In [ ]:

```
```

In [1]:

```
!unzip '/content/drive/My Drive/Covid19Pred/Dataset_kaggle.zip'
```

```
Archive:  /content/drive/My Drive/Covid19Pred/Dataset_kaggle.zip
   creating: Dataset_kaggle/
   creating: Dataset_kaggle/COVID/
 extracting: Dataset_kaggle/COVID/Covid (1).png
  inflating: Dataset_kaggle/COVID/Covid (10).png
  inflating: Dataset_kaggle/COVID/Covid (100).png
  inflating: Dataset_kaggle/COVID/Covid (1000).png
  inflating: Dataset_kaggle/COVID/Covid (1001).png
  inflating: Dataset_kaggle/COVID/Covid (1002).png
  inflating: Dataset_kaggle/COVID/Covid (1003).png
  inflating: Dataset_kaggle/COVID/Covid (1004).png
  inflating: Dataset_kaggle/COVID/Covid (1005).png
  inflating: Dataset_kaggle/COVID/Covid (1006).png
  inflating: Dataset_kaggle/COVID/Covid (1007).png
  inflating: Dataset_kaggle/COVID/Covid (1008).png
  inflating: Dataset_kaggle/COVID/Covid (1009).png
  inflating: Dataset_kaggle/COVID/Covid (101).png
  inflating: Dataset_kaggle/COVID/Covid (1010).png
  inflating: Dataset_kaggle/COVID/Covid (1011).png
```

In [2]:

```
!pip install split_folders
```

```
Collecting split_folders
  Downloading https://files.pythonhosted.org/packages/20/67/29dda743e6d23ac1ea3
d16704d8bbb48d65faf3f1b1eaf53153b3da56c56/split_folders-0.3.1-py3-none-any.whl
 (https://files.pythonhosted.org/packages/20/67/29dda743e6d23ac1ea3d16704d8bbb4
8d65faf3f1b1eaf53153b3da56c56/split_folders-0.3.1-py3-none-any.whl)
Installing collected packages: split-folders
Successfully installed split-folders-0.3.1
```

In [3]:

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

```
Copying files: 2481 files [00:01, 2361.05 files/s]
```

In [8]:
```
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.vgg19 import VGG19
from tensorflow.keras.preprocessing import image
from tensorflow.keras.applications.vgg19 import preprocess_input
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.models import Model
from tensorflow.keras.optimizers import Adam

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

vgg = VGG19(input_shape= image_size+[3],weights='imagenet',include_top=False)

x = vgg.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 = vgg.input,outputs=preds)

for layer in vgg.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', # thi
                                                  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=20)
```

```
Found 1984 images belonging to 2 classes.
Found 497 images belonging to 2 classes.
1984
32
23
Epoch 1/20
62/62 [==============================] - 27s 443ms/step - loss: 0.6567 - accura
cy: 0.7923 - val_loss: 0.2820 - val_accuracy: 0.8873
Epoch 2/20
62/62 [==============================] - 27s 439ms/step - loss: 0.1804 - accura
cy: 0.9299 - val_loss: 0.2010 - val_accuracy: 0.9074
Epoch 3/20
62/62 [==============================] - 27s 440ms/step - loss: 0.1246 - accura
cy: 0.9587 - val_loss: 0.3170 - val_accuracy: 0.8913
Epoch 4/20
62/62 [==============================] - 27s 439ms/step - loss: 0.1465 - accura
cy: 0.9496 - val_loss: 0.1977 - val_accuracy: 0.9235
Epoch 5/20
62/62 [==============================] - 27s 440ms/step - loss: 0.0777 - accura
cy: 0.9753 - val_loss: 0.1123 - val_accuracy: 0.9517
Epoch 6/20
62/62 [==============================] - 27s 439ms/step - loss: 0.0421 - accura
cy: 0.9844 - val_loss: 0.1915 - val_accuracy: 0.9276
Epoch 7/20
62/62 [==============================] - 27s 439ms/step - loss: 0.0666 - accura
cy: 0.9733 - val_loss: 0.2059 - val_accuracy: 0.9256
Epoch 8/20
62/62 [==============================] - 27s 438ms/step - loss: 0.0751 - accura
cy: 0.9708 - val_loss: 0.1478 - val_accuracy: 0.9497
Epoch 9/20
62/62 [==============================] - 27s 439ms/step - loss: 0.0262 - accura
cy: 0.9919 - val_loss: 0.3220 - val_accuracy: 0.9195
Epoch 10/20
62/62 [==============================] - 27s 440ms/step - loss: 0.0542 - accura
cy: 0.9808 - val_loss: 0.4529 - val_accuracy: 0.8753
Epoch 11/20
62/62 [==============================] - 27s 440ms/step - loss: 0.0684 - accura
cy: 0.9768 - val_loss: 0.1498 - val_accuracy: 0.9557
Epoch 12/20
62/62 [==============================] - 27s 439ms/step - loss: 0.0292 - accura
cy: 0.9894 - val_loss: 0.1369 - val_accuracy: 0.9618
Epoch 13/20
62/62 [==============================] - 27s 441ms/step - loss: 0.0146 - accura
cy: 0.9965 - val_loss: 0.1994 - val_accuracy: 0.9577
Epoch 14/20
62/62 [==============================] - 27s 439ms/step - loss: 8.6756e-04 - ac
curacy: 1.0000 - val_loss: 0.1751 - val_accuracy: 0.9678
Epoch 15/20
62/62 [==============================] - 27s 438ms/step - loss: 9.8445e-05 - ac
curacy: 1.0000 - val_loss: 0.1824 - val_accuracy: 0.9678
```

```
Epoch 16/20
62/62 [==============================] - 27s 438ms/step - loss: 2.3903e-05 - ac
curacy: 1.0000 - val_loss: 0.1867 - val_accuracy: 0.9698
Epoch 17/20
62/62 [==============================] - 27s 439ms/step - loss: 1.4151e-05 - ac
curacy: 1.0000 - val_loss: 0.1917 - val_accuracy: 0.9698
Epoch 18/20
62/62 [==============================] - 27s 439ms/step - loss: 8.7185e-06 - ac
curacy: 1.0000 - val_loss: 0.2002 - val_accuracy: 0.9698
Epoch 19/20
62/62 [==============================] - 27s 440ms/step - loss: 5.2250e-06 - ac
curacy: 1.0000 - val_loss: 0.2080 - val_accuracy: 0.9698
Epoch 20/20
62/62 [==============================] - 27s 440ms/step - loss: 3.3937e-06 - ac
curacy: 1.0000 - val_loss: 0.2136 - val_accuracy: 0.9698
```

In [9]:
```
acc=model.evaluate_generator(test_generator)
print(acc[1])
```

```
0.9698188900947571
```

In [5]:
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