TRAINING MODEL ON IBM

```
In [1]:  imageSize = [299,299]
         trainPath = r"E:\GCT\SB4 7\nalaiyathiran\dataset\preprocessed dataset\preprocessed dataset\training"
         testPath = r"E:\GCT\SB4 7\nalaiyathiran\dataset\preprocessed dataset\preprocessed dataset\testing"
```

```
In [2]:  from tensorflow.keras.layers import Dense, Flatten, Input
         from tensorflow.keras.models import Model
         from tensorflow.keras.preprocessing import image
         from tensorflow.keras.preprocessing.image import ImageDataGenerator,load_img
         from tensorflow.keras.applications.xception import Xception,preprocess_input
         from glob import glob
         import numpy as np
         import matplotlib.pyplot as plt
```

```
In [3]:  train_datagen = ImageDataGenerator(rescale=1./255, shear_range = 0.2, zoom_range = 0.2, horizontal_flip = True)
         test_datagen = ImageDataGenerator(rescale = 1./255)
```

```
In [6]:  training_set = train_datagen.flow_from_directory(r"E:\GCT\SB4 7\nalaiyathiran\dataset\preprocessed dataset\preprocessed dataset\training",
                                                          target_size = (299,299),
                                                          batch_size = 32,
                                                          class_mode = 'categorical')
         test_set = test_datagen.flow_from_directory(r"E:\GCT\SB4 7\nalaiyathiran\dataset\preprocessed dataset\preprocessed dataset\training",
                                                     target_size = (299,299),
                                                     batch_size = 32,
                                                     class_mode = 'categorical')

         Found 3662 images belonging to 5 classes.
         Found 3662 images belonging to 5 classes.
```

```
In [7]:  xception=Xception(input_shape = imageSize + [3], weights = 'imagenet', include_top= False)

         Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/xception/xception_weights_tf_dim_ordering_tf_kernels_notop.h5
         83683744/83683744 [==============================] - 82s 1us/step
```

```
In [8]:  for layer in xception.layers:
             layer.trainable = False
```

```
In [9]:  x = Flatten()(xception.output)
```

```
In [10]:  prediction = Dense(5, activation = 'softmax')(x)
```

```
In [11]:  model = Model(inputs=xception.input, outputs=prediction)
```

```
In [12]:  model.summary()
```

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 (BatchNormalization)	(None, 149, 149, 32)	128	['block1_conv1[0][0]']
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 (BatchNormalization)	(None, 147, 147, 64)	256	['block1_conv2[0][0]']
block1_conv2_act (Activation)	(None, 147, 147, 64)	0	['block1_conv2_bn[0][0]']
block2_sepconv1 (SeparableConv2D)	(None, 147, 147, 128)	8768	['block1_conv2_act[0][0]']
block2_sepconv1_bn (BatchNormalization)	(None, 147, 147, 128)	512	['block2_sepconv1[0][0]']
block2_sepconv2_act (Activation)	(None, 147, 147, 128)	0	['block2_sepconv1_bn[0][0]']
block2_sepconv2 (SeparableConv2D)	(None, 147, 147, 128)	17536	['block2_sepconv2_act[0][0]']
block2_sepconv2_bn (BatchNormalization)	(None, 147, 147, 128)	512	['block2_sepconv2[0][0]']

conv2d (Conv2D)	(None, 74, 74, 128)	8192	['block1_conv2_act[0][0]']
block2_pool (MaxPooling2D)	(None, 74, 74, 128)	0	['block2_sepconv2_bn[0][0]']
batch_normalization (BatchNorm alization)	(None, 74, 74, 128)	512	['conv2d[0][0]']
add (Add)	(None, 74, 74, 128)	0	['block2_pool[0][0]', 'batch_normalization[0][0]']
block3_sepconv1_act (Activatio n)	(None, 74, 74, 128)	0	['add[0][0]']
block3_sepconv1 (SeparableConv 2D)	(None, 74, 74, 256)	33920	['block3_sepconv1_act[0][0]']
block3_sepconv1_bn (BatchNorma lization)	(None, 74, 74, 256)	1024	['block3_sepconv1[0][0]']
block3_sepconv2_act (Activatio n)	(None, 74, 74, 256)	0	['block3_sepconv1_bn[0][0]']
block3_sepconv2 (SeparableConv 2D)	(None, 74, 74, 256)	67840	['block3_sepconv2_act[0][0]']
block3_sepconv2_bn (BatchNorma lization)	(None, 74, 74, 256)	1024	['block3_sepconv2[0][0]']
conv2d_1 (Conv2D)	(None, 37, 37, 256)	32768	['add[0][0]']
block3_pool (MaxPooling2D)	(None, 37, 37, 256)	0	['block3_sepconv2_bn[0][0]']
batch_normalization_1 (BatchNo rmalization)	(None, 37, 37, 256)	1024	['conv2d_1[0][0]']
add_1 (Add)	(None, 37, 37, 256)	0	['block3_pool[0][0]', 'batch_normalization_1[0][0]']
block4_sepconv1_act (Activatio n)	(None, 37, 37, 256)	0	['add_1[0][0]']
block4_sepconv1 (SeparableConv 2D)	(None, 37, 37, 728)	188672	['block4_sepconv1_act[0][0]']
block4_sepconv1_bn (BatchNorma lization)	(None, 37, 37, 728)	2912	['block4_sepconv1[0][0]']
block4_sepconv2_act (Activatio n)	(None, 37, 37, 728)	0	['block4_sepconv1_bn[0][0]']
block4_sepconv2 (SeparableConv 2D)	(None, 37, 37, 728)	536536	['block4_sepconv2_act[0][0]']
block4_sepconv2_bn (BatchNorma lization)	(None, 37, 37, 728)	2912	['block4_sepconv2[0][0]']
conv2d_2 (Conv2D)	(None, 19, 19, 728)	186368	['add_1[0][0]']
block4_pool (MaxPooling2D)	(None, 19, 19, 728)	0	['block4_sepconv2_bn[0][0]']
batch_normalization_2 (BatchNo rmalization)	(None, 19, 19, 728)	2912	['conv2d_2[0][0]']
add_2 (Add)	(None, 19, 19, 728)	0	['block4_pool[0][0]', 'batch_normalization_2[0][0]']
block5_sepconv1_act (Activatio n)	(None, 19, 19, 728)	0	['add_2[0][0]']
block5_sepconv1 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block5_sepconv1_act[0][0]']
block5_sepconv1_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block5_sepconv1[0][0]']
block5_sepconv2_act (Activatio n)	(None, 19, 19, 728)	0	['block5_sepconv1_bn[0][0]']
block5_sepconv2 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block5_sepconv2_act[0][0]']
block5_sepconv2_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block5_sepconv2[0][0]']
block5_sepconv3_act (Activatio n)	(None, 19, 19, 728)	0	['block5_sepconv2_bn[0][0]']
block5_sepconv3 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block5_sepconv3_act[0][0]']
block5_sepconv3_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block5_sepconv3[0][0]']
add_3 (Add)	(None, 19, 19, 728)	0	['block5_sepconv3_bn[0][0]', 'add_2[0][0]']
block6_sepconv1_act (Activatio n)	(None, 19, 19, 728)	0	['add_3[0][0]']
block6_sepconv1 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block6_sepconv1_act[0][0]']

block6_sepconv1_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block6_sepconv1[0][0]']
block6_sepconv2_act (Activatio n)	(None, 19, 19, 728)	0	['block6_sepconv1_bn[0][0]']
block6_sepconv2 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block6_sepconv2_act[0][0]']
block6_sepconv2_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block6_sepconv2[0][0]']
block6_sepconv3_act (Activatio n)	(None, 19, 19, 728)	0	['block6_sepconv2_bn[0][0]']
block6_sepconv3 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block6_sepconv3_act[0][0]']
block6_sepconv3_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block6_sepconv3[0][0]']
add_4 (Add)	(None, 19, 19, 728)	0	['block6_sepconv3_bn[0][0]', 'add_3[0][0]']
block7_sepconv1_act (Activatio n)	(None, 19, 19, 728)	0	['add_4[0][0]']
block7_sepconv1 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block7_sepconv1_act[0][0]']
block7_sepconv1_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block7_sepconv1[0][0]']
block7_sepconv2_act (Activatio n)	(None, 19, 19, 728)	0	['block7_sepconv1_bn[0][0]']
block7_sepconv2 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block7_sepconv2_act[0][0]']
block7_sepconv2_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block7_sepconv2[0][0]']
block7_sepconv3_act (Activatio n)	(None, 19, 19, 728)	0	['block7_sepconv2_bn[0][0]']
block7_sepconv3 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block7_sepconv3_act[0][0]']
block7_sepconv3_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block7_sepconv3[0][0]']

add_5 (Add)	(None, 19, 19, 728)	0	['block7_sepconv3_bn[0][0]', 'add_4[0][0]']
block8_sepconv1_act (Activatio n)	(None, 19, 19, 728)	0	['add_5[0][0]']
block8_sepconv1 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block8_sepconv1_act[0][0]']
block8_sepconv1_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block8_sepconv1[0][0]']
block8_sepconv2_act (Activatio n)	(None, 19, 19, 728)	0	['block8_sepconv1_bn[0][0]']
block8_sepconv2 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block8_sepconv2_act[0][0]']
block8_sepconv2_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block8_sepconv2[0][0]']
block8_sepconv3_act (Activatio n)	(None, 19, 19, 728)	0	['block8_sepconv2_bn[0][0]']
block8_sepconv3 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block8_sepconv3_act[0][0]']
block8_sepconv3_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block8_sepconv3[0][0]']
add_6 (Add)	(None, 19, 19, 728)	0	['block8_sepconv3_bn[0][0]', 'add_5[0][0]']
block9_sepconv1_act (Activatio n)	(None, 19, 19, 728)	0	['add_6[0][0]']
block9_sepconv1 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block9_sepconv1_act[0][0]']
block9_sepconv1_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block9_sepconv1[0][0]']
block9_sepconv2_act (Activatio n)	(None, 19, 19, 728)	0	['block9_sepconv1_bn[0][0]']
block9_sepconv2 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block9_sepconv2_act[0][0]']
block9_sepconv2_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block9_sepconv2[0][0]']

block9_sepconv3_act (Activatio n)	(None, 19, 19, 728)	0	['block9_sepconv2_bn[0][0]']
block9_sepconv3 (SeparableConv 2D)	(None, 19, 19, 728)	536536	['block9_sepconv3_act[0][0]']
block9_sepconv3_bn (BatchNorma lization)	(None, 19, 19, 728)	2912	['block9_sepconv3[0][0]']
add_7 (Add)	(None, 19, 19, 728)	0	['block9_sepconv3_bn[0][0]', 'add_6[0][0]']
block10_sepconv1_act (Activati on)	(None, 19, 19, 728)	0	['add_7[0][0]']
block10_sepconv1 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block10_sepconv1_act[0][0]']
block10_sepconv1_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block10_sepconv1[0][0]']
block10_sepconv2_act (Activati on)	(None, 19, 19, 728)	0	['block10_sepconv1_bn[0][0]']
block10_sepconv2 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block10_sepconv2_act[0][0]']
block10_sepconv2_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block10_sepconv2[0][0]']
block10_sepconv3_act (Activati on)	(None, 19, 19, 728)	0	['block10_sepconv2_bn[0][0]']
block10_sepconv3 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block10_sepconv3_act[0][0]']
block10_sepconv3_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block10_sepconv3[0][0]']
add_8 (Add)	(None, 19, 19, 728)	0	['block10_sepconv3_bn[0][0]', 'add_7[0][0]']
block11_sepconv1_act (Activati on)	(None, 19, 19, 728)	0	['add_8[0][0]']
block11_sepconv1 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block11_sepconv1_act[0][0]']
block11_sepconv1_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block11_sepconv1[0][0]']
block11_sepconv2_act (Activati on)	(None, 19, 19, 728)	0	['block11_sepconv1_bn[0][0]']
block11_sepconv2 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block11_sepconv2_act[0][0]']
block11_sepconv2_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block11_sepconv2[0][0]']
block11_sepconv3_act (Activati on)	(None, 19, 19, 728)	0	['block11_sepconv2_bn[0][0]']
block11_sepconv3 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block11_sepconv3_act[0][0]']
block11_sepconv3_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block11_sepconv3[0][0]']
add_9 (Add)	(None, 19, 19, 728)	0	['block11_sepconv3_bn[0][0]', 'add_8[0][0]']
block12_sepconv1_act (Activati on)	(None, 19, 19, 728)	0	['add_9[0][0]']
block12_sepconv1 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block12_sepconv1_act[0][0]']
block12_sepconv1_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block12_sepconv1[0][0]']
block12_sepconv2_act (Activati on)	(None, 19, 19, 728)	0	['block12_sepconv1_bn[0][0]']
block12_sepconv2 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block12_sepconv2_act[0][0]']
block12_sepconv2_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block12_sepconv2[0][0]']
block12_sepconv3_act (Activati on)	(None, 19, 19, 728)	0	['block12_sepconv2_bn[0][0]']
block12_sepconv3 (SeparableCon v2D)	(None, 19, 19, 728)	536536	['block12_sepconv3_act[0][0]']
block12_sepconv3_bn (BatchNorm alization)	(None, 19, 19, 728)	2912	['block12_sepconv3[0][0]']
add_10 (Add)	(None, 19, 19, 728)	0	['block12_sepconv3_bn[0][0]', 'add_9[0][0]']

```
                                                                     'add_9[0][0]']

            block13_sepconv1_act (Activati  (None, 19, 19, 728)  0    ['add_10[0][0]']
            on)

            block13_sepconv1 (SeparableCon  (None, 19, 19, 728)  536536  ['block13_sepconv1_act[0][0]']
            v2D)

            block13_sepconv1_bn (BatchNorm  (None, 19, 19, 728)  2912    ['block13_sepconv1[0][0]']
            alization)

            block13_sepconv2_act (Activati  (None, 19, 19, 728)  0    ['block13_sepconv1_bn[0][0]']
            on)

            block13_sepconv2 (SeparableCon  (None, 19, 19, 1024  752024  ['block13_sepconv2_act[0][0]']
            v2D)                            )

            block13_sepconv2_bn (BatchNorm  (None, 19, 19, 1024  4096    ['block13_sepconv2[0][0]']
            alization)                      )

            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 (BatchNo  (None, 10, 10, 1024  4096    ['conv2d_3[0][0]']
            rmalization)                    )

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

            block14_sepconv1 (SeparableCon  (None, 10, 10, 1536  1582080  ['add_11[0][0]']
            v2D)                            )

            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
            _____
```

In [13]: `model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])`

In [19]:
```
r = model.fit_generator(training_set,
                        validation_data=test_set,
                        epochs=30,
                        steps_per_epoch=len(training_set)//32,
                        validation_steps=len(test_set)//32
                        )
```

```
C:\Users\SRI SAI\AppData\Local\Temp\ipykernel_7336\2721303376.py:1: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Ple
ase use `Model.fit`, which supports generators.
  r = model.fit_generator(training_set,
Epoch 1/30
3/3 [==============================] - 75s 29s/step - loss: 2.6565 - accuracy: 0.8021 - val_loss: 3.1720 - val_accuracy: 0.7500
Epoch 2/30
3/3 [==============================] - 58s 23s/step - loss: 3.3913 - accuracy: 0.7708 - val_loss: 2.9005 - val_accuracy: 0.7500
Epoch 3/30
3/3 [==============================] - 55s 22s/step - loss: 3.5876 - accuracy: 0.7396 - val_loss: 2.6472 - val_accuracy: 0.7917
Epoch 4/30
3/3 [==============================] - 55s 22s/step - loss: 2.8447 - accuracy: 0.7604 - val_loss: 4.0986 - val_accuracy: 0.7708
Epoch 5/30
3/3 [==============================] - 54s 22s/step - loss: 3.9040 - accuracy: 0.7604 - val_loss: 2.7981 - val_accuracy: 0.7188
Epoch 6/30
3/3 [==============================] - 55s 22s/step - loss: 2.1252 - accuracy: 0.8333 - val_loss: 2.0358 - val_accuracy: 0.8021
Epoch 7/30
3/3 [==============================] - 49s 22s/step - loss: 3.1932 - accuracy: 0.7692 - val_loss: 2.9658 - val_accuracy: 0.7708
Epoch 8/30
3/3 [==============================] - 53s 21s/step - loss: 5.5181 - accuracy: 0.7396 - val_loss: 2.7313 - val_accuracy: 0.7812
Epoch 9/30
3/3 [==============================] - 52s 21s/step - loss: 2.6200 - accuracy: 0.8125 - val_loss: 2.4544 - val_accuracy: 0.6875
Epoch 10/30
3/3 [==============================] - 52s 20s/step - loss: 2.3717 - accuracy: 0.7917 - val_loss: 3.0723 - val_accuracy: 0.6979
Epoch 11/30
3/3 [==============================] - 53s 21s/step - loss: 3.2614 - accuracy: 0.7500 - val_loss: 2.3165 - val_accuracy: 0.8125
Epoch 12/30
3/3 [==============================] - 52s 20s/step - loss: 4.0855 - accuracy: 0.6875 - val_loss: 3.2525 - val_accuracy: 0.7812
Epoch 13/30
3/3 [==============================] - 51s 21s/step - loss: 3.0122 - accuracy: 0.8229 - val_loss: 2.4100 - val_accuracy: 0.7500
Epoch 14/30
3/3 [==============================] - 50s 20s/step - loss: 2.5197 - accuracy: 0.7604 - val_loss: 1.2110 - val_accuracy: 0.8229
```

```
Epoch 7/30
3/3 [==============================] - 49s 22s/step - loss: 3.1932 - accuracy: 0.7692 - val_loss: 2.9658 - val_accuracy: 0.7708
Epoch 8/30
3/3 [==============================] - 53s 21s/step - loss: 5.5181 - accuracy: 0.7396 - val_loss: 2.7313 - val_accuracy: 0.7812
Epoch 9/30
3/3 [==============================] - 52s 21s/step - loss: 2.6200 - accuracy: 0.8125 - val_loss: 2.4544 - val_accuracy: 0.6875
Epoch 10/30
3/3 [==============================] - 52s 20s/step - loss: 2.3717 - accuracy: 0.7917 - val_loss: 3.0723 - val_accuracy: 0.6979
Epoch 11/30
3/3 [==============================] - 53s 21s/step - loss: 3.2614 - accuracy: 0.7500 - val_loss: 2.3165 - val_accuracy: 0.8125
Epoch 12/30
3/3 [==============================] - 52s 20s/step - loss: 4.0855 - accuracy: 0.6875 - val_loss: 3.2525 - val_accuracy: 0.7812
Epoch 13/30
3/3 [==============================] - 51s 21s/step - loss: 3.0122 - accuracy: 0.8229 - val_loss: 2.4100 - val_accuracy: 0.7500
Epoch 14/30
3/3 [==============================] - 50s 20s/step - loss: 2.5197 - accuracy: 0.7604 - val_loss: 1.2110 - val_accuracy: 0.8229
Epoch 15/30
3/3 [==============================] - 52s 20s/step - loss: 3.1242 - accuracy: 0.7917 - val_loss: 3.1027 - val_accuracy: 0.7292
Epoch 16/30
3/3 [==============================] - 50s 20s/step - loss: 3.3930 - accuracy: 0.7396 - val_loss: 1.5712 - val_accuracy: 0.8750
Epoch 17/30
3/3 [==============================] - 53s 21s/step - loss: 2.5512 - accuracy: 0.7812 - val_loss: 1.9767 - val_accuracy: 0.7812
Epoch 18/30
3/3 [==============================] - 50s 20s/step - loss: 2.0621 - accuracy: 0.8229 - val_loss: 2.6166 - val_accuracy: 0.6875
Epoch 19/30
3/3 [==============================] - 51s 20s/step - loss: 4.3960 - accuracy: 0.7083 - val_loss: 2.5433 - val_accuracy: 0.7396
Epoch 20/30
3/3 [==============================] - 52s 21s/step - loss: 1.6552 - accuracy: 0.8438 - val_loss: 3.4086 - val_accuracy: 0.7083
Epoch 21/30
3/3 [==============================] - 52s 20s/step - loss: 3.8576 - accuracy: 0.7917 - val_loss: 3.9289 - val_accuracy: 0.8021
Epoch 22/30
3/3 [==============================] - 49s 19s/step - loss: 3.0081 - accuracy: 0.7292 - val_loss: 2.4708 - val_accuracy: 0.7396
Epoch 23/30
3/3 [==============================] - 49s 20s/step - loss: 2.1175 - accuracy: 0.7812 - val_loss: 1.4821 - val_accuracy: 0.8125
Epoch 24/30
3/3 [==============================] - 54s 22s/step - loss: 3.0934 - accuracy: 0.7500 - val_loss: 2.5336 - val_accuracy: 0.7917
Epoch 25/30
3/3 [==============================] - 51s 23s/step - loss: 3.4418 - accuracy: 0.7821 - val_loss: 3.1132 - val_accuracy: 0.7917
Epoch 26/30
3/3 [==============================] - 54s 21s/step - loss: 1.6937 - accuracy: 0.8229 - val_loss: 1.6791 - val_accuracy: 0.8438
Epoch 27/30
3/3 [==============================] - 51s 20s/step - loss: 3.0819 - accuracy: 0.7917 - val_loss: 2.6662 - val_accuracy: 0.7604
Epoch 28/30
3/3 [==============================] - 53s 21s/step - loss: 3.1102 - accuracy: 0.7500 - val_loss: 1.7582 - val_accuracy: 0.7604
Epoch 29/30
3/3 [==============================] - 53s 20s/step - loss: 2.0389 - accuracy: 0.7917 - val_loss: 2.2502 - val_accuracy: 0.7500
Epoch 30/30
3/3 [==============================] - 53s 21s/step - loss: 2.8220 - accuracy: 0.8229 - val_loss: 1.1712 - val_accuracy: 0.8542
```

In [20]:
```python
model.save('Updated-Xception-diabetic-retinopathy.h5')
```