Submitted To - Sameul Otim

Final Project Report

CSIS-4260-002
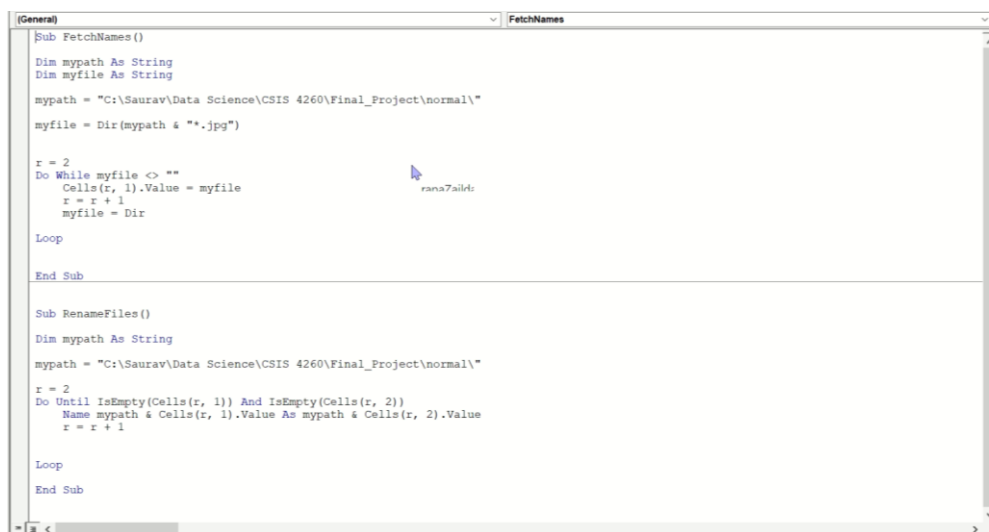
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Background

Coronavirus, also known as COVID-19 is an illness which is caused by a virus that can spread from person to person. The symptoms can range from mild to severe illness. COVID-19 has resulted in countless numbers of lives lost, ruining multiple businesses all over the world and disrupting the global economy.

Challenges

- We had our dataset in 2 different files (csv and image folder).
- Csv had two columns: image id and label (whether the person is COVID positive or not)
- The Image folder had images with id
- With the help of macro in excel, we segregated COVID images from the ones that do not have COVID.

Below is code we used:

```
(General)                                                              FetchNames

Sub FetchNames()

Dim mypath As String
Dim myfile As String

mypath = "C:\Saurav\Data Science\CSIS 4260\Final_Project\normal\"

myfile = Dir(mypath & "*.jpg")

r = 2
Do While myfile <> ""
    Cells(r, 1).Value = myfile              rana7aild:
    r = r + 1
    myfile = Dir

Loop

End Sub


Sub RenameFiles()

Dim mypath As String

mypath = "C:\Saurav\Data Science\CSIS 4260\Final_Project\normal\"

r = 2
Do Until IsEmpty(Cells(r, 1)) And IsEmpty(Cells(r, 2))
    Name mypath & Cells(r, 1).Value As mypath & Cells(r, 2).Value
    r = r + 1

Loop

End Sub
```
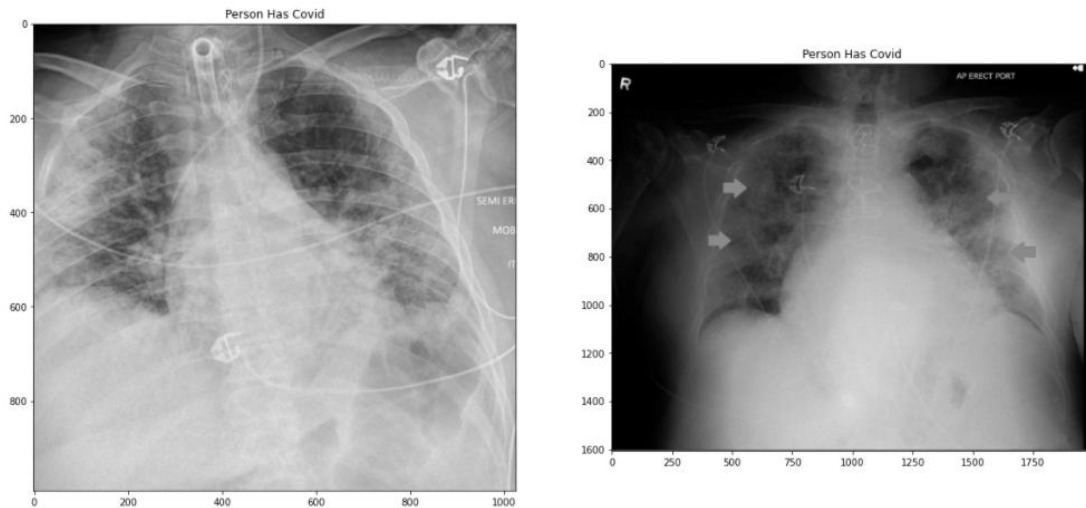
The next challenge was to read the images from the local repository and then reshaped them to plot the figure.

```
imagescv = [cv2.imread(file) for file in glob.glob(os.path.join(DAtADIR, 'covid', '*.jpg'))]
```

```
fig=plt.figure(figsize=(20, 20))
columns = 2
rows = 2
for i in range(1, columns*rows +1):
    img = imagescv[i]
    fig.add_subplot(rows, columns, i)
    plt.title('Person Has Covid')
    plt.imshow(img)
plt.show()
```


Explanation and Prediction

- With the help of image processing tools, we read all the images and put them in an array. According to the challenge listed above, we separated the COVID positive images from the negative ones.

- We reshaped the images.

- After reshaping, we processed the images and analysed them. Since the images were three-dimensional (3D), we converted it into a two-dimensional (2D) array by flattening it.
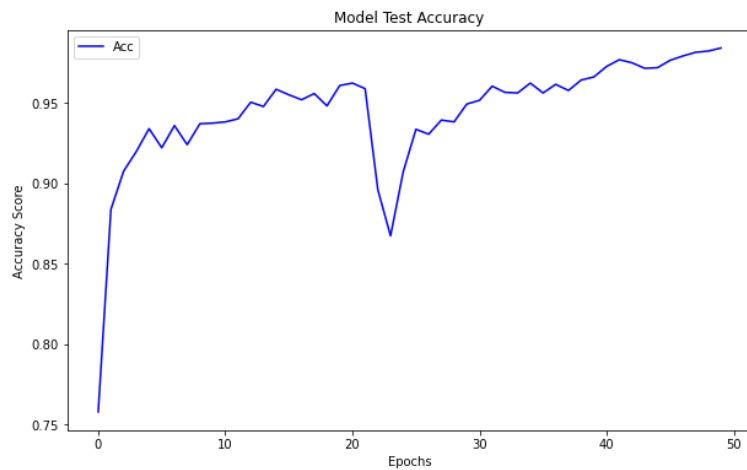
- We then resized it to 200 pixels.

Below are the figures we obtained from the flattening process:

```
fig=plt.figure(figsize=(20, 20))
columns = 2
rows = 2
for i in range(1, columns*rows +1):
    img = imagescv[i]
    fig.add_subplot(rows, columns, i)
    plt.title('Person Has Covid')
    plt.imshow(img)
plt.show()
```
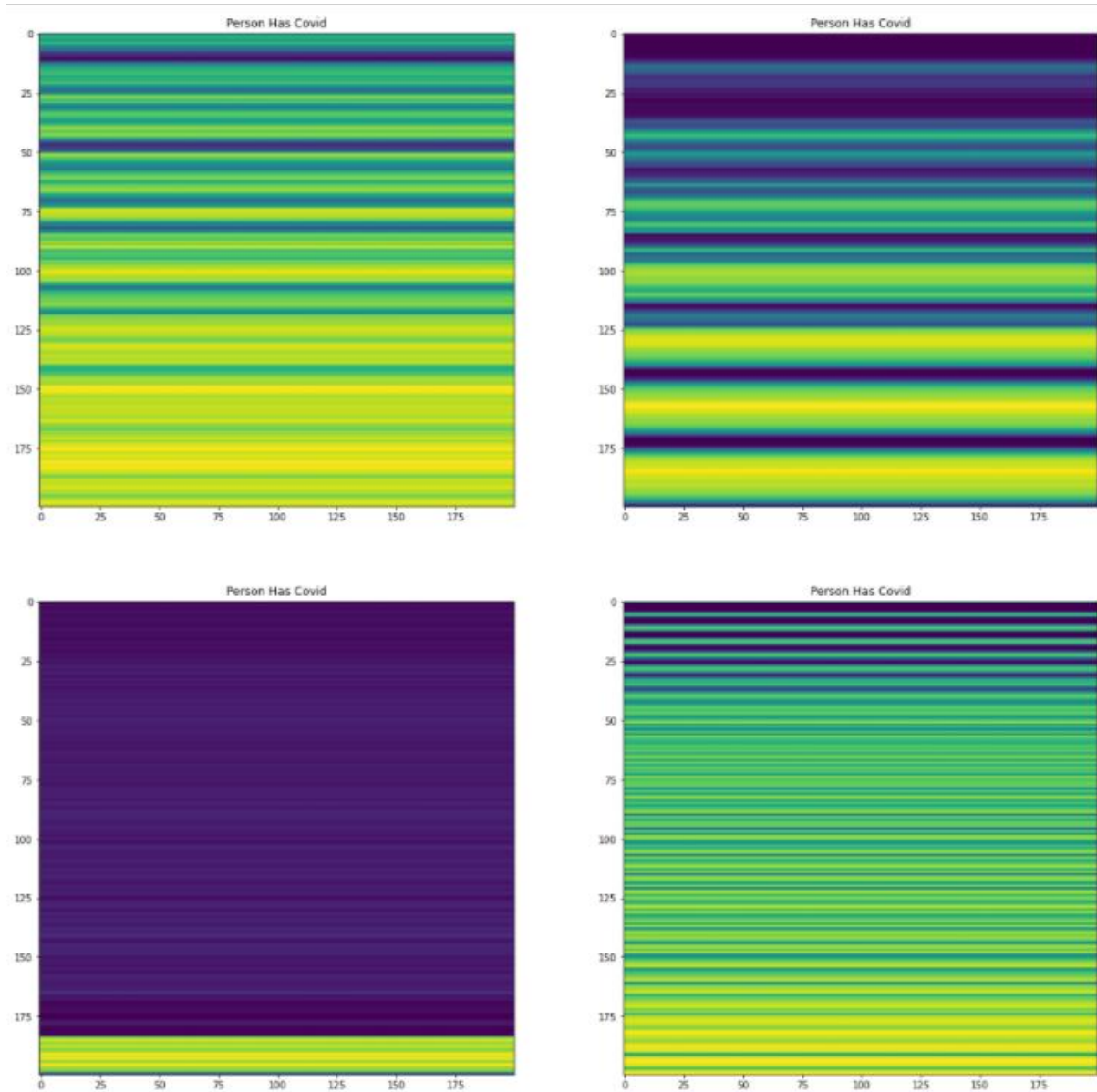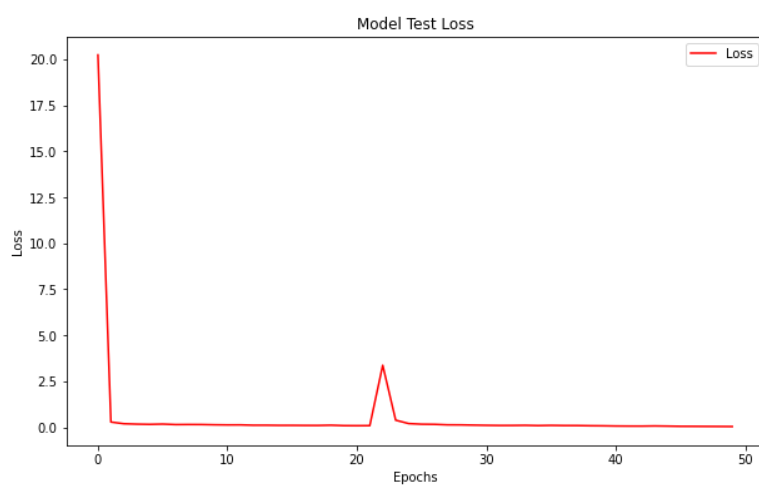
Graphs

The first graph depicts the error in the model.

Model Test Accuracy

The second graph depicts the accuracy of the model.

```
img = X_test[15]

img = img.reshape(1,200, 200, 1)

predictions = model.predict(img)

# Predict the class
result = model.predict_classes(img)

if result == 0:
    print('Person is COVID Positive')
else:
    print('Person is Normal')
```
Person is COVID Positive

- The above snippet of code predicts the COVID status of Image No. 15. It determines whether the person is COVID positive or not.
- By analysing we depict that the patient is suffering from COVID.

Managerial Implications:

We can predict from the chest x-ray of the patient through our prediction model, whether he is COVID positive or not.