```
from google.colab import drive
drive.mount('/content/drive/')
```

```
Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?client_id=947318

Enter your authorization code:
··········
Mounted at /content/drive/
```

```
!pip install -q keras
```

```
import keras
```

```
Using TensorFlow backend.
```

```
from keras.models import Sequential
from keras.layers import Dense
from keras.layers import Convolution2D
from keras.layers import MaxPooling2D
from keras.layers import Flatten
```

```
from keras.preprocessing.image import ImageDataGenerator
train_datagen = ImageDataGenerator(rescale = 1./255,shear_range = 0.2,zoom_range = 0.2,horizo
test_datagen = ImageDataGenerator(rescale = 1./255)
```

```
x_train = train_datagen.flow_from_directory(r'/content/drive/My Drive/Pneumonia prediction/tr
x_test = test_datagen.flow_from_directory(r'/content/drive/My Drive/Pneumonia prediction/test
```

```
Found 190 images belonging to 2 classes.
Found 85 images belonging to 2 classes.
```

```
print(x_train.class_indices)
```

```
{'train set-normal': 0, 'train set-pneumonia': 1}
```

```
model = Sequential()
```

```
model.add(Convolution2D(32,(3,3), input_shape = (64,64,3),activation = "relu"))
```

```
model.add(MaxPooling2D(pool_size = (2,2)))
```

```
model.add(Flatten())
```

```
model.add(Dense(units = 128,init = "random_uniform",activation = "relu"))
```

```
/usr/local/lib/python3.6/dist-packages/ipykernel_launcher.py:1: UserWarning: Update your
  """Entry point for launching an IPython kernel.
```

```
model.add(Dense(units =2,init = "random_uniform",activation = "softmax"))
```

```
/usr/local/lib/python3.6/dist-packages/ipykernel_launcher.py:1: UserWarning: Update your
  """Entry point for launching an IPython kernel.
```

```
model.compile(loss = "categorical_crossentropy",optimizer = "adam",metrics = ["accuracy"])
```

```
model.fit_generator(x_train , steps_per_epoch =  6 , epochs = 100, validation_data = x_test,
```

```
Epoch 1/100
6/6 [==============================] - 106s 18s/step - loss: 0.8331 - accuracy: 0.5053 -
Epoch 2/100
6/6 [==============================] - 4s 697ms/step - loss: 0.6817 - accuracy: 0.5368 -
Epoch 3/100
6/6 [==============================] - 4s 694ms/step - loss: 0.6648 - accuracy: 0.5211 -
Epoch 4/100
6/6 [==============================] - 4s 700ms/step - loss: 0.6379 - accuracy: 0.6632 -
Epoch 5/100
6/6 [==============================] - 4s 680ms/step - loss: 0.6246 - accuracy: 0.7158 -
Epoch 6/100
6/6 [==============================] - 4s 699ms/step - loss: 0.5880 - accuracy: 0.7474 -
Epoch 7/100
6/6 [==============================] - 4s 710ms/step - loss: 0.5017 - accuracy: 0.8421 -
Epoch 8/100
6/6 [==============================] - 4s 692ms/step - loss: 0.4838 - accuracy: 0.7842 -
Epoch 9/100
6/6 [==============================] - 4s 697ms/step - loss: 0.4283 - accuracy: 0.8421 -
Epoch 10/100
6/6 [==============================] - 4s 695ms/step - loss: 0.3504 - accuracy: 0.8737 -
Epoch 11/100
6/6 [==============================] - 4s 699ms/step - loss: 0.3412 - accuracy: 0.8737 -
Epoch 12/100
6/6 [==============================] - 4s 693ms/step - loss: 0.2938 - accuracy: 0.8737 -
Epoch 13/100
6/6 [==============================] - 4s 703ms/step - loss: 0.3446 - accuracy: 0.8421 -
Epoch 14/100
6/6 [==============================] - 4s 691ms/step - loss: 0.3008 - accuracy: 0.8632 -
Epoch 15/100
6/6 [==============================] - 4s 712ms/step - loss: 0.2744 - accuracy: 0.9211 -
Epoch 16/100
6/6 [==============================] - 4s 697ms/step - loss: 0.3354 - accuracy: 0.8737 -
Epoch 17/100
6/6 [==============================] - 4s 697ms/step - loss: 0.2342 - accuracy: 0.9105 -
Epoch 18/100
6/6 [==============================] - 4s 692ms/step - loss: 0.2327 - accuracy: 0.9053 -
Epoch 19/100
6/6 [==============================] - 4s 695ms/step - loss: 0.2337 - accuracy: 0.9105 -
Epoch 20/100
6/6 [==============================] - 4s 700ms/step - loss: 0.2882 - accuracy: 0.8737 -
Epoch 21/100
6/6 [==============================] - 4s 695ms/step - loss: 0.2460 - accuracy: 0.8947 -
Epoch 22/100
6/6 [==============================] - 4s 695ms/step - loss: 0.1835 - accuracy: 0.9421 -
Epoch 23/100
6/6 [==============================] - 4s 701ms/step - loss: 0.2188 - accuracy: 0.9105 -
Epoch 24/100
6/6 [==============================] - 4s 701ms/step - loss: 0.2280 - accuracy: 0.9000 -
Epoch 25/100
6/6 [==============================] - 4s 697ms/step - loss: 0.2494 - accuracy: 0.9000 -
Epoch 26/100
6/6 [==============================] - 4s 693ms/step - loss: 0.2435 - accuracy: 0.9000 -
Epoch 27/100
6/6 [==============================] - 4s 687ms/step - loss: 0.2509 - accuracy: 0.9105 -
Epoch 28/100
6/6 [==============================] - 4s 697ms/step - loss: 0.2630 - accuracy: 0.8842 -
Epoch 29/100
```

```
6/6 [==============================] - 4s 698ms/step - loss: 0.2218 - accuracy: 0.9158 -
Epoch 30/100
6/6 [==============================] - 4s 697ms/step - loss: 0.2173 - accuracy: 0.9211 -
Epoch 31/100
6/6 [==============================] - 4s 691ms/step - loss: 0.1789 - accuracy: 0.9316 -
Epoch 32/100
6/6 [==============================] - 4s 694ms/step - loss: 0.1683 - accuracy: 0.9421 -
Epoch 33/100
6/6 [==============================] - 4s 702ms/step - loss: 0.1371 - accuracy: 0.9579 -
Epoch 34/100
6/6 [==============================] - 4s 694ms/step - loss: 0.1456 - accuracy: 0.9474 -
Epoch 35/100
6/6 [==============================] - 4s 695ms/step - loss: 0.1597 - accuracy: 0.9316 -
Epoch 36/100
6/6 [==============================] - 4s 703ms/step - loss: 0.1999 - accuracy: 0.9211 -
Epoch 37/100
6/6 [==============================] - 4s 690ms/step - loss: 0.1531 - accuracy: 0.9526 -
Epoch 38/100
6/6 [==============================] - 4s 699ms/step - loss: 0.1870 - accuracy: 0.9316 -
Epoch 39/100
6/6 [==============================] - 4s 698ms/step - loss: 0.1600 - accuracy: 0.9316 -
Epoch 40/100
6/6 [==============================] - 4s 702ms/step - loss: 0.1714 - accuracy: 0.9684 -
Epoch 41/100
6/6 [==============================] - 4s 700ms/step - loss: 0.1354 - accuracy: 0.9474 -
Epoch 42/100
6/6 [==============================] - 4s 703ms/step - loss: 0.1549 - accuracy: 0.9263 -
Epoch 43/100
6/6 [==============================] - 4s 711ms/step - loss: 0.1571 - accuracy: 0.9421 -
Epoch 44/100
6/6 [==============================] - 4s 695ms/step - loss: 0.2038 - accuracy: 0.9158 -
Epoch 45/100
6/6 [==============================] - 4s 693ms/step - loss: 0.2519 - accuracy: 0.8947 -
Epoch 46/100
6/6 [==============================] - 4s 705ms/step - loss: 0.1705 - accuracy: 0.9368 -
Epoch 47/100
6/6 [==============================] - 4s 698ms/step - loss: 0.1631 - accuracy: 0.9368 -
Epoch 48/100
6/6 [==============================] - 4s 712ms/step - loss: 0.1782 - accuracy: 0.9368 -
Epoch 49/100
6/6 [==============================] - 4s 701ms/step - loss: 0.1886 - accuracy: 0.9263 -
Epoch 50/100
6/6 [==============================] - 4s 705ms/step - loss: 0.1928 - accuracy: 0.9263 -
Epoch 51/100
6/6 [==============================] - 4s 701ms/step - loss: 0.1531 - accuracy: 0.9368 -
Epoch 52/100
6/6 [==============================] - 4s 696ms/step - loss: 0.1509 - accuracy: 0.9474 -
Epoch 53/100
6/6 [==============================] - 4s 702ms/step - loss: 0.1254 - accuracy: 0.9632 -
Epoch 54/100
6/6 [==============================] - 4s 700ms/step - loss: 0.1187 - accuracy: 0.9526 -
Epoch 55/100
6/6 [==============================] - 4s 703ms/step - loss: 0.1187 - accuracy: 0.9684 -
Epoch 56/100
6/6 [==============================] - 4s 692ms/step - loss: 0.1364 - accuracy: 0.9632 -
Epoch 57/100
6/6 [==============================] - 4s 700ms/step - loss: 0.1391 - accuracy: 0.9474 -
Epoch 58/100
```

```
6/6 [==============================] - 4s 702ms/step - loss: 0.2119 - accuracy: 0.9211 -
Epoch 59/100
6/6 [==============================] - 4s 697ms/step - loss: 0.2109 - accuracy: 0.9105 -
Epoch 60/100
6/6 [==============================] - 4s 713ms/step - loss: 0.1607 - accuracy: 0.9474 -
Epoch 61/100
6/6 [==============================] - 4s 721ms/step - loss: 0.1243 - accuracy: 0.9474 -
Epoch 62/100
6/6 [==============================] - 4s 699ms/step - loss: 0.1241 - accuracy: 0.9421 -
Epoch 63/100
6/6 [==============================] - 4s 688ms/step - loss: 0.1046 - accuracy: 0.9737 -
Epoch 64/100
6/6 [==============================] - 4s 706ms/step - loss: 0.0945 - accuracy: 0.9684 -
Epoch 65/100
6/6 [==============================] - 4s 704ms/step - loss: 0.1038 - accuracy: 0.9632 -
Epoch 66/100
6/6 [==============================] - 4s 703ms/step - loss: 0.0785 - accuracy: 0.9737 -
Epoch 67/100
6/6 [==============================] - 4s 705ms/step - loss: 0.0807 - accuracy: 0.9737 -
Epoch 68/100
6/6 [==============================] - 4s 699ms/step - loss: 0.0977 - accuracy: 0.9684 -
Epoch 69/100
6/6 [==============================] - 4s 714ms/step - loss: 0.0878 - accuracy: 0.9737 -
Epoch 70/100
6/6 [==============================] - 4s 704ms/step - loss: 0.1467 - accuracy: 0.9316 -
Epoch 71/100
6/6 [==============================] - 4s 705ms/step - loss: 0.2021 - accuracy: 0.8947 -
Epoch 72/100
6/6 [==============================] - 4s 706ms/step - loss: 0.1953 - accuracy: 0.9105 -
Epoch 73/100
6/6 [==============================] - 4s 708ms/step - loss: 0.1607 - accuracy: 0.9474 -
Epoch 74/100
6/6 [==============================] - 4s 706ms/step - loss: 0.0981 - accuracy: 0.9684 -
Epoch 75/100
6/6 [==============================] - 4s 701ms/step - loss: 0.1459 - accuracy: 0.9368 -
Epoch 76/100
6/6 [==============================] - 4s 697ms/step - loss: 0.1413 - accuracy: 0.9474 -
Epoch 77/100
6/6 [==============================] - 4s 705ms/step - loss: 0.1076 - accuracy: 0.9632 -
Epoch 78/100
6/6 [==============================] - 4s 698ms/step - loss: 0.0996 - accuracy: 0.9737 -
Epoch 79/100
6/6 [==============================] - 4s 708ms/step - loss: 0.0837 - accuracy: 0.9737 -
Epoch 80/100
6/6 [==============================] - 4s 699ms/step - loss: 0.0530 - accuracy: 0.9842 -
Epoch 81/100
6/6 [==============================] - 4s 706ms/step - loss: 0.0826 - accuracy: 0.9737 -
Epoch 82/100
```

```
model.save('mymodel.h5')
```

```
6/6 [==============================] - 4s 703ms/step - loss: 0.1642 - accuracy: 0.9316 -
```

```
from keras.models import load_model
import numpy as np
import cv2
model =load_model('mymodel.h5')
```

```
6/6 [==============================] - 4s 693ms/step - loss: 0.0737 - accuracy: 0.9842 -
```

```
model.compile(loss = "categorical_crossentropy",optimizer = "adam",metrics = ["accuracy"])
```

```
Epoch 88/100
```

```
from skimage.transform import resize
def detect(frame):
    try:
        img= resize(frame,(64,64))
        img = np.expand_dims(img,axis=0)
        if(np.max)(img)>1:
            img =img/255.0
        prediction = model.predict(img)
        print (prediction)
        prediction_class = model.predict_classes(img)
        print(prediction_class)
    except AttributeError:
        print("shape not found")
```

```
6/6 [==============================] - 4s 700ms/step - loss: 0.0492 - accuracy: 0.9843
```

```
frame= cv2.imread(r"/content/drive/My Drive/Pneumonia prediction/pneumonia.jpg")
data= detect(frame)
```

```
[[0.00141206 0.9985879 ]]
[1]
```

```
Epoch 100/100
```