In [1]:
```
ls
```

```
sample_data/
```

In [2]:
```
pwd
```

Out[2]:
```
'/content'
```

In [3]:
```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
```

In [4]:
```
train_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.2,horizontal_flip=True,vertical_flip=False)
```

In [5]:
```
test_datagen=ImageDataGenerator(rescale=1./255)
```

In [6]:
```
ls
```

```
sample_data/
```

In [23]:
```
x_train=train_datagen.flow_from_directory('/content/drive/MyDrive/Classroom/Dataset Plant Disease/fruit-dataset/fruit-dataset/train', class_mode='cate
```

```
Found 56 images belonging to 6 classes.
```

In [24]:
```
x_test=test_datagen.flow_from_directory('/content/drive/MyDrive/Classroom/Dataset Plant Disease/fruit-dataset/fruit-dataset/test', class_mode='categor
```

```
Found 154 images belonging to 6 classes.
```

In [25]:
```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense,Convolution2D,MaxPooling2D,Flatten
```

In [26]:
```
model=Sequential()
```

In [28]:
```
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.summary()
```

```
Model: "sequential_1"
_________________________________________________________________
 Layer (type)                 Output Shape              Param #
=================================================================
 conv2d_1 (Conv2D)            (None, 126, 126, 32)      896

 max_pooling2d_1 (MaxPooling  (None, 63, 63, 32)       0
 2D)

 flatten_1 (Flatten)          (None, 127008)            0

=================================================================
Total params: 896
Trainable params: 896
Non-trainable params: 0
_________________________________________________________________
```

In [29]:
```
32*(3*3*3+1)
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
```

In [30]:
```
model.add(Dense(6,activation='softmax'))
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
len(x_train)
```

Out[30]: 3

In [31]:
```
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```

Out[31]: 51.583333333333336

In [32]:
```
model.fit(x_train,steps_per_epoch=len(x_train),validation_data=x_test,validation_steps=len(x_test),epochs=10)
```

In [33]:
```
model.save('fruitdata.h5')
```

In [34]:
```
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
```

In [35]:
```
model=load_model('fruitdata.h5')
```

In [36]:
```
img=image.load_img('/content/drive/MyDrive/Classroom/Dataset Plant Disease/fruit-dataset/fruit-dataset/train/Corn_(maize)___Northern_Leaf_Blight/10b05
```

In [37]:
```
img
```

Out[37]:

In [38]:
```
img=image.load_img('/content/drive/MyDrive/Classroom/Dataset Plant Disease/fruit-dataset/fruit-dataset/train/Peach___Bacterial_spot/9a078cfa-5766-47c5
img
```

Out[38]:

In [39]:
```
x=image.img_to_array(img)
```

In [40]:
```
x
```

Out[40]:
```
array([[[187., 186., 220.],
        [171., 170., 204.],
        [157., 156., 190.],
        ...,
        [ 68.,  66., 106.],
        [ 92.,  89., 132.],
        [ 92.,  89., 132.]],

       [[168., 167., 201.],
        [157., 156., 190.],
        [150., 149., 183.],
        ...,
        [ 69.,  67., 106.],
        [ 99.,  97., 137.],
        [ 83.,  80., 123.]],

       [[161., 160., 194.],
        [156., 155., 189.],
        [152., 151., 185.],
        ...,
```

```
 ...,
 [ 68.,  66., 106.],
 [ 92.,  89., 132.],
 [ 92.,  89., 132.]],

[[168., 167., 201.],
 [157., 156., 190.],
 [150., 149., 183.],
 ...,
 [ 69.,  67., 106.],
 [ 99.,  97., 137.],
 [ 83.,  80., 123.]],

[[161., 160., 194.],
 [156., 155., 189.],
 [152., 151., 185.],
 ...,
 [ 96.,  94., 131.],
 [111., 109., 148.],
 [ 63.,  61., 101.]],

...,

[[140., 143., 178.],
 [140., 143., 178.],
 [139., 142., 177.],
 ...,
 [ 74.,  73., 105.],
 [ 75.,  74., 106.],
 [ 72.,  71., 103.]],

[[139., 142., 177.],
 [140., 143., 178.],
 [140., 143., 178.],
 ...,
 [ 93.,  92., 124.],
 [ 88.,  87., 119.],
 [ 79.,  78., 110.]],

[[137., 140., 175.],
 [139., 142., 177.],
 [141., 144., 179.],
 ...,
 [ 90.,  89., 121.],
 [ 79.,  78., 110.],
 [ 63.,  62.,  94.]]], dtype=float32)
```

In [43]:
```
x_train.class_indices
```

Out[43]:
```
{'Apple___Black_rot': 0,
 'Apple___healthy': 1,
 'Corn_(maize)___Northern_Leaf_Blight': 2,
 'Corn_(maize)___healthy': 3,
 'Peach___Bacterial_spot': 4,
 'Peach___healthy': 5}
```

In [47]:
```
index=['Apple__Black_rot','Apple_healthy','Corn(maize)__Northern_Leaf_Blight','Corn(maize)___healthy']
```

In [ ]:
```
index[y[0]]
```

In [ ]:
```
img=image.load_img('/content/drive/MyDrive/Classroom/Dataset Plant Disease/Veg-dataset/Veg-dataset/train_set/Pepper,_bell___healthy/0119205b-cfac-4322
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['Pepper,_bell_Bacterial_spot','Pepper,_bell_healthy','Potato_Early_blight','Potato_Late_blight','Potato_healthy','Tomato_Bacterial_spot','Tomat
index[y[0]]
```

In [ ]: