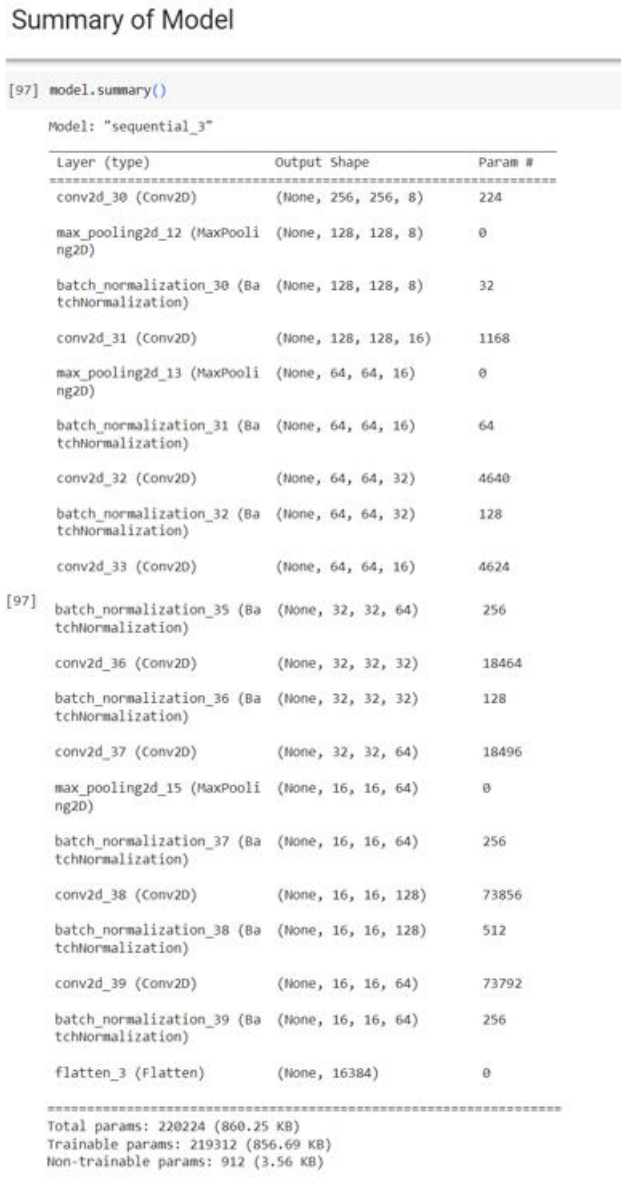
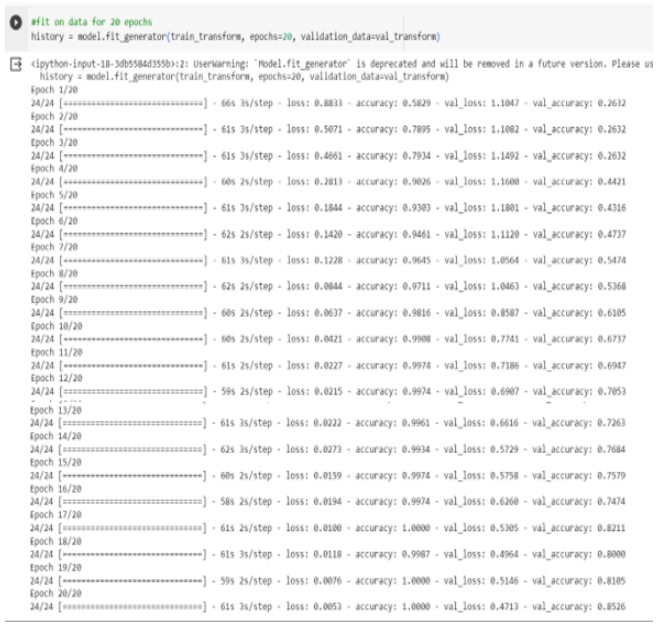
Project Development Phase
Model Performance Test

Date	01 November 2023
Team ID	Team-592696
Project Name	Detecting COVID-19 From Chest X-Rays Using Deep Learning Techniques
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No	Parameter	Values	Screenshot
1.	Model Summary	**Total params: 2,20,224** **Trainable params: 2,19,312** **Non-trainable params: 912**	

2.	Accuracy	**Training Accuracy:1.000** **Val_Accuracy:0.8526**	Fit the model 
3.	Confidence Score (Only Yolo Projects)	Class Detected - NA Confidence Score - NA	Not Applicable

Screenshot:

Summary of Model

```
[97] model.summary()
```

```
Model: "sequential_3"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d_30 (Conv2D)          (None, 256, 256, 8)       224

 max_pooling2d_12 (MaxPooli  (None, 128, 128, 8)       0
 ng2D)

 batch_normalization_30 (Ba  (None, 128, 128, 8)       32
 tchNormalization)

 conv2d_31 (Conv2D)          (None, 128, 128, 16)      1168

 max_pooling2d_13 (MaxPooli  (None, 64, 64, 16)        0
 ng2D)

 batch_normalization_31 (Ba  (None, 64, 64, 16)        64
 tchNormalization)

 conv2d_32 (Conv2D)          (None, 64, 64, 32)        4640

 batch_normalization_32 (Ba  (None, 64, 64, 32)        128
 tchNormalization)

 conv2d_33 (Conv2D)          (None, 64, 64, 16)        4624

[97]
 batch_normalization_35 (Ba  (None, 32, 32, 64)        256
 tchNormalization)

 conv2d_36 (Conv2D)          (None, 32, 32, 32)        18464

 batch_normalization_36 (Ba  (None, 32, 32, 32)        128
 tchNormalization)

 conv2d_37 (Conv2D)          (None, 32, 32, 64)        18496

 max_pooling2d_15 (MaxPooli  (None, 16, 16, 64)        0
 ng2D)

 batch_normalization_37 (Ba  (None, 16, 16, 64)        256
 tchNormalization)

 conv2d_38 (Conv2D)          (None, 16, 16, 128)       73856

 batch_normalization_38 (Ba  (None, 16, 16, 128)       512
 tchNormalization)

 conv2d_39 (Conv2D)          (None, 16, 16, 64)        73792

 batch_normalization_39 (Ba  (None, 16, 16, 64)        256
 tchNormalization)

 flatten_3 (Flatten)         (None, 16384)             0

=================================================================
Total params: 220224 (860.25 KB)
Trainable params: 219312 (856.69 KB)
Non-trainable params: 912 (3.56 KB)
```

Accuracy

Fit the model

```
#fit on data for 20 epochs
history = model.fit_generator(train_transform, epochs=20, validation_data=val_transform)
```

```
<ipython-input-18-3db5584d355b>:2: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which
  history = model.fit_generator(train_transform, epochs=20, validation_data=val_transform)
Epoch 1/20
24/24 [==============================] - 66s 3s/step - loss: 0.8833 - accuracy: 0.5829 - val_loss: 1.1047 - val_accuracy: 0.2632
Epoch 2/20
24/24 [==============================] - 61s 3s/step - loss: 0.5071 - accuracy: 0.7895 - val_loss: 1.1082 - val_accuracy: 0.2632
Epoch 3/20
24/24 [==============================] - 61s 3s/step - loss: 0.4661 - accuracy: 0.7934 - val_loss: 1.1492 - val_accuracy: 0.2632
Epoch 4/20
24/24 [==============================] - 60s 2s/step - loss: 0.2813 - accuracy: 0.9026 - val_loss: 1.1600 - val_accuracy: 0.4421
Epoch 5/20
24/24 [==============================] - 61s 3s/step - loss: 0.1844 - accuracy: 0.9303 - val_loss: 1.1801 - val_accuracy: 0.4316
Epoch 6/20
24/24 [==============================] - 62s 2s/step - loss: 0.1420 - accuracy: 0.9461 - val_loss: 1.1120 - val_accuracy: 0.4737
Epoch 7/20
24/24 [==============================] - 61s 3s/step - loss: 0.1228 - accuracy: 0.9645 - val_loss: 1.0564 - val_accuracy: 0.5474
Epoch 8/20
24/24 [==============================] - 62s 2s/step - loss: 0.0844 - accuracy: 0.9711 - val_loss: 1.0463 - val_accuracy: 0.5368
Epoch 9/20
24/24 [==============================] - 60s 2s/step - loss: 0.0637 - accuracy: 0.9816 - val_loss: 0.8587 - val_accuracy: 0.6105
Epoch 10/20
24/24 [==============================] - 60s 2s/step - loss: 0.0421 - accuracy: 0.9908 - val_loss: 0.7741 - val_accuracy: 0.6737
Epoch 11/20
24/24 [==============================] - 61s 2s/step - loss: 0.0227 - accuracy: 0.9974 - val_loss: 0.7186 - val_accuracy: 0.6947
Epoch 12/20
24/24 [==============================] - 59s 2s/step - loss: 0.0215 - accuracy: 0.9974 - val_loss: 0.6907 - val_accuracy: 0.7053
Epoch 13/20
24/24 [==============================] - 61s 3s/step - loss: 0.0222 - accuracy: 0.9961 - val_loss: 0.6616 - val_accuracy: 0.7263
Epoch 14/20
24/24 [==============================] - 62s 3s/step - loss: 0.0273 - accuracy: 0.9934 - val_loss: 0.5729 - val_accuracy: 0.7684
Epoch 15/20
24/24 [==============================] - 60s 2s/step - loss: 0.0159 - accuracy: 0.9974 - val_loss: 0.5758 - val_accuracy: 0.7579
Epoch 16/20
24/24 [==============================] - 58s 2s/step - loss: 0.0194 - accuracy: 0.9974 - val_loss: 0.6260 - val_accuracy: 0.7474
Epoch 17/20
24/24 [==============================] - 61s 2s/step - loss: 0.0100 - accuracy: 1.0000 - val_loss: 0.5305 - val_accuracy: 0.8211
Epoch 18/20
24/24 [==============================] - 61s 3s/step - loss: 0.0118 - accuracy: 0.9987 - val_loss: 0.4964 - val_accuracy: 0.8000
Epoch 19/20
24/24 [==============================] - 59s 2s/step - loss: 0.0076 - accuracy: 1.0000 - val_loss: 0.5146 - val_accuracy: 0.8105
Epoch 20/20
24/24 [==============================] - 61s 3s/step - loss: 0.0053 - accuracy: 1.0000 - val_loss: 0.4713 - val_accuracy: 0.8526
```