Project Development Phase
Model Performance Test

Date	19 November 2023
Team ID	Team 591668
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: 21885485 (83.49 MB)** **Trainable params: 1024005 (3.91 MB)** **Non-trainable params: 20861480 (79.58 MB)**	

```
block7_sepconv2_bn (BatchN  (None, 19, 19, 728)    2912    ['block7_sepconv2[0][0]']
ormalization)

block7_sepconv2_act (Activ  (None, 19, 19, 728)    0       ['block7_sepconv2_bn[0][0]']
ation)

block7_sepconv3 (Separable  (None, 19, 19, 728)    536536  ['block7_sepconv2_act[0][0]']
Conv2D)

block7_sepconv3_bn (BatchN  (None, 19, 19, 728)    2912    ['block7_sepconv3[0][0]']
ormalization)

add_6 (Add)                 (None, 19, 19, 728)    0       ['block7_sepconv3_bn[0][0]',
                                                            'add_6[0][0]']

block8_sepconv1_act (Activ  (None, 19, 19, 728)    0       ['add_5[0][0]']
ation)
```

```
block8_sepconv1_bn (BatchN  (None, 19, 19, 728)    2912    ['block8_sepconv1[0][0]']
ormalization)

block8_sepconv2_act (Activ  (None, 19, 19, 728)    0       ['block8_sepconv1_bn[0][0]']
ation)

block8_sepconv2 (Separable  (None, 19, 19, 728)    536536  ['block8_sepconv2_act[0][0]']
Conv2D)

block8_sepconv2_bn (BatchN  (None, 19, 19, 728)    2912    ['block8_sepconv2[0][0]']
ormalization)

block8_sepconv3_act (Activ  (None, 19, 19, 728)    0       ['block8_sepconv2_bn[0][0]']
ation)

block8_sepconv3 (Separable  (None, 19, 19, 728)    536536  ['block8_sepconv3_act[0][0]']
Conv2D)
```

```
block8_sepconv3_bn (BatchN  (None, 19, 19, 728)    2912    ['block8_sepconv3[0][0]']
ormalization)

add_8 (Add)                 (None, 19, 19, 728)    0       ['block8_sepconv3_bn[0][0]',
                                                            'add_5[0][0]']

block9_sepconv1_act (Activ  (None, 19, 19, 728)    0       ['add_8[0][0]']
ation)

block9_sepconv1 (Separable  (None, 19, 19, 728)    536536  ['block9_sepconv1_act[0][0]']
Conv2D)

block9_sepconv1_bn (BatchN  (None, 19, 19, 728)    2912    ['block9_sepconv1[0][0]']
ormalization)

block9_sepconv2_act (Activ  (None, 19, 19, 728)    0       ['block9_sepconv1_bn[0][0]']
ation)
```

```
block9_sepconv2 (Separable  (None, 19, 19, 728)    536536  ['block9_sepconv2_act[0][0]']
Conv2D)

block9_sepconv2_bn (BatchN  (None, 19, 19, 728)    2912    ['block9_sepconv2[0][0]']
ormalization)

block9_sepconv3_act (Activ  (None, 19, 19, 728)    0       ['block9_sepconv2_bn[0][0]']
ation)

block9_sepconv3 (Separable  (None, 19, 19, 728)    536536  ['block9_sepconv3_act[0][0]']
Conv2D)

block9_sepconv3_bn (BatchN  (None, 19, 19, 728)    2912    ['block9_sepconv3[0][0]']
ormalization)

add_7 (Add)                 (None, 19, 19, 728)    0       ['block9_sepconv3_bn[0][0]',
                                                            'add_6[0][0]']
```

```
block10_sepconv1_act (Acti  (None, 19, 19, 728)    0       ['add_7[0][0]']
vation)

block10_sepconv1 (Separabl  (None, 19, 19, 728)    536536  ['block10_sepconv1_act[0][0]']
eConv2D)

block10_sepconv1_bn (Batch  (None, 19, 19, 728)    2912    ['block10_sepconv1[0][0]']
Normalization)

block10_sepconv2_act (Acti  (None, 19, 19, 728)    0       ['block10_sepconv1_bn[0][0]']
vation)

block10_sepconv2 (Separabl  (None, 19, 19, 728)    536536  ['block10_sepconv2_act[0][0]']
eConv2D)

block10_sepconv2_bn (Batch  (None, 19, 19, 728)    2912    ['block10_sepconv2[0][0]']
Normalization)
```

```
block10_sepconv3_act (Acti  (None, 19, 19, 728)    0       ['block10_sepconv2_bn[0][0]']
vation)

block10_sepconv3 (Separabl  (None, 19, 19, 728)    536536  ['block10_sepconv1_act[0][0]']
eConv2D)

block10_sepconv3_bn (Batch  (None, 19, 19, 728)    2912    ['block10_sepconv3[0][0]']
Normalization)

add_8 (Add)                 (None, 19, 19, 728)    0       ['block10_sepconv3_bn[0][0]',
                                                            'add_7[0][0]']

block11_sepconv1_act (Acti  (None, 19, 19, 728)    0       ['add_8[0][0]']
vation)

block11_sepconv1 (Separabl  (None, 19, 19, 728)    536536  ['block11_sepconv1_act[0][0]']
eConv2D)
```

```
block11_sepconv1_bn (Batch  (None, 19, 19, 728)    2912    ['block11_sepconv1[0][0]']
Normalization)

block11_sepconv2_act (Acti  (None, 19, 19, 728)    0       ['block11_sepconv1_bn[0][0]']
vation)

block11_sepconv2 (Separabl  (None, 19, 19, 728)    536536  ['block11_sepconv2_act[0][0]']
eConv2D)

block11_sepconv2_bn (Batch  (None, 19, 19, 728)    2912    ['block11_sepconv2[0][0]']
Normalization)

block11_sepconv3_act (Acti  (None, 19, 19, 728)    0       ['block11_sepconv2_bn[0][0]']
vation)

block11_sepconv3 (Separabl  (None, 19, 19, 728)    536536  ['block11_sepconv3_act[0][0]']
eConv2D)
```

```
block11_sepconv3_bn (Batch  (None, 19, 19, 728)    2912    ['block11_sepconv3[0][0]']
Normalization)

add_9 (Add)                 (None, 19, 19, 728)    0       ['block11_sepconv3_bn[0][0]',
                                                            'add_8[0][0]']

block12_sepconv1_act (Acti  (None, 19, 19, 728)    0       ['add_9[0][0]']
vation)

block12_sepconv1 (Separabl  (None, 19, 19, 728)    536536  ['block12_sepconv1_act[0][0]']
eConv2D)

block12_sepconv1_bn (Batch  (None, 19, 19, 728)    2912    ['block12_sepconv1[0][0]']
Normalization)

block12_sepconv2_act (Acti  (None, 19, 19, 728)    0       ['block12_sepconv1_bn[0][0]']
vation)

block12_sepconv2 (Separabl  (None, 19, 19, 728)    536536  ['block12_sepconv2_act[0][0]']
```

```
block12_sepconv2_bn (Batch  (None, 19, 19, 728)    2912    ['block12_sepconv2[0][0]']
Normalization)

block12_sepconv3_act (Acti  (None, 19, 19, 728)    0       ['block12_sepconv2_bn[0][0]']
vation)

block12_sepconv3 (Separabl  (None, 19, 19, 728)    536536  ['block12_sepconv3_act[0][0]']
eConv2D)

block12_sepconv3_bn (Batch  (None, 19, 19, 728)    2912    ['block12_sepconv3[0][0]']
Normalization)

add_10 (Add)                (None, 19, 19, 728)    0       ['block12_sepconv3_bn[0][0]',
                                                            'add_9[0][0]']

block13_sepconv1_act (Acti  (None, 19, 19, 728)    0       ['add_10[0][0]']
vation)
```

```
block13_sepconv1 (Separabl  (None, 19, 19, 728)    536536  ['block13_sepconv1_act[0][0]']
eConv2D)

block13_sepconv1_bn (Batch  (None, 19, 19, 728)    2912    ['block13_sepconv1[0][0]']
Normalization)

block13_sepconv2_act (Acti  (None, 19, 19, 728)    0       ['block13_sepconv1_bn[0][0]']
vation)

block13_sepconv2 (Separabl  (None, 19, 19, 1024)   752024  ['block13_sepconv2_act[0][0]']
eConv2D)

block13_sepconv2_bn (Batch  (None, 19, 19, 1024)   4096    ['block13_sepconv2[0][0]']
Normalization)

conv2d_3 (Conv2D)           (None, 10, 10, 1024)   745472  ['add_10[0][0]']

block13_pool (MaxPooling2D  (None, 10, 10, 1024)   0       ['block13_sepconv2_bn[0][0]']
)
```

```
batch_normalization_3 (Bat  (None, 10, 10, 1024)   4096    ['conv2d_3[0][0]']
chNormalization)

add_11 (Add)                (None, 10, 10, 1024)   0       ['block13_pool[0][0]',
                                                            'batch_normalization_3[0][0]'
                                                            ]

block14_sepconv1 (Separabl  (None, 10, 10, 1536)   1582080 ['add_11[0][0]']
eConv2D)

block14_sepconv1_bn (Batch  (None, 10, 10, 1536)   6144    ['block14_sepconv1[0][0]']
Normalization)

block14_sepconv1_act (Acti  (None, 10, 10, 1536)   0       ['block14_sepconv1_bn[0][0]']
vation)

block14_sepconv2 (Separabl  (None, 10, 10, 2048)   3159552 ['block14_sepconv1_act[0][0]']
eConv2D)
```

```
block14_sepconv2_bn (Batch  (None, 10, 10, 2048)   8192    ['block14_sepconv2[0][0]']
Normalization)

block14_sepconv2_act (Acti  (None, 10, 10, 2048)   0       ['block14_sepconv2_bn[0][0]']
vation)

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

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

==================================================================================================
Total params: 21885485 (83.49 MB)
Trainable params: 1024005 (3.91 MB)
Non-trainable params: 20861480 (79.58 MB)
```

| 2. | Accuracy | Training Accuracy - 86.32 Validation Accuracy - 84.74 | <small>Epoch 21/30
115/115 [==============================] - 097s 6s/step - loss: 2.1255 - accuracy: 0.8424 - val_loss: 1.5701 - val_accuracy: 0.0005
Epoch 22/30
115/115 [==============================] - 095s 6s/step - loss: 2.2002 - accuracy: 0.8509 - val_loss: 1.6953 - val_accuracy: 0.0556
Epoch 23/30
115/115 [==============================] - 095s 6s/step - loss: 1.8649 - accuracy: 0.8643 - val_loss: 2.0627 - val_accuracy: 0.0806
Epoch 24/30
115/115 [==============================] - 096s 6s/step - loss: 2.0797 - accuracy: 0.8563 - val_loss: 2.0129 - val_accuracy: 0.0503
Epoch 25/30
115/115 [==============================] - 092s 6s/step - loss: 1.6591 - accuracy: 0.8673 - val_loss: 0.9864 - val_accuracy: 0.1114
Epoch 26/30
115/115 [==============================] - 098s 6s/step - loss: 1.8390 - accuracy: 0.8755 - val_loss: 1.0035 - val_accuracy: 0.0992
Epoch 27/30
115/115 [==============================] - 092s 6s/step - loss: 1.7451 - accuracy: 0.8806 - val_loss: 1.0953 - val_accuracy: 0.0424
Epoch 28/30
115/115 [==============================] - 095s 6s/step - loss: 1.9290 - accuracy: 0.8624 - val_loss: 3.7238 - val_accuracy: 0.9053
Epoch 29/30
115/115 [==============================] - 092s 6s/step - loss: 2.2699 - accuracy: 0.8510 - val_loss: 1.5026 - val_accuracy: 0.0820
Epoch 30/30
115/115 [==============================] - 098s 6s/step - loss: 1.9676 - accuracy: 0.8652 - val_loss: 2.5937 - val_accuracy: 0.0474</small> |
| 3. | Confidence Score (Only Yolo Projects) | Class Detected -

 Confidence Score - | |