In [2]:
```
!unzip '/content/drive/My Drive/Covid19Pred/Dataset_kaggle.zip'

!pip install split_folders

import split_folders
split_folders.ratio('/content/Dataset_kaggle', output="output", seed=1337, ratio=

import pandas as pd
import numpy as np
import os
import tensorflow as tf
import keras
import matplotlib.pyplot as plt
from tensorflow.keras.layers import Dense, GlobalAveragePooling2D
#from tensorflow.keras.applications.vgg16 import VGG16
from tensorflow.keras.preprocessing import image
from tensorflow.keras.applications.vgg16 import preprocess_input
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.models import Model
from tensorflow.keras.optimizers import Adam
from tensorflow.keras.applications import DenseNet201
#from tensorflow.keras.applications.ResNet152 import preprocess_input

image_size = [224,224]
data_path = '/content/output'

dense = DenseNet201(input_shape= image_size+[3],weights='imagenet',include_top=Fa

x = dense.output
x = GlobalAveragePooling2D()(x)

x = Dense(1024,activation='relu')(x)
x = Dense(1024,activation='relu')(x)
x = Dense(512, activation='relu')(x)

preds = Dense(2,activation='softmax')(x)

model = Model(inputs = dense.input,outputs=preds)

for layer in dense.layers:
    layer.trainable = False

train_datagen=ImageDataGenerator(preprocessing_function=preprocess_input) #inclu
test_datagen=ImageDataGenerator(preprocessing_function=preprocess_input)
train_generator=train_datagen.flow_from_directory('/content/output/train', # this
                                                  target_size=(224,224),
                                                  color_mode='rgb',
                                                  batch_size=32,
                                                  class_mode='categorical',
                                                  shuffle=True)
test_generator=test_datagen.flow_from_directory('/content/output/val', # this is
                                                  target_size=(224,224),
                                                  color_mode='rgb',
                                                  batch_size=32,
                                                  shuffle=False)
```

```
model.compile(optimizer='Adam',
              loss='categorical_crossentropy',
              metrics=['accuracy'])


print(train_generator.n)
print(train_generator.batch_size)
print(746//32)

step_size_train=train_generator.n//train_generator.batch_size
r = model.fit_generator(generator=train_generator,
                    validation_data=test_generator,
                   steps_per_epoch=step_size_train,
                   epochs=30)


acc=model.evaluate_generator(test_generator)
print(acc[1])
```

```
Archive:  /content/drive/My Drive/Covid19Pred/Dataset_kaggle.zip
replace Dataset_kaggle/COVID/Covid (1).png? [y]es, [n]o, [A]ll, [N]one, [r]enam
e: N
Requirement already satisfied: split_folders in /usr/local/lib/python3.6/dist-p
ackages (0.3.1)

Copying files: 2481 files [00:01, 2030.88 files/s]

Found 1984 images belonging to 2 classes.
Found 497 images belonging to 2 classes.
1984
32
23
Epoch 1/30
62/62 [==============================] - 27s 432ms/step - loss: 0.9225 - accu
racy: 0.7596 - val_loss: 0.3101 - val_accuracy: 0.8612
Epoch 2/30
62/62 [==============================] - 23s 377ms/step - loss: 0.2964 - accu
racy: 0.8805 - val_loss: 0.3245 - val_accuracy: 0.8632
Epoch 3/30
62/62 [==============================] - 23s 378ms/step - loss: 0.2214 - accu
racy: 0.9052 - val_loss: 0.3422 - val_accuracy: 0.8652
Epoch 4/30
62/62 [==============================] - 23s 377ms/step - loss: 0.1961 - accu
racy: 0.9219 - val_loss: 0.1740 - val_accuracy: 0.9376
Epoch 5/30
62/62 [==============================] - 23s 378ms/step - loss: 0.2281 - accu
racy: 0.9093 - val_loss: 0.1913 - val_accuracy: 0.9195
Epoch 6/30
62/62 [==============================] - 23s 379ms/step - loss: 0.1448 - accu
racy: 0.9435 - val_loss: 0.2277 - val_accuracy: 0.9034
Epoch 7/30
62/62 [==============================] - 23s 379ms/step - loss: 0.1500 - accu
racy: 0.9365 - val_loss: 0.1860 - val_accuracy: 0.9175
Epoch 8/30
62/62 [==============================] - 23s 378ms/step - loss: 0.0920 - accu
racy: 0.9592 - val_loss: 0.1810 - val_accuracy: 0.9276
Epoch 9/30
```

```
62/62 [==============================] - 23s 378ms/step - loss: 0.0779 - accu
racy: 0.9677 - val_loss: 0.1166 - val_accuracy: 0.9517
Epoch 10/30
62/62 [==============================] - 23s 377ms/step - loss: 0.1343 - accu
racy: 0.9506 - val_loss: 0.1416 - val_accuracy: 0.9537
Epoch 11/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0812 - accu
racy: 0.9637 - val_loss: 0.1802 - val_accuracy: 0.9296
Epoch 12/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0920 - accu
racy: 0.9617 - val_loss: 0.2138 - val_accuracy: 0.9296
Epoch 13/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0600 - accu
racy: 0.9763 - val_loss: 0.1810 - val_accuracy: 0.9336
Epoch 14/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0982 - accu
racy: 0.9617 - val_loss: 0.2992 - val_accuracy: 0.8632
Epoch 15/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0724 - accu
racy: 0.9698 - val_loss: 0.1765 - val_accuracy: 0.9437
Epoch 16/30
62/62 [==============================] - 23s 376ms/step - loss: 0.0387 - accu
racy: 0.9869 - val_loss: 0.2561 - val_accuracy: 0.9416
Epoch 17/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0776 - accu
racy: 0.9708 - val_loss: 0.3017 - val_accuracy: 0.8954
Epoch 18/30
62/62 [==============================] - 23s 378ms/step - loss: 0.0530 - accu
racy: 0.9788 - val_loss: 0.2597 - val_accuracy: 0.9034
Epoch 19/30
62/62 [==============================] - 23s 378ms/step - loss: 0.0485 - accu
racy: 0.9884 - val_loss: 0.1715 - val_accuracy: 0.9416
Epoch 20/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0471 - accu
racy: 0.9849 - val_loss: 0.1971 - val_accuracy: 0.9416
Epoch 21/30
62/62 [==============================] - 23s 376ms/step - loss: 0.0490 - accu
racy: 0.9808 - val_loss: 0.1820 - val_accuracy: 0.9416
Epoch 22/30
62/62 [==============================] - 23s 378ms/step - loss: 0.0488 - accu
racy: 0.9849 - val_loss: 0.1380 - val_accuracy: 0.9638
Epoch 23/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0504 - accu
racy: 0.9803 - val_loss: 0.1493 - val_accuracy: 0.9557
Epoch 24/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0373 - accu
racy: 0.9859 - val_loss: 0.2022 - val_accuracy: 0.9416
Epoch 25/30
62/62 [==============================] - 23s 376ms/step - loss: 0.0441 - accu
racy: 0.9839 - val_loss: 0.2082 - val_accuracy: 0.9376
Epoch 26/30
62/62 [==============================] - 23s 378ms/step - loss: 0.0147 - accu
racy: 0.9945 - val_loss: 0.5352 - val_accuracy: 0.8994
Epoch 27/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0507 - accu
racy: 0.9814 - val_loss: 0.2254 - val_accuracy: 0.9356
Epoch 28/30
```

```
62/62 [==============================] - 23s 377ms/step - loss: 0.0176 - accu
racy: 0.9940 - val_loss: 0.1619 - val_accuracy: 0.9678
Epoch 29/30
62/62 [==============================] - 23s 377ms/step - loss: 0.0036 - accu
racy: 0.9985 - val_loss: 0.2268 - val_accuracy: 0.9618
Epoch 30/30
62/62 [==============================] - 23s 377ms/step - loss: 0.1019 - accu
racy: 0.9748 - val_loss: 0.2057 - val_accuracy: 0.9195
WARNING:tensorflow:From <ipython-input-2-712f8dce2bcf>:73: Model.evaluate_gen
erator (from tensorflow.python.keras.engine.training) is deprecated and will
be removed in a future version.
Instructions for updating:
Please use Model.evaluate, which supports generators.
0.9195170998573303
```

In [ ]: