Project Development Phase
Model Performance Test

Team ID	**PNT2022TMID03824**
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	10 Marks

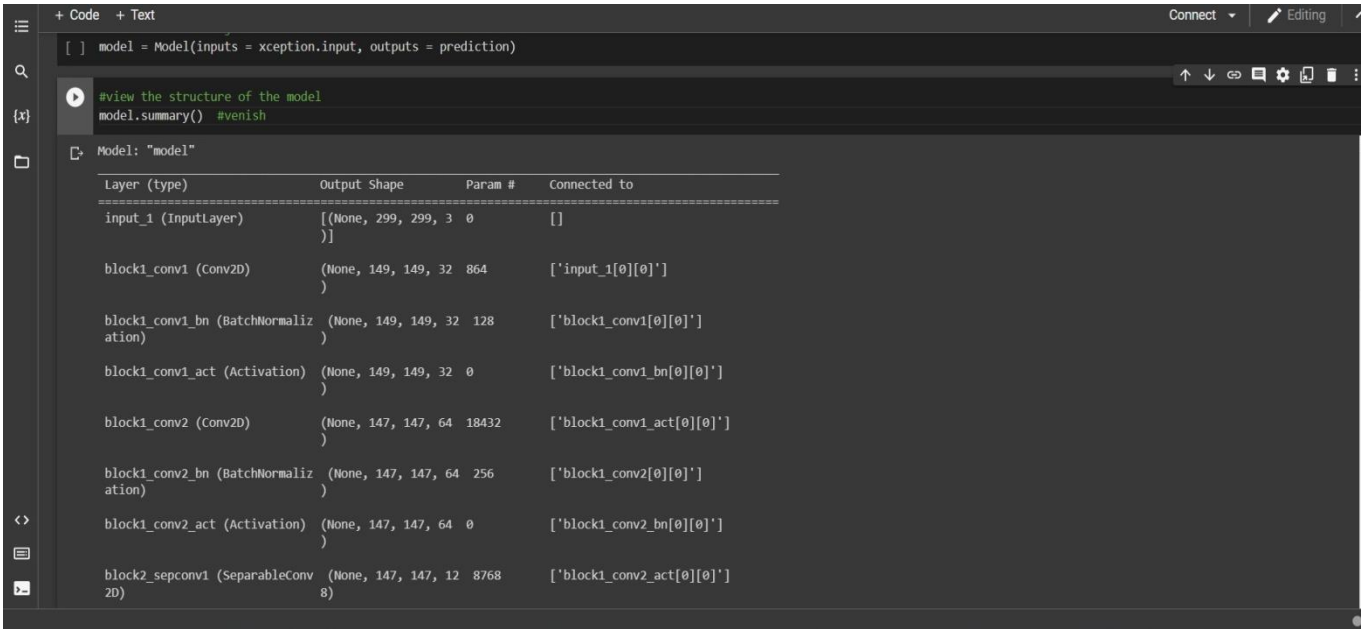
Model Performance Testing:

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

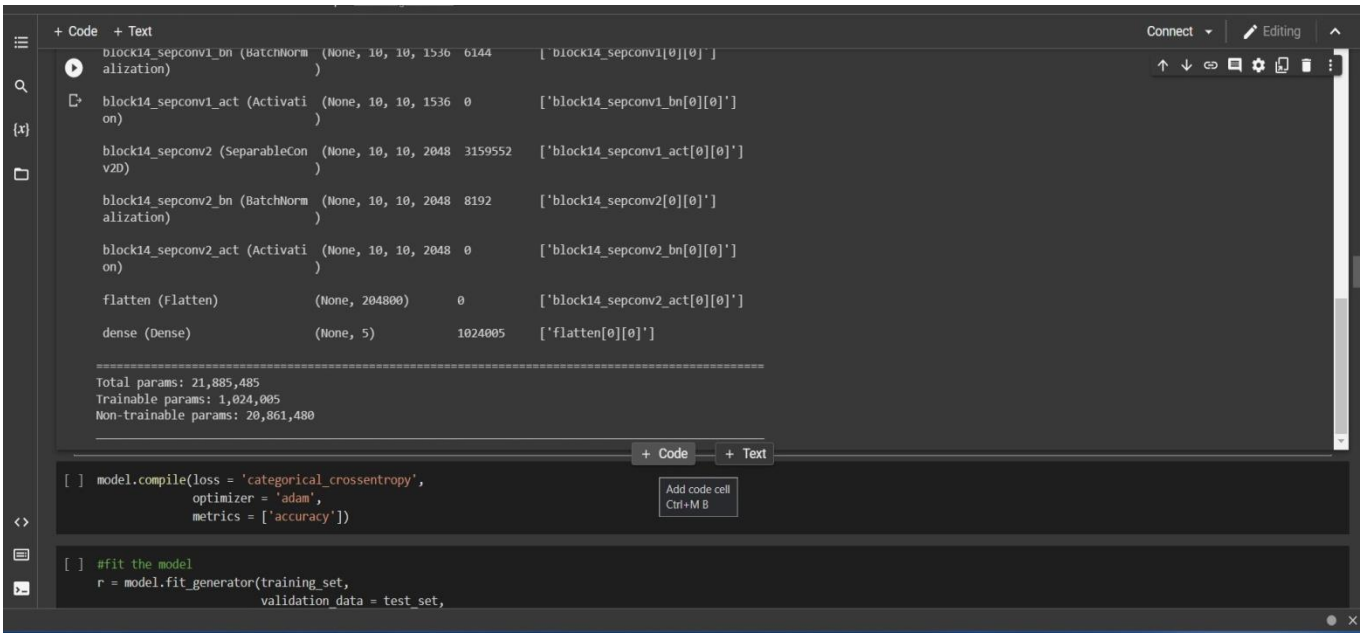
S.No.	Parameter	Values	Screenshot
1.	Model Summary	Total params: 21,885,485 Trainable params: 1,024,005 Non-trainable params: 20,861,480	Attached below
2.	Accuracy	Training Accuracy - 75% Validation Accuracy - 60%	Attached below
3.	Confidence Score (Only Yolo Projects)	Class Detected - NILL Confidence Score - NILL	NILL

SCREENSHOTS :

MODEL SUMMARY :



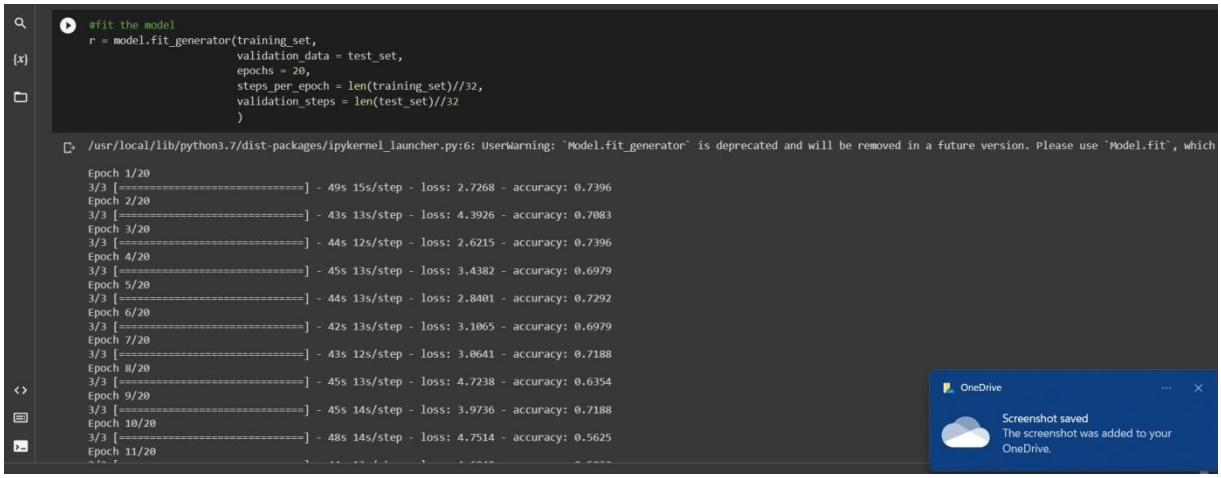
```
[ ] model = Model(inputs = xception.input, outputs = prediction)

#view the structure of the model
model.summary()  #venish

Model: "model"
__________________________________________________________________________________________________
 Layer (type)                   Output Shape         Param #     Connected to
==================================================================================================
 input_1 (InputLayer)           [(None, 299, 299, 3  0           []
                                )]

 block1_conv1 (Conv2D)          (None, 149, 149, 32  864         ['input_1[0][0]']
                                )

 block1_conv1_bn (BatchNormaliz  (None, 149, 149, 32  128        ['block1_conv1[0][0]']
 ation)                         )

 block1_conv1_act (Activation)  (None, 149, 149, 32  0           ['block1_conv1_bn[0][0]']
                                )

 block1_conv2 (Conv2D)          (None, 147, 147, 64  18432       ['block1_conv1_act[0][0]']
                                )

 block1_conv2_bn (BatchNormaliz  (None, 147, 147, 64  256        ['block1_conv2[0][0]']
 ation)                         )

 block1_conv2_act (Activation)  (None, 147, 147, 64  0           ['block1_conv2_bn[0][0]']
                                )

 block2_sepconv1 (SeparableConv  (None, 147, 147, 12  8768       ['block1_conv2_act[0][0]']
 2D)                            8)
```



```
 block14_sepconv1_bn (BatchNorm  (None, 10, 10, 1536  6144       ['block14_sepconv1[0][0]']
 alization)                     )

 block14_sepconv1_act (Activati  (None, 10, 10, 1536  0          ['block14_sepconv1_bn[0][0]']
 on)                            )

 block14_sepconv2 (SeparableCon  (None, 10, 10, 2048  3159552    ['block14_sepconv1_act[0][0]']
 v2D)                           )

 block14_sepconv2_bn (BatchNorm  (None, 10, 10, 2048  8192       ['block14_sepconv2[0][0]']
 alization)                     )

 block14_sepconv2_act (Activati  (None, 10, 10, 2048  0          ['block14_sepconv2_bn[0][0]']
 on)                            )

 flatten (Flatten)              (None, 204800)       0          ['block14_sepconv2_act[0][0]']

 dense (Dense)                  (None, 5)            1024005    ['flatten[0][0]']

==================================================================================================
Total params: 21,885,485
Trainable params: 1,024,005
Non-trainable params: 20,861,480
__________________________________________________________________________________________________

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

[ ] #fit the model
    r = model.fit_generator(training_set,
                            validation_data = test_set,
```

ACCURACY :

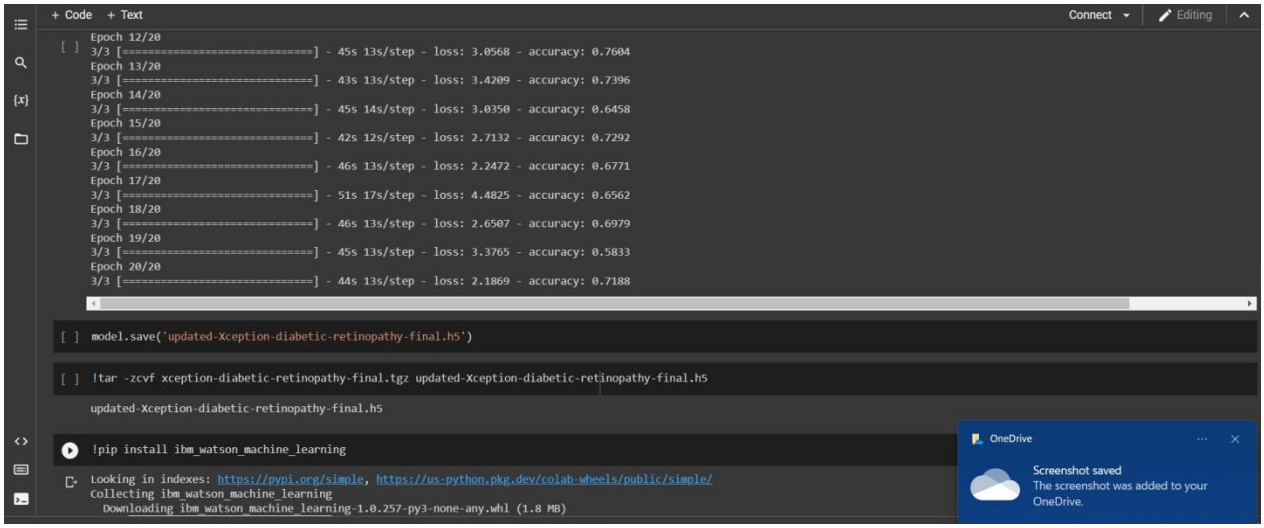
VALIDATION ACCURACY :



```
#fit the model
r = model.fit_generator(training_set,
                        validation_data = test_set,
                        epochs = 20,
                        steps_per_epoch = len(training_set)//32,
                        validation_steps = len(test_set)//32
                        )
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:6: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which

Epoch 1/20
3/3 [==============================] - 49s 15s/step - loss: 2.7268 - accuracy: 0.7396
Epoch 2/20
3/3 [==============================] - 43s 13s/step - loss: 4.3926 - accuracy: 0.7083
Epoch 3/20
3/3 [==============================] - 44s 12s/step - loss: 2.6215 - accuracy: 0.7396
Epoch 4/20
3/3 [==============================] - 45s 13s/step - loss: 3.4382 - accuracy: 0.6979
Epoch 5/20
3/3 [==============================] - 44s 13s/step - loss: 2.8401 - accuracy: 0.7292
Epoch 6/20
3/3 [==============================] - 42s 13s/step - loss: 3.1065 - accuracy: 0.6979
Epoch 7/20
3/3 [==============================] - 43s 12s/step - loss: 3.0641 - accuracy: 0.7188
Epoch 8/20
3/3 [==============================] - 45s 13s/step - loss: 4.7238 - accuracy: 0.6354
Epoch 9/20
3/3 [==============================] - 45s 14s/step - loss: 3.9736 - accuracy: 0.7188
Epoch 10/20
3/3 [==============================] - 48s 14s/step - loss: 4.7514 - accuracy: 0.5625
Epoch 11/20
```

OneDrive
Screenshot saved
The screenshot was added to your OneDrive.



+ Code + Text — Connect — Editing

```
Epoch 12/20
3/3 [==============================] - 45s 13s/step - loss: 3.0568 - accuracy: 0.7604
Epoch 13/20
3/3 [==============================] - 43s 13s/step - loss: 3.4209 - accuracy: 0.7396
Epoch 14/20
3/3 [==============================] - 45s 14s/step - loss: 3.0350 - accuracy: 0.6458
Epoch 15/20
3/3 [==============================] - 42s 12s/step - loss: 2.7132 - accuracy: 0.7292
Epoch 16/20
3/3 [==============================] - 46s 13s/step - loss: 2.2472 - accuracy: 0.6771
Epoch 17/20
3/3 [==============================] - 51s 17s/step - loss: 4.4825 - accuracy: 0.6562
Epoch 18/20
3/3 [==============================] - 46s 13s/step - loss: 2.6507 - accuracy: 0.6979
Epoch 19/20
3/3 [==============================] - 45s 13s/step - loss: 3.3765 - accuracy: 0.5833
Epoch 20/20
3/3 [==============================] - 44s 13s/step - loss: 2.1869 - accuracy: 0.7188
```

```
[ ] model.save('updated-Xception-diabetic-retinopathy-final.h5')
```

```
[ ] !tar -zcvf xception-diabetic-retinopathy-final.tgz updated-Xception-diabetic-retinopathy-final.h5

updated-Xception-diabetic-retinopathy-final.h5
```

```
!pip install ibm_watson_machine_learning

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting ibm_watson_machine_learning
  Downloading ibm_watson_machine_learning-1.0.257-py3-none-any.whl (1.8 MB)
```

OneDrive
Screenshot saved
The screenshot was added to your OneDrive.