

IMPORT THE LIBRARIES

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
```

```
train_datagen=ImageDataGenerator(rescale=1./255, zoom_range=0.2, horizontal_flip=True, vertical_flip=False)
```

```
test_datagen=ImageDataGenerator(rescale=1./255)
```

```
x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/Fertilizers_Recommendation_System_For_Disease_Prediction/Dataset Plant Disease/fruit-dataset/fruit-dataset/train", target_size=(
    class_mode='categorical', batch_size=24)
```

Found 5384 images belonging to 6 classes.

```
x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/Fertilizers_Recommendation_System_For_Disease_Prediction/Dataset Plant Disease/fruit-dataset/fruit-dataset/test", target_size=(128
    class_mode='categorical', batch_size=24)
```

Found 1686 images belonging to 6 classes.

INITIALIZE THE MODEL

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
```

```
train_datagen=ImageDataGenerator(rescale=1./255, zoom_range=0.2, horizontal_flip=True, vertical_flip=False)
```

```
test_datagen=ImageDataGenerator(rescale=1./255)
```

```
x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/Fertilizers_Recommendation_System_For_Disease_Prediction/Dataset Plant Disease/fruit-dataset/fruit-dataset/train", target_size=(
    class_mode='categorical', batch_size=24)
```

Found 5384 images belonging to 6 classes.

```
x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/Fertilizers_Recommendation_System_For_Disease_Prediction/Dataset Plant Disease/fruit-dataset/fruit-dataset/test", target_size=(128
    class_mode='categorical', batch_size=24)
```

Found 1686 images belonging to 6 classes.

ADDING CNN

```
[6] from tensorflow.keras.models import Sequential  
  
[7] from tensorflow.keras.layers import Dense, Convolution2D, MaxPooling2D, Flatten  
  
[10] model=Sequential()
```

ADDING DNN

The screenshot shows a Jupyter Notebook interface with a sidebar on the left displaying a project structure. The main area contains a code cell with the following Python code:

```
model=Sequential()  
  
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))  
  
model.add(MaxPooling2D(pool_size=(2,2)))  
  
model.add(Flatten())  
  
model.summary()
```

Below the code, the output of the `model.summary()` function is displayed, showing the model's architecture and parameters:

```
Model: "sequential"  
  
Layer (type)           Output Shape          Param #  
-----  
conv2d (Conv2D)         (None, 128, 128, 32)  896  
max_pooling2d (MaxPooling2D) (None, 63, 63, 32)    0  
flatten (Flatten)       (None, 127008)        0  
-----  
Total params: 896  
Trainable params: 896  
Non-trainable params: 0
```

The interface also shows a browser window at the top with the URL `https://github.dev/IBM-EPBL/IBM-Project-5349-1658759791/blob/main/Project%20Development%20Phase/Sprint%202/MODEL%20BUILDING%20FOR%20FRUIT%20DISEASE%20PREDICTION.ipynb`.

SAVING MODEL

```
[22] model.save('fdata.h5')
```

TEST THE MODEL

```
[23] import numpy as np
```

```
[24] from tensorflow.keras.models import load_model
```

```
[25] from tensorflow.keras.preprocessing import image
```

```
[26] model=load_model('fdata.h5')
```