conv2d_103[0][0] |
| activation_100 (Activation) | (None, None, None, 1 0 | batch_normalization_100[0][0] |
| activation_103 (Activation) | (None, None, None, 1 0 | batch_normalization_103[0][0] |
| block17_7_mixed (Concatenate) | (None, None, None, 3 0 | activation_100[0][0] activation_103[0][0] |
| block17_7_conv (Conv2D) | (None, None, None, 1 418880 | block17_7_mixed[0][0] |
| block17_7 (Lambda) | (None, None, None, 1 0 | block17_6_ac[0][0] block17_7_conv[0][0] |
| block17_7_ac (Activation) | (None, None, None, 1 0 | block17_7[0][0] |
| conv2d_105 (Conv2D) | (None, None, None, 1 139264 | block17_7_ac[0][0] |
| batch_normalization_105 (BatchN | (None, None, None, 1 384 | conv2d_105[0][0] |
| activation_105 (Activation) | (None, None, None, 1 0 | batch_normalization_105[0][0] |
| conv2d_106 (Conv2D) | (None, None, None, 1 143360 | activation_105[0][0] |
| batch_normalization_106 (BatchN | (None, None, None, 1 480 | conv2d_106[0][0] |
| activation_106 (Activation) | (None, None, None, 1 0 | batch_normalization_106[0][0] |
| conv2d_104 (Conv2D) | (None, None, None, 1 208896 | block17_7_ac[0][0] |
| conv2d_107 (Conv2D) | (None, None, None, 1 215040 | activation_106[0][0] |
| batch_normalization_104 (BatchN | (None, None, None, 1 576 | conv2d_104[0][0] |
| batch_normalization_107 (BatchN | (None, None, None, 1 576 | conv2d_107[0][0] |
| activation_104 (Activation) | (None, None, None, 1 0 | batch_normalization_104[0][0] |
| activation_107 (Activation) | (None, None, None, 1 0 | batch_normalization_107[0][0] |
| block17_8_mixed (Concatenate) | (None, None, None, 3 0 | activation_104[0][0] activation_107[0][0] |
| block17_8_conv (Conv2D) | (None, None, None, 1 418880 | block17_8_mixed[0][0] |
| block17_8 (Lambda) | (None, None, None, 1 0 | block17_7_ac[0][0] block17_8_conv[0][0] |
| block17_8_ac (Activation) | (None, None, None, 1 0 | block17_8[0][0] |
| conv2d_109 (Conv2D) | (None, None, None, 1 139264 | block17_8_ac[0][0] |
| batch_normalization_109 (BatchN | (None, None, None, 1 384 | conv2d_109[0][0] |
| activation_109 (Activation) | (None, None, None, 1 0 | batch_normalization_109[0][0] |
| conv2d_110 (Conv2D) | (None, None, None, 1 143360 | activation_109[0][0] |
| batch_normalization_110 (BatchN | (None, None, None, 1 480 | conv2d_110[0][0] |
| activation_110 (Activation) | (None, None, None, 1 0 | batch_normalization_110[0][0] |
| conv2d_108 (Conv2D) | (None, None, None, 1 208896 | block17_8_ac[0][0] |
| conv2d_111 (Conv2D) | (None, None, None, 1 215040 | activation_110[0][0] |
| batch_normalization_108 (BatchN | (None, None, None, 1 576 | conv2d_108[0][0] |
| batch_normalization_111 (BatchN | (None, None, None, 1 576 | conv2d_111[0][0] |
| activation_108 (Activation) | (None, None, None, 1 0 | batch_normalization_108[0][0] |
| activation_111 (Activation) | (None, None, None, 1 0 | batch_normalization_111[0][0] |
| block17_9_mixed (Concatenate) | (None, None, None, 3 0 | activation_108[0][0] activation_111[0][0] |
| block17_9_conv (Conv2D) | (None, None, None, 1 418880 | block17_9_mixed[0][0] |
| block17_9 (Lambda) | (None, None, None, 1 0 | block17_8_ac[0][0] block17_9_conv[0][0] |
| block17_9_ac (Activation) | (None, None, None, 1 0 | block17_9[0][0] |
| conv2d_113 (Conv2D) | (None, None, None, 1 139264 | block17_9_ac[0][0] |
| batch_normalization_113 (BatchN | (None, None, None, 1 384 | conv2d_113[0][0] |
| activation_113 (Activation) | (None, None, None, 1 0 | batch_normalization_113[0][0] |
| conv2d_114 (Conv2D) | (None, None, None, 1 143360 | activation_113[0][0] |
| batch_normalization_114 (BatchN | (None, None, None, 1 480 | conv2d_114[0][0] |
| activation_114 (Activation) | (None, None, None, 1 0 | batch_normalization_114[0][0] |
| conv2d_112 (Conv2D) | (None, None, None, 1 208896 | block17_9_ac[0][0] |
| conv2d_115 (Conv2D) | (None, None, None, 1 215040 | activation_114[0][0] |
| batch_normalization_112 (BatchN | (None, None, None, 1 576 | conv2d_112[0][0] |
| batch_normalization_115 (BatchN | (None, None, None, 1 576 | conv2d_115[0][0] |
| activation_112 (Activation) | (None, None, None, 1 0 | batch_normalization_112[0][0] |
| activation_115 (Activation) | (None, None, None, 1 0 | batch_normalization_115[0][0] |
| block17_10_mixed (Concatenate) | (None, None, None, 3 0 | activation_112[0][0] activation_115[0][0] |
| block17_10_conv (Conv2D) | (None, None, None, 1 418880 | block17_10_mixed[0] |
| block17_10 (Lambda) | (None, None, None, 1 0 | block17_9_ac[0][0] block17_10_conv[0][0] |
| block17_10_ac (Activation) | (None, None, None, 1 0 | block17_10[0][0] |

| | | |
|--------------------------------------|-----------------------------|-----------------------|
| conv2d_117 (Conv2D) | (None, None, None, 1 139264 | block17_10_ac[0][0] |
| batch_normalization_117 (BatchN | (None, None, None, 1 384 | conv2d_117[0][0] |
| activation_117 (Activation) 17[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_118 (Conv2D) | (None, None, None, 1 143360 | activation_117[0][0] |
| batch_normalization_118 (BatchN | (None, None, None, 1 480 | conv2d_118[0][0] |
| activation_118 (Activation) 18[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_116 (Conv2D) | (None, None, None, 1 208896 | block17_10_ac[0][0] |
| conv2d_119 (Conv2D) | (None, None, None, 1 215040 | activation_118[0][0] |
| batch_normalization_116 (BatchN | (None, None, None, 1 576 | conv2d_116[0][0] |
| batch_normalization_119 (BatchN | (None, None, None, 1 576 | conv2d_119[0][0] |
| activation_116 (Activation) 16[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_119 (Activation) 19[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_l1_mixed (Concatenate) | (None, None, None, 3 0 | activation_116[0][0] |
| | | activation_119[0][0] |
| block17_l1_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_l1_mixed[0] |
| block17_l1 (Lambda) | (None, None, None, 1 0 | block17_10_ac[0][0] |
| | | block17_l1_conv[0][0] |
| block17_l1_ac (Activation) | (None, None, None, 1 0 | block17_l1[0][0] |
| conv2d_121 (Conv2D) | (None, None, None, 1 139264 | block17_l1_ac[0][0] |
| batch_normalization_121 (BatchN | (None, None, None, 1 384 | conv2d_121[0][0] |
| activation_121 (Activation) 21[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_122 (Conv2D) | (None, None, None, 1 143360 | activation_121[0][0] |
| batch_normalization_122 (BatchN | (None, None, None, 1 480 | conv2d_122[0][0] |
| activation_122 (Activation) 22[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_120 (Conv2D) | (None, None, None, 1 208896 | block17_l1_ac[0][0] |
| conv2d_123 (Conv2D) | (None, None, None, 1 215040 | activation_122[0][0] |
| batch_normalization_120 (BatchN | (None, None, None, 1 576 | conv2d_120[0][0] |
| batch_normalization_123 (BatchN | (None, None, None, 1 576 | conv2d_123[0][0] |
| activation_120 (Activation) 20[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_123 (Activation) 23[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_12_mixed (Concatenate) | (None, None, None, 3 0 | activation_120[0][0] |
| | | activation_123[0][0] |
| block17_12_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_12_mixed[0] |
| block17_12 (Lambda) | (None, None, None, 1 0 | block17_l1_ac[0][0] |
| | | block17_12_conv[0][0] |
| block17_12_ac (Activation) | (None, None, None, 1 0 | block17_12[0][0] |
| conv2d_125 (Conv2D) | (None, None, None, 1 139264 | block17_12_ac[0][0] |
| batch_normalization_125 (BatchN | (None, None, None, 1 384 | conv2d_125[0][0] |
| activation_125 (Activation) 25[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_126 (Conv2D) | (None, None, None, 1 143360 | activation_125[0][0] |
| batch_normalization_126 (BatchN | (None, None, None, 1 480 | conv2d_126[0][0] |
| activation_126 (Activation) 26[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_124 (Conv2D) | (None, None, None, 1 208896 | block17_12_ac[0][0] |
| conv2d_127 (Conv2D) | (None, None, None, 1 215040 | activation_126[0][0] |
| batch_normalization_124 (BatchN | (None, None, None, 1 576 | conv2d_124[0][0] |
| batch_normalization_127 (BatchN | (None, None, None, 1 576 | conv2d_127[0][0] |
| activation_124 (Activation) 24[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_127 (Activation) 27[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_13_mixed (Concatenate) | (None, None, None, 3 0 | activation_124[0][0] |
| | | activation_127[0][0] |
| block17_13_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_13_mixed[0] |
| block17_13 (Lambda) | (None, None, None, 1 0 | block17_12_ac[0][0] |
| | | block17_13_conv[0][0] |
| block17_13_ac (Activation) | (None, None, None, 1 0 | block17_13[0][0] |
| conv2d_129 (Conv2D) | (None, None, None, 1 139264 | block17_13_ac[0][0] |
| batch_normalization_129 (BatchN | (None, None, None, 1 384 | conv2d_129[0][0] |
| activation_129 (Activation) 29[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_130 (Conv2D) | (None, None, None, 1 143360 | activation_129[0][0] |
| batch_normalization_130 (BatchN | (None, None, None, 1 480 | conv2d_130[0][0] |
| activation_130 (Activation) 30[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_128 (Conv2D) | (None, None, None, 1 208896 | block17_13_ac[0][0] |
| conv2d_131 (Conv2D) | (None, None, None, 1 215040 | activation_130[0][0] |
| batch_normalization_128 (BatchN | (None, None, None, 1 576 | conv2d_128[0][0] |
| batch_normalization_131 (BatchN | (None, None, None, 1 576 | conv2d_131[0][0] |
| activation_128 (Activation) 28[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_131 (Activation) 31[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_14_mixed (Concatenate) | (None, None, None, 3 0 | activation_128[0][0] |
| | | activation_131[0][0] |
| block17_14_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_14_mixed[0] |
| block17_14 (Lambda) | (None, None, None, 1 0 | block17_13_ac[0][0] |
| | | block17_14_conv[0][0] |
| block17_14_ac (Activation) | (None, None, None, 1 0 | block17_14[0][0] |
| conv2d_133 (Conv2D) | (None, None, None, 1 139264 | block17_14_ac[0][0] |
| batch_normalization_133 (BatchN | (None, None, None, 1 384 | conv2d_133[0][0] |
| activation_133 (Activation) 33[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_134 (Conv2D) | (None, None, None, 1 143360 | activation_133[0][0] |
| batch_normalization_134 (BatchN | (None, None, None, 1 480 | conv2d_134[0][0] |
| activation_134 (Activation) 34[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_132 (Conv2D) | (None, None, None, 1 208896 | block17_14_ac[0][0] |
| conv2d_135 (Conv2D) | (None, None, None, 1 215040 | activation_134[0][0] |
| batch_normalization_132 (BatchN | (None, None, None, 1 576 | conv2d_132[0][0] |
| batch_normalization_135 (BatchN | (None, None, None, 1 576 | conv2d_135[0][0] |
| activation_132 (Activation) 32[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_135 (Activation) 35[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_15_mixed (Concatenate) | (None, None, None, 3 0 | activation_132[0][0] |
| | | activation_135[0][0] |
| block17_15_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_15_mixed[0] |
| block17_15 (Lambda) | (None, None, None, 1 0 | block17_14_ac[0][0] |
| | | block17_15_conv[0][0] |
| block17_15_ac (Activation) | (None, None, None, 1 0 | block17_15[0][0] |
| conv2d_137 (Conv2D) | (None, None, None, 1 139264 | block17_15_ac[0][0] |
| batch_normalization_137 (BatchN | (None, None, None, 1 384 | conv2d_137[0][0] |
| activation_137 (Activation) 37[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_138 (Conv2D) | (None, None, None, 1 143360 | activation_137[0][0] |
| batch_normalization_138 (BatchN | (None, None, None, 1 480 | conv2d_138[0][0] |
| activation_138 (Activation) 38[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_136 (Conv2D) | (None, None, None, 1 208896 | block17_15_ac[0][0] |
| conv2d_139 (Conv2D) | (None, None, None, 1 215040 | activation_138[0][0] |
| batch_normalization_136 (BatchN | (None, None, None, 1 576 | conv2d_136[0][0] |
| batch_normalization_139 (BatchN | (None, None, None, 1 576 | conv2d_139[0][0] |
| activation_136 (Activation) 36[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_139 (Activation) 39[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_16_mixed (Concatenate) | (None, None, None, 3 0 | activation_136[0][0] |
| | | activation_139[0][0] |
| block17_16_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_16_mixed[0] |
| block17_16 (Lambda) | (None, None, None, 1 0 | block17_15_ac[0][0] |
| | | block17_16_conv[0][0] |
| block17_16_ac (Activation) | (None, None, None, 1 0 | block17_16[0][0] |
| conv2d_141 (Conv2D) | (None, None, None, 1 139264 | block17_16_ac[0][0] |
| batch_normalization_141 (BatchN | (None, None, None, 1 384 | conv2d_141[0][0] |
| activation_141 (Activation) 41[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_142 (Conv2D) | (None, None, None, 1 143360 | activation_141[0][0] |
| batch_normalization_142 (BatchN | (None, None, None, 1 480 | conv2d_142[0][0] |
| activation_142 (Activation) 42[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_140 (Conv2D) | (None, None, None, 1 208896 | block17_16_ac[0][0] |
| conv2d_143 (Conv2D) | (None, None, None, 1 215040 | activation_142[0][0] |
| batch_normalization_140 (BatchN | (None, None, None, 1 576 | conv2d_140[0][0] |
| batch_normalization_143 (BatchN | (None, None, None, 1 576 | conv2d_143[0][0] |
| activation_140 (Activation) 40[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_143 (Activation) 43[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_17_mixed (Concatenate) | (None, None, None, 3 0 | activation_140[0][0] |
| | | activation_143[0][0] |
| block17_17_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_17_mixed[0] |
| block17_17 (Lambda) | (None, None, None, 1 0 | block17_16_ac[0][0] |
| | | block17_17_conv[0][0] |
| block17_17_ac (Activation) | (None, None, None, 1 0 | block17_17[0][0] |
| conv2d_145 (Conv2D) | (None, None, None, 1 139264 | block17_17_ac[0][0] |
| batch_normalization_145 (BatchN | (None, None, None, 1 384 | conv2d_145[0][0] |
| activation_145 (Activation) 45[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_146 (Conv2D) | (None, None, None, 1 143360 | activation_145[0][0] |
| batch_normalization_146 (BatchN | (None, None, None, 1 480 | conv2d_146[0][0] |
| activation_146 (Activation) 46[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_144 (Conv2D) | (None, None, None, 1 208896 | block17_17_ac[0][0] |
| conv2d_147 (Conv2D) | (None, None, None, 1 215040 | activation_146[0][0] |
| batch_normalization_144 (BatchN | (None, None, None, 1 576 | conv2d_144[0][0] |
| batch_normalization_147 (BatchN | (None, None, None, 1 576 | conv2d_147[0][0] |
| activation_144 (Activation) 44[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_147 (Activation) 47[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_18_mixed (Concatenate) | (None, None, None, 3 0 | activation_144[0][0] |
| | | activation_147[0][0] |
| block17_18_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_18_mixed[0] |
| block17_18 (Lambda) | (None, None, None, 1 0 | block17_17_ac[0][0] |
| | | block17_18_conv[0][0] |
| block17_18_ac (Activation) | (None, None, None, 1 0 | block17_18[0][0] |
| conv2d_149 (Conv2D) | (None, None, None, 1 139264 | block17_18_ac[0][0] |
| batch_normalization_149 (BatchN | (None, None, None, 1 384 | conv2d_149[0][0] |
| activation_149 (Activation) 49[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_150 (Conv2D) | (None, None, None, 1 143360 | activation_149[0][0] |
| batch_normalization_150 (BatchN | (None, None, None, 1 480 | conv2d_150[0][0] |
| activation_150 (Activation) 50[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_148 (Conv2D) | (None, None, None, 1 208896 | block17_18_ac[0][0] |
| conv2d_151 (Conv2D) | (None, None, None, 1 215040 | activation_150[0][0] |
| batch_normalization_148 (BatchN | (None, None, None, 1 576 | conv2d_148[0][0] |
| batch_normalization_151 (BatchN | (None, None, None, 1 576 | conv2d_151[0][0] |
| activation_148 (Activation) 48[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_151 (Activation) 51[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_19_mixed (Concatenate) | (None, None, None, 3 0 | activation_148[0][0] |
| | | activation_151[0][0] |
| block17_19_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_19_mixed[0] |
| block17_19 (Lambda) | (None, None, None, 1 0 | block17_18_ac[0][0] |
| | | block17_19_conv[0][0] |
| block17_19_ac (Activation) | (None, None, None, 1 0 | block17_19[0][0] |
| conv2d_153 (Conv2D) | (None, None, None, 1 139264 | block17_19_ac[0][0] |
| batch_normalization_153 (BatchN | (None, None, None, 1 384 | conv2d_153[0][0] |
| activation_153 (Activation) 53[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_154 (Conv2D) | (None, None, None, 1 143360 | activation_153[0][0] |
| batch_normalization_154 (BatchN | (None, None, None, 1 480 | conv2d_154[0][0] |
| activation_154 (Activation) 54[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_152 (Conv2D) | (None, None, None, 1 208896 | block17_19_ac[0][0] |
| conv2d_155 (Conv2D) | (None, None, None, 1 215040 | activation_154[0][0] |
| batch_normalization_152 (BatchN | (None, None, None, 1 576 | conv2d_152[0][0] |
| batch_normalization_155 (BatchN | (None, None, None, 1 576 | conv2d_155[0][0] |
| activation_152 (Activation) 52[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_155 (Activation) 55[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| block17_20_mixed (Concatenate) | (None, None, None, 3 0 | activation_152[0][0] |
| | | activation_155[0][0] |
| block17_20_conv (Conv2D) [0] | (None, None, None, 1 418880 | block17_20_mixed[0] |
| block17_20 (Lambda) | (None, None, None, 1 0 | block17_19_ac[0][0] |
| | | block17_20_conv[0][0] |
| block17_20_ac (Activation) | (None, None, None, 1 0 | block17_20[0][0] |
| conv2d_160 (Conv2D) | (None, None, None, 2 278528 | block17_20_ac[0][0] |
| batch_normalization_160 (BatchN | (None, None, None, 2 768 | conv2d_160[0][0] |
| activation_160 (Activation) 60[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| conv2d_156 (Conv2D) | (None, None, None, 2 278528 | block17_20_ac[0][0] |
| conv2d_158 (Conv2D) | (None, None, None, 2 278528 | block17_20_ac[0][0] |
| conv2d_161 (Conv2D) | (None, None, None, 2 663552 | activation_160[0][0] |
| batch_normalization_156 (BatchN | (None, None, None, 2 768 | conv2d_156[0][0] |
| batch_normalization_158 (BatchN | (None, None, None, 2 768 | conv2d_158[0][0] |
| batch_normalization_161 (BatchN | (None, None, None, 2 864 | conv2d_161[0][0] |
| activation_156 (Activation) 56[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| activation_158 (Activation) 58[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| activation_161 (Activation) 61[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| conv2d_157 (Conv2D) | (None, None, None, 3 884736 | activation_156[0][0] |
| conv2d_159 (Conv2D) | (None, None, None, 2 663552 | activation_158[0][0] |
| conv2d_162 (Conv2D) | (None, None, None, 3 829440 | activation_161[0][0] |
| batch_normalization_157 (BatchN | (None, None, None, 3 1152 | conv2d_157[0][0] |
| batch_normalization_159 (BatchN | (None, None, None, 2 864 | conv2d_159[0][0] |
| batch_normalization_162 (BatchN | (None, None, None, 3 960 | conv2d_162[0][0] |
| activation_157 (Activation) 57[0][0] | (None, None, None, 3 0 | batch_normalization_1 |
| activation_159 (Activation) 59[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| activation_162 (Activation) 62[0][0] | (None, None, None, 3 0 | batch_normalization_1 |
| max_pooling2d_3 (MaxPooling2D) | (None, None, None, 1 0 | block17_20_ac[0][0] |
| mixed_7a (Concatenate) | (None, None, None, 2 0 | activation_157[0][0] |
| | | activation_159[0][0] |
| | | activation_162[0][0] |
| | | max_pooling2d_3[0][0] |
| conv2d_164 (Conv2D) | (None, None, None, 1 399360 | mixed_7a[0][0] |
| batch_normalization_164 (BatchN | (None, None, None, 1 576 | conv2d_164[0][0] |
| activation_164 (Activation) 64[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_165 (Conv2D) | (None, None, None, 2 129024 | activation_164[0][0] |
| batch_normalization_165 (BatchN | (None, None, None, 2 672 | conv2d_165[0][0] |
| activation_165 (Activation) 65[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| conv2d_163 (Conv2D) | (None, None, None, 1 399360 | mixed_7a[0][0] |
| conv2d_166 (Conv2D) | (None, None, None, 2 172032 | activation_165[0][0] |
| batch_normalization_163 (BatchN | (None, None, None, 1 576 | conv2d_163[0][0] |
| batch_normalization_166 (BatchN | (None, None, None, 2 768 | conv2d_166[0][0] |
| activation_163 (Activation) 63[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_166 (Activation) 66[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| block8_mixed (Concatenate) | (None, None, None, 4 0 | activation_163[0][0] |
| | | activation_166[0][0] |
| block8_1_conv (Conv2D) | (None, None, None, 2 933920 | block8_1_mixed[0][0] |
| block8_1 (Lambda) | (None, None, None, 2 0 | mixed_7a[0][0] |
| | | block8_1_conv[0][0] |
| block8_1_ac (Activation) | (None, None, None, 2 0 | block8_1[0][0] |
| conv2d_168 (Conv2D) | (None, None, None, 1 399360 | block8_1_ac[0][0] |
| batch_normalization_168 (BatchN | (None, None, None, 1 576 | conv2d_168[0][0] |
| activation_168 (Activation) 68[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_169 (Conv2D) | (None, None, None, 2 129024 | activation_168[0][0] |
| batch_normalization_169 (BatchN | (None, None, None, 2 672 | conv2d_169[0][0] |
| activation_169 (Activation) 69[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| conv2d_167 (Conv2D) | (None, None, None, 1 399360 | block8_1_ac[0][0] |
| conv2d_170 (Conv2D) | (None, None, None, 2 172032 | activation_169[0][0] |
| batch_normalization_167 (BatchN | (None, None, None, 1 576 | conv2d_167[0][0] |
| batch_normalization_170 (BatchN | (None, None, None, 2 768 | conv2d_170[0][0] |
| activation_167 (Activation) 67[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_170 (Activation) 70[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| block8_2_mixed (Concatenate) | (None, None, None, 4 0 | activation_167[0][0] |
| | | activation_170[0][0] |
| block8_2_conv (Conv2D) | (None, None, None, 2 933920 | block8_2_mixed[0][0] |
| block8_2 (Lambda) | (None, None, None, 2 0 | block8_1_ac[0][0] |
| | | block8_2_conv[0][0] |
| block8_2_ac (Activation) | (None, None, None, 2 0 | block8_2[0][0] |
| conv2d_172 (Conv2D) | (None, None, None, 1 399360 | block8_2_ac[0][0] |
| batch_normalization_172 (BatchN | (None, None, None, 1 576 | conv2d_172[0][0] |
| activation_172 (Activation) 72[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| conv2d_173 (Conv2D) | (None, None, None, 2 129024 | activation_172[0][0] |
| batch_normalization_173 (BatchN | (None, None, None, 2 672 | conv2d_173[0][0] |
| activation_173 (Activation) 73[0][0] | (None, None, None, 2 0 | batch_normalization_1 |
| conv2d_171 (Conv2D) | (None, None, None, 1 399360 | block8_2_ac[0][0] |
| conv2d_174 (Conv2D) | (None, None, None, 2 172032 | activation_173[0][0] |
| batch_normalization_171 (BatchN | (None, None, None, 1 576 | conv2d_171[0][0] |
| batch_normalization_174 (BatchN | (None, None, None, 2 768 | conv2d_174[0][0] |
| activation_171 (Activation) 71[0][0] | (None, None, None, 1 0 | batch_normalization_1 |
| activation_174 (Activation) | (None, None, None, 2 0</ | |

| | | | |
|--|------------------------------|--------|--------------------------------|
| 74[0][0] | | | |
| block8_3_mixed (Concatenate) | (None, None, None, 4 0 | | activation_171[0][0] |
| | | | activation_174[0][0] |
| block8_3_conv (Conv2D) | (None, None, None, 2 933920 | | block8_3_mixed[0][0] |
| block8_3 (Lambda) | (None, None, None, 2 0 | | block8_2_ac[0][0] |
| | | | block8_3_conv[0][0] |
| block8_3_ac (Activation) | (None, None, None, 2 0 | | block8_3[0][0] |
| conv2d_176 (Conv2D) | (None, None, None, 1 399360 | | block8_3_ac[0][0] |
| batch_normalization_176 (BatchN (None, None, None, 1 576 | | | conv2d_176[0][0] |
| activation_176 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 76[0][0] |
| conv2d_177 (Conv2D) | (None, None, None, 2 129024 | | activation_176[0][0] |
| batch_normalization_177 (BatchN (None, None, None, 2 672 | | | conv2d_177[0][0] |
| activation_177 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 77[0][0] |
| conv2d_175 (Conv2D) | (None, None, None, 1 399360 | | block8_3_ac[0][0] |
| conv2d_178 (Conv2D) | (None, None, None, 2 172032 | | activation_177[0][0] |
| batch_normalization_175 (BatchN (None, None, None, 1 576 | | | conv2d_175[0][0] |
| batch_normalization_178 (BatchN (None, None, None, 2 768 | | | conv2d_178[0][0] |
| activation_175 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 75[0][0] |
| activation_178 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 78[0][0] |
| block8_4_mixed (Concatenate) | (None, None, None, 4 0 | | activation_175[0][0] |
| | | | activation_178[0][0] |
| block8_4_conv (Conv2D) | (None, None, None, 2 933920 | | block8_4_mixed[0][0] |
| block8_4 (Lambda) | (None, None, None, 2 0 | | block8_3_ac[0][0] |
| | | | block8_4_conv[0][0] |
| block8_4_ac (Activation) | (None, None, None, 2 0 | | block8_4[0][0] |
| conv2d_180 (Conv2D) | (None, None, None, 1 399360 | | block8_4_ac[0][0] |
| batch_normalization_180 (BatchN (None, None, None, 1 576 | | | conv2d_180[0][0] |
| activation_180 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 80[0][0] |
| conv2d_181 (Conv2D) | (None, None, None, 2 129024 | | activation_180[0][0] |
| batch_normalization_181 (BatchN (None, None, None, 2 672 | | | conv2d_181[0][0] |
| activation_181 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 81[0][0] |
| conv2d_179 (Conv2D) | (None, None, None, 1 399360 | | block8_4_ac[0][0] |
| conv2d_182 (Conv2D) | (None, None, None, 2 172032 | | activation_181[0][0] |
| batch_normalization_179 (BatchN (None, None, None, 1 576 | | | conv2d_179[0][0] |
| batch_normalization_182 (BatchN (None, None, None, 2 768 | | | conv2d_182[0][0] |
| activation_179 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 79[0][0] |
| activation_182 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 82[0][0] |
| block8_5_mixed (Concatenate) | (None, None, None, 4 0 | | activation_179[0][0] |
| | | | activation_182[0][0] |
| block8_5_conv (Conv2D) | (None, None, None, 2 933920 | | block8_5_mixed[0][0] |
| block8_5 (Lambda) | (None, None, None, 2 0 | | block8_4_ac[0][0] |
| | | | block8_5_conv[0][0] |
| block8_5_ac (Activation) | (None, None, None, 2 0 | | block8_5[0][0] |
| conv2d_184 (Conv2D) | (None, None, None, 1 399360 | | block8_5_ac[0][0] |
| batch_normalization_184 (BatchN (None, None, None, 1 576 | | | conv2d_184[0][0] |
| activation_184 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 84[0][0] |
| conv2d_185 (Conv2D) | (None, None, None, 2 129024 | | activation_184[0][0] |
| batch_normalization_185 (BatchN (None, None, None, 2 672 | | | conv2d_185[0][0] |
| activation_185 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 85[0][0] |
| conv2d_183 (Conv2D) | (None, None, None, 1 399360 | | block8_5_ac[0][0] |
| conv2d_186 (Conv2D) | (None, None, None, 2 172032 | | activation_185[0][0] |
| batch_normalization_183 (BatchN (None, None, None, 1 576 | | | conv2d_183[0][0] |
| batch_normalization_186 (BatchN (None, None, None, 2 768 | | | conv2d_186[0][0] |
| activation_183 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 83[0][0] |
| activation_186 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 86[0][0] |
| block8_6_mixed (Concatenate) | (None, None, None, 4 0 | | activation_183[0][0] |
| | | | activation_186[0][0] |
| block8_6_conv (Conv2D) | (None, None, None, 2 933920 | | block8_6_mixed[0][0] |
| block8_6 (Lambda) | (None, None, None, 2 0 | | block8_5_ac[0][0] |
| | | | block8_6_conv[0][0] |
| block8_6_ac (Activation) | (None, None, None, 2 0 | | block8_6[0][0] |
| conv2d_188 (Conv2D) | (None, None, None, 1 399360 | | block8_6_ac[0][0] |
| batch_normalization_188 (BatchN (None, None, None, 1 576 | | | conv2d_188[0][0] |
| activation_188 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 88[0][0] |
| conv2d_189 (Conv2D) | (None, None, None, 2 129024 | | activation_188[0][0] |
| batch_normalization_189 (BatchN (None, None, None, 2 672 | | | conv2d_189[0][0] |
| activation_189 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 89[0][0] |
| conv2d_187 (Conv2D) | (None, None, None, 1 399360 | | block8_6_ac[0][0] |
| conv2d_190 (Conv2D) | (None, None, None, 2 172032 | | activation_189[0][0] |
| batch_normalization_187 (BatchN (None, None, None, 1 576 | | | conv2d_187[0][0] |
| batch_normalization_190 (BatchN (None, None, None, 2 768 | | | conv2d_190[0][0] |
| activation_187 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 87[0][0] |
| activation_190 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 90[0][0] |
| block8_7_mixed (Concatenate) | (None, None, None, 4 0 | | activation_187[0][0] |
| | | | activation_190[0][0] |
| block8_7_conv (Conv2D) | (None, None, None, 2 933920 | | block8_7_mixed[0][0] |
| block8_7 (Lambda) | (None, None, None, 2 0 | | block8_6_ac[0][0] |
| | | | block8_7_conv[0][0] |
| block8_7_ac (Activation) | (None, None, None, 2 0 | | block8_7[0][0] |
| conv2d_192 (Conv2D) | (None, None, None, 1 399360 | | block8_7_ac[0][0] |
| batch_normalization_192 (BatchN (None, None, None, 1 576 | | | conv2d_192[0][0] |
| activation_192 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 92[0][0] |
| conv2d_193 (Conv2D) | (None, None, None, 2 129024 | | activation_192[0][0] |
| batch_normalization_193 (BatchN (None, None, None, 2 672 | | | conv2d_193[0][0] |
| activation_193 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 93[0][0] |
| conv2d_191 (Conv2D) | (None, None, None, 1 399360 | | block8_7_ac[0][0] |
| conv2d_194 (Conv2D) | (None, None, None, 2 172032 | | activation_193[0][0] |
| batch_normalization_191 (BatchN (None, None, None, 1 576 | | | conv2d_191[0][0] |
| batch_normalization_194 (BatchN (None, None, None, 2 768 | | | conv2d_194[0][0] |
| activation_191 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 91[0][0] |
| activation_194 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 94[0][0] |
| block8_8_mixed (Concatenate) | (None, None, None, 4 0 | | activation_191[0][0] |
| | | | activation_194[0][0] |
| block8_8_conv (Conv2D) | (None, None, None, 2 933920 | | block8_8_mixed[0][0] |
| block8_8 (Lambda) | (None, None, None, 2 0 | | block8_7_ac[0][0] |
| | | | block8_8_conv[0][0] |
| block8_8_ac (Activation) | (None, None, None, 2 0 | | block8_8[0][0] |
| conv2d_196 (Conv2D) | (None, None, None, 1 399360 | | block8_8_ac[0][0] |
| batch_normalization_196 (BatchN (None, None, None, 1 576 | | | conv2d_196[0][0] |
| activation_196 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 96[0][0] |
| conv2d_197 (Conv2D) | (None, None, None, 2 129024 | | activation_196[0][0] |
| batch_normalization_197 (BatchN (None, None, None, 2 672 | | | conv2d_197[0][0] |
| activation_197 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 97[0][0] |
| conv2d_195 (Conv2D) | (None, None, None, 1 399360 | | block8_8_ac[0][0] |
| conv2d_198 (Conv2D) | (None, None, None, 2 172032 | | activation_197[0][0] |
| batch_normalization_195 (BatchN (None, None, None, 1 576 | | | conv2d_195[0][0] |
| batch_normalization_198 (BatchN (None, None, None, 2 768 | | | conv2d_198[0][0] |
| activation_195 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 95[0][0] |
| activation_198 (Activation) | (None, None, None, 2 0 | | batch_normalization_1 98[0][0] |
| block8_9_mixed (Concatenate) | (None, None, None, 4 0 | | activation_195[0][0] |
| | | | activation_198[0][0] |
| block8_9_conv (Conv2D) | (None, None, None, 2 933920 | | block8_9_mixed[0][0] |
| block8_9 (Lambda) | (None, None, None, 2 0 | | block8_8_ac[0][0] |
| | | | block8_9_conv[0][0] |
| block8_9_ac (Activation) | (None, None, None, 2 0 | | block8_9[0][0] |
| conv2d_200 (Conv2D) | (None, None, None, 1 399360 | | block8_9_ac[0][0] |
| batch_normalization_200 (BatchN (None, None, None, 1 576 | | | conv2d_200[0][0] |
| activation_200 (Activation) | (None, None, None, 1 0 | | batch_normalization_2 00[0][0] |
| conv2d_201 (Conv2D) | (None, None, None, 2 129024 | | activation_200[0][0] |
| batch_normalization_201 (BatchN (None, None, None, 2 672 | | | conv2d_201[0][0] |
| activation_201 (Activation) | (None, None, None, 2 0 | | batch_normalization_2 01[0][0] |
| conv2d_199 (Conv2D) | (None, None, None, 1 399360 | | block8_9_ac[0][0] |
| conv2d_202 (Conv2D) | (None, None, None, 2 172032 | | activation_201[0][0] |
| batch_normalization_199 (BatchN (None, None, None, 1 576 | | | conv2d_199[0][0] |
| batch_normalization_202 (BatchN (None, None, None, 2 768 | | | conv2d_202[0][0] |
| activation_199 (Activation) | (None, None, None, 1 0 | | batch_normalization_1 99[0][0] |
| activation_202 (Activation) | (None, None, None, 2 0 | | batch_normalization_2 02[0][0] |
| block8_10_mixed (Concatenate) | (None, None, None, 4 0 | | activation_199[0][0] |
| | | | activation_202[0][0] |
| block8_10_conv (Conv2D) | (None, None, None, 2 933920 | | block8_10_mixed[0][0] |
| block8_10 (Lambda) | (None, None, None, 2 0 | | block8_9_ac[0][0] |
| | | | block8_10_conv[0][0] |
| conv_7b (Conv2D) | (None, None, None, 1 3194980 | | block8_10[0][0] |
| conv_7b_bn (BatchNormalization) | (None, None, None, 1 4608 | | conv_7b[0][0] |
| conv_7b_ac (Activation) | (None, None, None, 1 0 | | conv_7b_bn[0][0] |
| global_max_pooling2d (GlobalMax (None, 1536) | | 0 | conv_7b_ac[0][0] |
| dense (Dense) | (None, 128) | 196736 | global_max_pooling2d [0][0] |
| dense_1 (Dense) | (None, 64) | 8256 | dense[0][0] |
| dense_2 (Dense) | (None, 32) | 2080 | dense_1[0][0] |
| dropout (Dropout) | (None, 32) | 0 | dense_2[0][0] |
| dense_3 (Dense) | (None, 3) | 99 | dropout[0][0] |

```
In [6]: #congelando os neurônios já treinados na ImageNet, queremos retrainar somente a última
for l in model.layers:
    l.trainable=False
else:
    l.trainable=True
```

```
In [7]: #definindo objeto que apanhara todas as imagens de treino, processando as imagens com
train_data_generator = tf.keras.preprocessing.image.ImageDataGenerator(preprocessing_function=
test_data_generator = tf.keras.preprocessing.image.ImageDataGenerator(preprocessing_function=
```

```
In [8]: #ACERDANDO PRÓPRIO DATASET PARA USO
#target_size=(224, 224)
#definindo gerador de imagens de treino
train_generator = train_data_gen.flow_from_directory('shapes_split/train', #target_size=(224, 228), # tamanho da
#batch_size=batch,
class_mode='categorical',
shuffle=True)
#definindo gerador de imagens de teste
test_generator = test_data_gen.flow_from_directory('shapes_split/test',
#target_size=(224, 228), # tamanho da
#batch_size=batch,
class_mode='categorical',
shuffle=True)
Found 240 images belonging to 3 classes.
Found 60 images belonging to 3 classes.
```

```
In [9]: lr = tf.keras.optimizers.Adam(learning_rate=0.001) #estabelecendo taxa de otimização
model.compile(optimizer=lr, loss='categorical_crossentropy', metrics=['accuracy'])
```

```
In [10]: #definicao dos steps
step_size_train = train_generator.train_generator.batch_size
step_size_test = test_generator.train_generator.batch_size
```

```
In [11]: #treinando e testando o modelo
history = model.fit_generator(generator=train_generator,
                             steps_per_epoch=step_size_train,
                             validation_data=test_generator.validation_data,
                             validation_steps=step_size_test)
Epoch 1/500
c:\Users\vinicius\appdata\local\programs\python\python39\lib\site-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 gene
rators.
warnings.warn('Model.fit_generator() is deprecated and
val_loss: 1.4595e-04 - val_accuracy: 1.0000 - 8s 1s/step - loss: 1.1249 - accuracy: 0.5634 -
val_loss: 0.0041 - val_accuracy: 1.0000
Epoch 3/500
7/7 ===== - 10s 1s/step - loss: 0.1385 - accuracy: 0.9500 -
val_loss: 0.0041 - val_accuracy: 1.0000
Epoch 4/500
7/7 ===== - 10s 1s/step - loss: 0.1463 - accuracy: 0.9330 -
val_loss: 0.0032 - val_accuracy: 1.0000
Epoch 5/500
7/7 ===== - 11s 2s/step - loss: 0.0435 - accuracy: 0.9847 -
val_loss: 0.0063 - val_accuracy: 1.0000
Epoch 6/500
7/7 ===== - 10s 1s/step - loss: 0.0302 - accuracy: 0.9949 -
val_loss: 2.1604e-04 - val_accuracy: 1.0000
Epoch 7/500
7/7 ===== - 9s 1s/step - loss: 0.0688 - accuracy: 0.9709 -
val_loss: 2.3120e-05 - val_accuracy: 1.0000
Epoch 8/500
7/7 ===== - 9s 1s/step - loss: 0.0105 - accuracy: 1.0000 -
val_loss: 3.4236e-05 - val_accuracy: 1.0000
Epoch 9/500
7/7 ===== - 9s 1s/step - loss: 0.0708 - accuracy: 0.9767 -
val_loss: 1.0092e-04 - val_accuracy: 1.0000
Epoch 10/500
7/7 ===== - 9s 1s/step - loss: 0.0552 - accuracy: 0.9680 -
val_loss: 3.7671e-05 - val_accuracy: 1.0000
Epoch 11/500
7/7 ===== - 9s 1s/step - loss: 0.0230 - accuracy: 0.9849 -
val_loss: 3.3979e-05 - val_accuracy: 1.0000
Epoch 12/500
7/7 ===== - 8s 1s/step - loss: 0.0294 - accuracy: 0.9943 -
val_loss: 1.5250e-05 - val_accuracy: 1.0000
Epoch 13/500
7/7 ===== - 8s 1s/step - loss: 0.0123 - accuracy: 0.9981 -
val_loss: 1.5781e-05 - val_accuracy: 1.0000
Epoch 14/500
7/7 ===== - 8s 1s/step - loss: 0.0086 - accuracy: 1.0000 -
val_loss: 5.4445e-05 - val_accuracy: 1.0000
Epoch 15/500
7/7 ===== - 8s 1s/step - loss: 0.0386 - accuracy: 0.9782 -
val_loss: 5.5431e-05 - val_accuracy: 1.0000
Epoch 16/500
7/7 ===== - 8s 1s/step - loss: 0.0142 - accuracy: 1.0000 -
val_loss: 4.3845e-05 - val_accuracy: 1.0000
Epoch 17/500
7/7 ===== - 9s 1s/step - loss: 0.0258 - accuracy: 0.9869 -
val_loss: 1.2277e-05 - val_accuracy: 1.0000
Epoch 18/500
7/7 ===== - 9s 1s/step - loss: 0.0067 - accuracy: 0.9964 -
val_loss: 1.3746e-06 - val_accuracy: 1.0000
Epoch 19/500
7/7 ===== - 8s 1s/step - loss: 0.0234 - accuracy: 0.9887 -
val_loss: 1.5472e-04 - val_accuracy: 1.0000
Epoch 20/500
7/7 ===== - 9s 1s/step - loss: 0.0122 - accuracy: 0.9982 -
val_loss: 2.7866e-05 - val_accuracy: 1.0000
Epoch 21/500
7/7 ===== - 8s 1s/step - loss: 0.0223 - accuracy: 0.9865 -
val_loss: 0.0047 - val_accuracy: 1.0000
Epoch 22/500
7/7 ===== - 8s 1s/step - loss: 0.0059 - accuracy: 1.0000 -
val_loss: 0.0024 - val_accuracy: 1.0000
Epoch 23/500
7/7 ===== - 9s 1s/step - loss: 0.0101 - accuracy: 0.9947 -
val_loss: 7.9348e-07 - val_accuracy: 1.0000
Epoch 24/500
7/7 ===== - 8s 1s/step - loss: 0.0059 - accuracy: 0.9973 -
val_loss: 5.4517e-06 - val_accuracy: 1.0000
Epoch 25/500
7/7 ===== - 8s 1s/step - loss: 0.0076 - accuracy: 1.0000 -
val_loss: 3.7026e-07 - val_accuracy: 1.0000
Epoch 26/500
7/7 ===== - 8s 1s/step - loss: 0.0152 - accuracy: 1.0000 -
val_loss: 2.6569e-04 - val_accuracy: 1.0000
Epoch 27/500
7/7 ===== - 8s 1s/step - loss: 0.0177 - accuracy: 0.9981 -
val_loss: 1.4603e-06 - val_accuracy: 1.0000
Epoch 28/500
7/7 ===== - 8s 1s/step - loss: 0.0136 - accuracy: 0.9892 -
val_loss: 1.8226e-04 - val_accuracy: 1.0000
Epoch 29/500
7/7 ===== - 8s 1s/step - loss: 0.0053 - accuracy: 1.0000 -
val_loss: 1.0059e-04 - val_accuracy: 1.0000
Epoch 30/500
7/7 ===== - 8s 1s/step - loss: 0.0097 - accuracy: 0.9945 -
val_loss: 1.0001e-04 - val_accuracy: 1.0000
Epoch 31/500
7/7 ===== - 8s 1s/step - loss: 0.0042 - accuracy: 0.9988 -
val_loss: 7.7026e-05 - val_accuracy: 1.0000
Epoch 32/500
7/7 ===== - 8s 1s/step - loss: 0.0026 - accuracy: 0.9988 -
val_loss: 1.2393e-07 - val_accuracy: 1.0000
Epoch 33/500
7/7 ===== - 8s 1s/step - loss: 0.0151 - accuracy: 0.9887 -
val_loss: 9.3975e-06 - val_accuracy: 1.0000
Epoch 34/500
7/7 ===== - 8s 1s/step - loss: 0.0058 - accuracy: 0.9972 -
val_loss: 1.8104e-06 - val_accuracy: 1.0000
Epoch 35/500
7/7 ===== - 8s 1s/step - loss: 0.0027 - accuracy: 1.0000 -
val_loss: 1.6165e-07 - val_accuracy: 1.0000
Epoch 36/500
7/7 ===== - 8s 1s/step - loss: 0.0019 - accuracy: 0.9972 -
val_loss: 1.8104e-06 - val_accuracy: 1.0000
Epoch 37/500
7/7 ===== - 8s 1s/step - loss: 0.0015 - accuracy: 0.9972 -
val_loss: 1.6349e-07 - val_accuracy: 1.0000
Epoch 38/500
7/7 ===== - 8s 1s/step - loss: 0.0173 - accuracy: 0.9892 -
val_loss: 1.9334e-06 - val_accuracy: 1.0000
Epoch 39/500
7/7 ===== - 8s 1s/step - loss: 0.0098 - accuracy: 0.9926 -
val_loss: 1.0541e-05 - val_accuracy: 1.0000
Epoch 40/500
7/7 ===== - 9s 1s/step - loss: 0.0193 - accuracy: 1.0000 -
val_loss: 0.0039 - val_accuracy: 1.0000
Epoch 41/500
7/7 ===== - 8s 1s/step - loss: 5.3733e-04 - accuracy: 1.000 0 -
val_loss: 9.6301e-04 - val_accuracy: 1.0000
Epoch 42/500
7/7 ===== - 8s 1s/step - loss: 0.0036 - accuracy: 1.0000 -
val_loss: 3.6694e-04 - val_accuracy: 1.0000
Epoch 43/500
7/7 ===== - 8s 1s/step - loss: 0.0103 - accuracy: 0.9961 -
val_loss: 1.4901e-08 - val_accuracy: 1.0000
Epoch 44/500
7/7 ===== - 8s 1s/step - loss: 0.0049 - accuracy: 0.9948 -
val_loss: 5.5879e-08 - val_accuracy: 1.0000
Epoch 45/500
7/7 ===== - 9s 1s/step - loss: 0.0042 - accuracy: 1.0000 -
val_loss: 3.5390e-07 - val_accuracy: 1.0000
Epoch 46/500
7/7 ===== - 8s 1s/step - loss: 0.0056 - accuracy: 0.9972 -
val_loss: 3.7253e-09 - val_accuracy: 1.0000
Epoch 47/500
7/7 ===== - 8s 1s/step - loss: 0.0077 - accuracy: 0.9928 -
val_loss: 8.5308e-07 - val_accuracy: 1.0000
Epoch 48/500
7/7 ===== - 8s 1s/step - loss: 0.0155 - accuracy: 0.9907 -
val_loss: 1.8656e-04 - val_accuracy: 1.0000
Epoch 49/500
7/7 ===== - 9s 1s/step - loss: 0.0310 - accuracy: 0.9790 -
val_loss: 0.0795e-04 - val_accuracy: 1.0000
Epoch 50/500
7/7 ===== - 9s 1s/step - loss: 0.0075 - accuracy: 0.9972 -
val_loss: 2.9057e-07 - val_accuracy: 1.0000
Epoch 51/500
7/7 ===== - 8s 1s/step - loss: 0.0146 - accuracy: 0.9972 -
val_loss: 1.3251e-04 - val_accuracy: 1.0000
Epoch 52/500
7/7 ===== - 8s 1s/step - loss: 0.0077 - accuracy: 1.0000 -
val_loss: 0.0013 - val_accuracy: 1.0000
Epoch 53/500
7/7 ===== - 8s 1s/step - loss: 0.0018 - accuracy: 0.9988 -
val_loss: 0.0012 - val_accuracy: 1.0000
Epoch 54/500
7/7 ===== - 9s 1s/step - loss: 0.0072 - accuracy: 0.9972 -
val_loss: 5.4050e-06 - val_accuracy: 1.0000
Epoch 55/500
7/7 ===== - 8s 1s/step - loss: 0.0551 - accuracy: 0.9761 -
val_loss: 7.4007e-07 - val_accuracy: 1.0000
Epoch 56/500
7/7 ===== - 8s 1s/step - loss: 7.6157e-05 - accuracy: 1.000 0 -
val_loss: 1.1118e-05 - val_accuracy: 1.0000
Epoch 57/500
7/7 ===== - 8s 1s/step - loss: 0.0288 - accuracy: 0.9843 -
val_loss: 1.8656e-04 - val_accuracy: 1.0000
Epoch 58/500
7/7 ===== - 8s 1s/step - loss: 0.0112 - accuracy: 0.9887 -
val_loss: 7.4506e-09 - val_accuracy: 1.0000
Epoch 59/500
7/7 ===== - 8s 1s/step - loss: 0.0020 - accuracy: 0.9988 -
val_loss: 7.4506e-08 - val_accuracy: 1.0000
Epoch 60/500
7/7 ===== - 8s 1s/step - loss: 0.0023 - accuracy: 1.0000 -
val_loss: 6.3306e-08 - val_accuracy: 1.0000
Epoch 61/500
7/7 ===== - 8s 1s/step - loss: 0.0013 - accuracy: 1.0000 -
val_loss: 2.4316e-07 - val_accuracy: 1.0000
Epoch 62/500
7/7 ===== - 8s 1s/step - loss: 0.0028 - accuracy: 1.0000 -
val_loss: 4.4703e-08 - val_accuracy: 1.0000
Epoch 63/500
7/7 ===== - 9s 1s/step - loss: 0.0029 - accuracy: 1.0000 -
val_loss: 1.8626e-08 - val_accuracy: 1.0000
Epoch 64/500
7/7 ===== - 8s 1s/step - loss: 6.7388e-05 - accuracy: 1.000 0 -
val_loss: 0.0039 - val_accuracy: 1.0000
Epoch 65/500
7/7 ===== - 8s 1s/step - loss: 0.0033 - accuracy: 1.0000 -
val_loss: 3.7253e-09 - val_accuracy: 1.0000
Epoch 66/500
7/7 ===== - 8s 1s/step - loss: 0.0179 - accuracy:
```

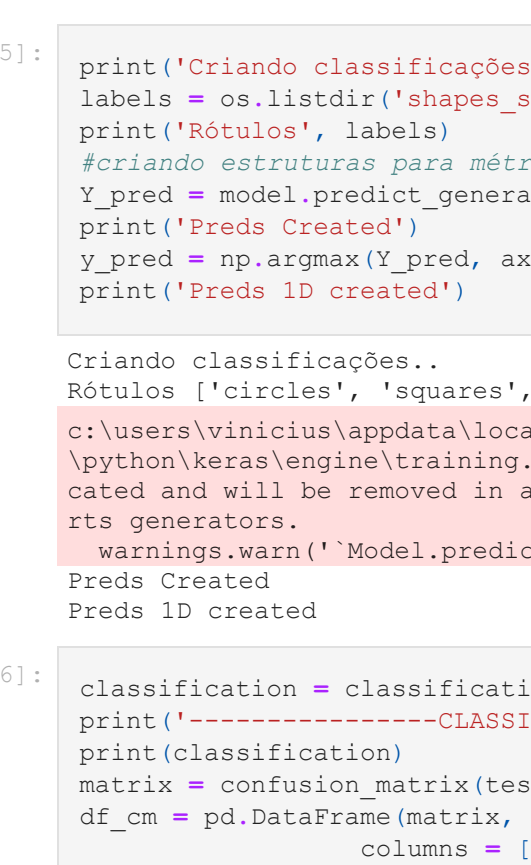


```
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
7/7 ===== - 8s 1s/step - loss: 1.1203e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 442/500
7/7 ===== - 8s 1s/step - loss: 5.1236e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 443/500
7/7 ===== - 8s 1s/step - loss: 0.0097 - accuracy: 0.9931 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 444/500
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 445/500
7/7 ===== - 8s 1s/step - loss: 2.5959e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 446/500
7/7 ===== - 8s 1s/step - loss: 1.6688e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 447/500
7/7 ===== - 8s 1s/step - loss: 3.0246e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 448/500
7/7 ===== - 8s 1s/step - loss: 1.5792e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 449/500
7/7 ===== - 8s 1s/step - loss: 1.8478e-08 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 450/500
7/7 ===== - 8s 1s/step - loss: 0.0042 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 451/500
7/7 ===== - 8s 1s/step - loss: 1.2566e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 452/500
7/7 ===== - 8s 1s/step - loss: 7.9657e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 453/500
7/7 ===== - 8s 1s/step - loss: 0.0054 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 454/500
7/7 ===== - 8s 1s/step - loss: 1.2232e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 455/500
7/7 ===== - 8s 1s/step - loss: 2.3360e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 456/500
7/7 ===== - 8s 1s/step - loss: 0.0205 - accuracy: 0.9889 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 457/500
7/7 ===== - 8s 1s/step - loss: 3.2982e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 458/500
7/7 ===== - 8s 1s/step - loss: 4.6577e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 459/500
7/7 ===== - 8s 1s/step - loss: 1.0535e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 460/500
7/7 ===== - 8s 1s/step - loss: 1.7331e-08 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 461/500
7/7 ===== - 9s 1s/step - loss: 0.0108 - accuracy: 0.9952 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 462/500
7/7 ===== - 8s 1s/step - loss: 5.2323e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 463/500
7/7 ===== - 8s 1s/step - loss: 0.0038 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 464/500
7/7 ===== - 8s 1s/step - loss: 0.0057 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 465/500
7/7 ===== - 8s 1s/step - loss: 2.2977e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 466/500
7/7 ===== - 8s 1s/step - loss: 0.0019 - accuracy: 0.9988 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 467/500
7/7 ===== - 8s 1s/step - loss: 9.5840e-09 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 468/500
7/7 ===== - 8s 1s/step - loss: 2.7657e-05 - accuracy: 1.000
0 - val_loss: 3.7253e-09 - val_accuracy: 1.0000
Epoch 469/500
7/7 ===== - 8s 1s/step - loss: 1.4144e-07 - accuracy: 1.000
0 - val_loss: 3.7253e-09 - val_accuracy: 1.0000
Epoch 470/500
7/7 ===== - 8s 1s/step - loss: 0.0065 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 471/500
7/7 ===== - 8s 1s/step - loss: 0.0038 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 472/500
7/7 ===== - 8s 1s/step - loss: 1.3914e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 473/500
7/7 ===== - 8s 1s/step - loss: 9.6866e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 474/500
7/7 ===== - 8s 1s/step - loss: 4.3658e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 475/500
7/7 ===== - 8s 1s/step - loss: 6.1677e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 476/500
7/7 ===== - 8s 1s/step - loss: 0.0073 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 477/500
7/7 ===== - 8s 1s/step - loss: 7.7008e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 478/500
7/7 ===== - 8s 1s/step - loss: 0.0019 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 479/500
7/7 ===== - 8s 1s/step - loss: 4.3050e-07 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 480/500
7/7 ===== - 8s 1s/step - loss: 1.0039e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 481/500
7/7 ===== - 8s 1s/step - loss: 0.0055 - accuracy: 0.9988 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 482/500
7/7 ===== - 8s 1s/step - loss: 1.9614e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 483/500
7/7 ===== - 8s 1s/step - loss: 1.6581e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 484/500
7/7 ===== - 8s 1s/step - loss: 0.0042 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 485/500
7/7 ===== - 8s 1s/step - loss: 1.0970e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 486/500
7/7 ===== - 9s 1s/step - loss: 4.3225e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 487/500
7/7 ===== - 8s 1s/step - loss: 1.1323e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 488/500
7/7 ===== - 8s 1s/step - loss: 7.5534e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 489/500
7/7 ===== - 9s 1s/step - loss: 1.1419e-07 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 490/500
7/7 ===== - 8s 1s/step - loss: 6.1312e-09 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 491/500
7/7 ===== - 8s 1s/step - loss: 5.3332e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 492/500
7/7 ===== - 8s 1s/step - loss: 0.0097 - accuracy: 0.9919 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 493/500
7/7 ===== - 8s 1s/step - loss: 8.0440e-04 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 494/500
7/7 ===== - 9s 1s/step - loss: 1.0379e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 495/500
7/7 ===== - 8s 1s/step - loss: 1.8049e-08 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 496/500
7/7 ===== - 8s 1s/step - loss: 2.7086e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 497/500
7/7 ===== - 8s 1s/step - loss: 4.5127e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 498/500
7/7 ===== - 8s 1s/step - loss: 0.0057 - accuracy: 0.9973 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 499/500
7/7 ===== - 8s 1s/step - loss: 0.0051 - accuracy: 1.0000 -
val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 500/500
7/7 ===== - 8s 1s/step - loss: 9.8971e-05 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
Epoch 501/500
7/7 ===== - 8s 1s/step - loss: 3.0507e-06 - accuracy: 1.000
0 - val_loss: 0.0000e+00 - val_accuracy: 1.0000
```

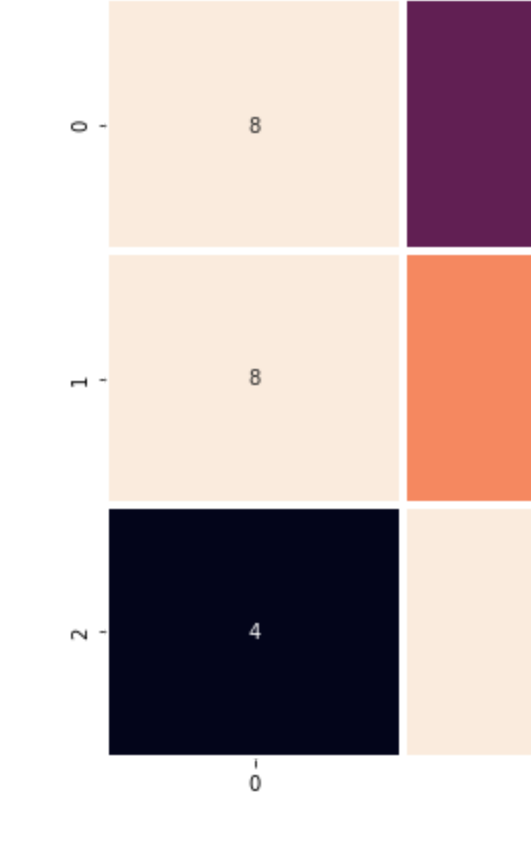
```
In [12]: #Avaliando o modelo
loss_train, train_acc = model.evaluate_generator(train_generator, steps=step_size_train, test=test, test_acc = model.evaluate_generator(test_generator, steps=step_size_test))
print('Train: %.3f, Test: %.3f' % (train_acc, test_acc))

c:\users\vinicius\appdata\local\programs\python\python39\lib\site-packages\tensorflow\python\keras\engine\training.py:1973: UserWarning: 'Model.evaluate_generator' is deprecated and will be removed in a future version. Please use 'Model.evaluate', which supports generators.
  warnings.warn('Model.evaluate_generator' is deprecated and
Train: 1.000, Test: 1.000
```

```
In [13]: #Apresentando resultados em graficos
plt.title('Loss')
plt.plot(history.history('loss'), label='train')
plt.plot(history.history('val_loss'), label='test')
plt.legend()
plt.show()
```



```
In [14]: # Criando graficos para visualiza  o dos resultados
plt.title('Accuracy')
plt.plot(history.history('accuracy'), label='train')
plt.plot(history.history('val_accuracy'), label='test')
plt.legend()
plt.show()
```



```
In [15]: print('Criando classifica  es..')
labels = os.listdir('shapes_split/test')
print('Rotulos', labels)
#criando estruturas para m tricas de avalia  o, processo um pouco mais demorado
Y_pred = model.predict_generator(test_generator)
print('Preds Created')
y_pred = np.argmax(Y_pred, axis=1)
print('Preds 1D created')

Criando classifica  es..
Rotulos ['circles', 'squares', 'triangles']
c:\users\vinicius\appdata\local\programs\python\python39\lib\site-packages\tensorflow\python\keras\engine\training.py:1973: UserWarning: 'Model.predict_generator' is deprecated and will be removed in a future version. Please use 'Model.predict', which supports generators.
  warnings.warn('Model.predict_generator' is deprecated and
Preds Created
Preds 1D created
```

```
In [16]: classification = classification_report(test_generator.classes, y_pred, target_names=labels,
print('-----CLASSIFICATION-----')
print(classification)
matrix = confusion_matrix(test_generator.classes, y_pred)
df_cm = pd.DataFrame(matrix, index = [i for i in range(3)],
columns = [i for i in range(3)])
plt.figure(figsize = (10,7))
print('-----MATRIX-----')
sns.heatmap(df_cm, annot=True, linewidths=2.5)
```

| | precision | recall | f1-score | support |
|--------------|-----------|--------|----------|---------|
| circles | 0.40 | 0.40 | 0.40 | 20 |
| squares | 0.35 | 0.35 | 0.35 | 20 |
| triangles | 0.40 | 0.40 | 0.40 | 20 |
| accuracy | | | 0.38 | 60 |
| macro avg | 0.38 | 0.38 | 0.38 | 60 |
| weighted avg | 0.38 | 0.38 | 0.38 | 60 |

```
Out[16]: <AxesSubplot>
```

