Project Development Phase
Model Performance Test

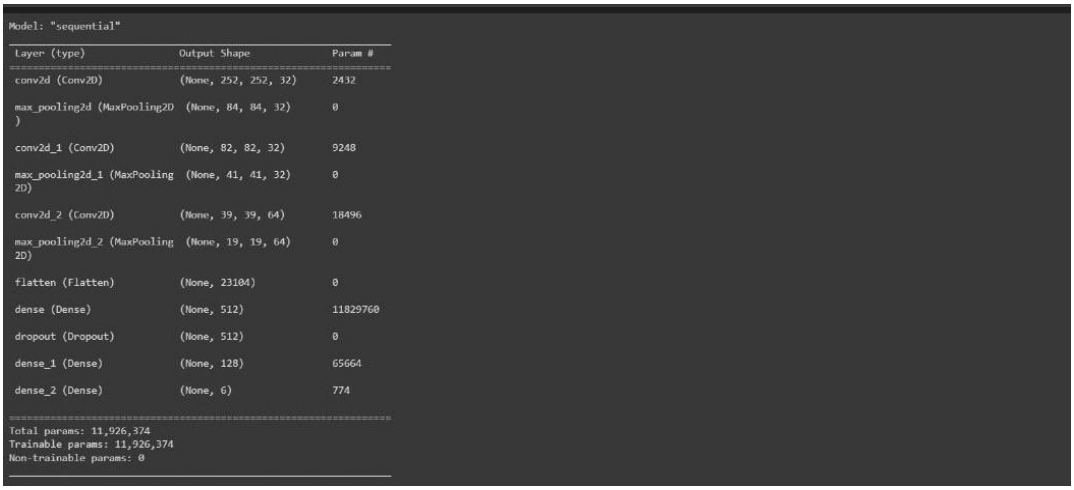
Date	10 November 2022
Team ID	PNT2022TMID10907
Project Name	Project - Fertilizers Recommendation System For Disease Prediction
Maximum Marks	10 Marks

MODEL PERFORMANCE TESTING:

Performance testing is the practice of evaluating how a system performs in terms of responsiveness and stability under a particular workload.

MODEL SUMMARY :

FRUIT:



```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 252, 252, 32)      2432

 max_pooling2d (MaxPooling2D  (None, 84, 84, 32)       0
 )

 conv2d_1 (Conv2D)           (None, 82, 82, 32)        9248

 max_pooling2d_1 (MaxPooling  (None, 41, 41, 32)       0
 2D)

 conv2d_2 (Conv2D)           (None, 39, 39, 64)        18496

 max_pooling2d_2 (MaxPooling  (None, 19, 19, 64)       0
 2D)

 flatten (Flatten)           (None, 23104)             0

 dense (Dense)               (None, 512)               11829760

 dropout (Dropout)           (None, 512)               0

 dense_1 (Dense)             (None, 128)               65664

 dense_2 (Dense)             (None, 6)                 774

=================================================================
Total params: 11,926,374
Trainable params: 11,926,374
Non-trainable params: 0
_________________________________________________________________
```

VEGETABLE:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 252, 252, 32)      2432

 max_pooling2d (MaxPooling2D  (None, 84, 84, 32)       0
 )

 conv2d_1 (Conv2D)           (None, 82, 82, 32)        9248

 max_pooling2d_1 (MaxPooling  (None, 41, 41, 32)       0
 2D)

 conv2d_2 (Conv2D)           (None, 39, 39, 64)        18496

 max_pooling2d_2 (MaxPooling  (None, 19, 19, 64)       0
 2D)

 flatten (Flatten)           (None, 23104)             0

 dense (Dense)               (None, 512)               11829760

 dropout (Dropout)           (None, 512)               0

 dense_1 (Dense)             (None, 128)               65664

 dense_2 (Dense)             (None, 9)                 1161

=================================================================
Total params: 11,926,761
Trainable params: 11,926,761
Non-trainable params: 0
_________________________________________________________________
```

TRAINING ACCURACY :

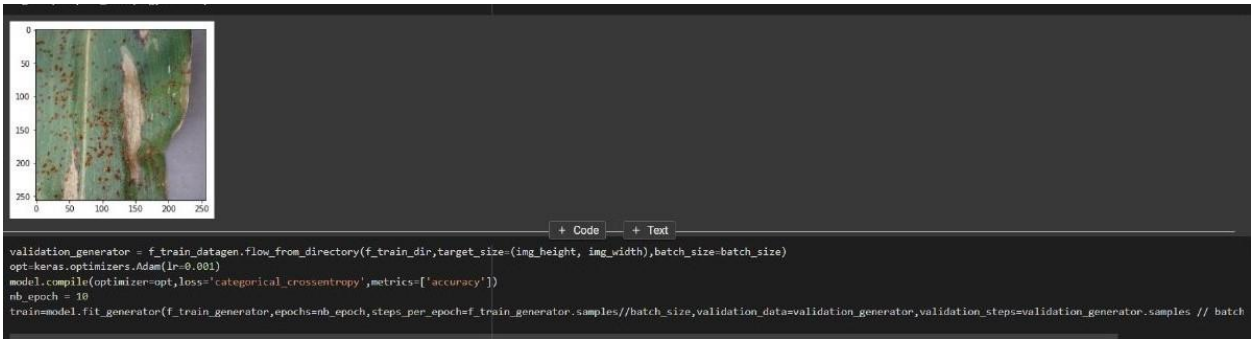
VEGETABLE

```
from keras.preprocessing import image
from tensorflow.keras.utils import load_img
from tensorflow.keras.utils import img_to_array
import numpy as np
img1 = load_img('/content/drive/MyDrive/Project/Dataset Plant Disease/Veg-dataset/Veg-dataset/train_set/Tomato___Late_blight/013f987a-9371-4763-a104-ea6f326e584b___GHLB2 Leaf 8556.JPG')
plt.imshow(img1);
#preprocess image
img1 = load_img('/content/drive/MyDrive/Project/Dataset Plant Disease/Veg-dataset/Veg-dataset/train_set/Tomato___Late_blight/013f987a-9371-4763-a104-ea6f326e584b___GHLB2 Leaf 8556.JPG', target_size=(256, 2
img = img_to_array(img1)
img = img/255
img = np.expand_dims(img, axis=0)
```


```
v_train_generator.class_indices
```

```
{'Pepper,_bell___Bacterial_spot': 0,
 'Pepper,_bell___healthy': 1,
 'Potato___Early_blight': 2,
 'Potato___Late_blight': 3,
 'Potato___healthy': 4,
 'Tomato___Bacterial_spot': 5,
 'Tomato___Late_blight': 6,
 'Tomato___Leaf_Mold': 7,
 'Tomato___Septoria_leaf_spot': 8}
```

FRUIT

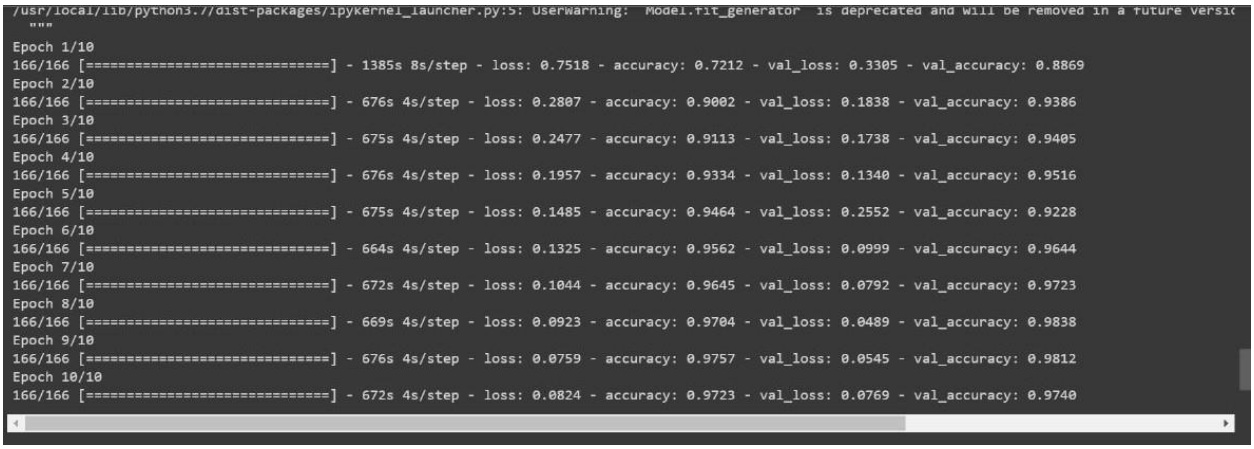



```
f_train_generator.class_indices
```

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

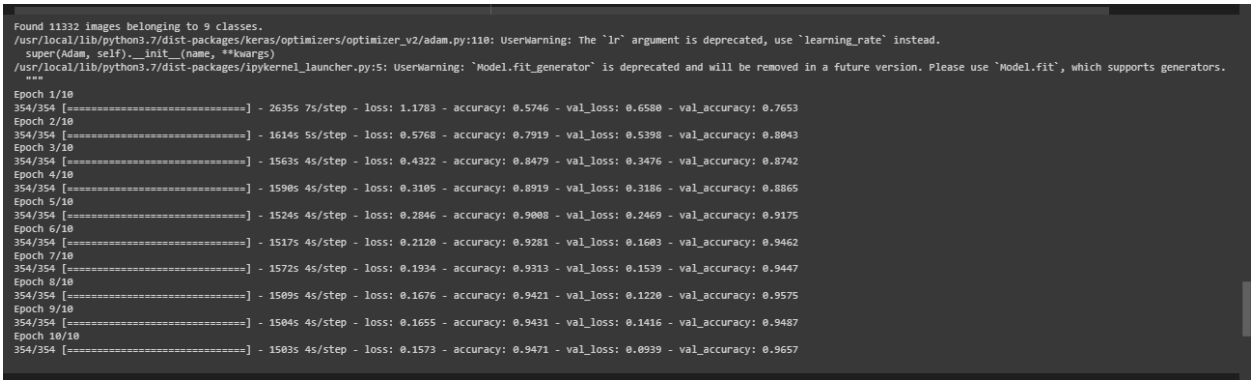
VALIDATION ACCURACY:

FRUIT :



```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:5: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future versi
  """
Epoch 1/10
166/166 [==============================] - 1385s 8s/step - loss: 0.7518 - accuracy: 0.7212 - val_loss: 0.3305 - val_accuracy: 0.8869
Epoch 2/10
166/166 [==============================] - 676s 4s/step - loss: 0.2807 - accuracy: 0.9002 - val_loss: 0.1838 - val_accuracy: 0.9386
Epoch 3/10
166/166 [==============================] - 675s 4s/step - loss: 0.2477 - accuracy: 0.9113 - val_loss: 0.1738 - val_accuracy: 0.9405
Epoch 4/10
166/166 [==============================] - 676s 4s/step - loss: 0.1957 - accuracy: 0.9334 - val_loss: 0.1340 - val_accuracy: 0.9516
Epoch 5/10
166/166 [==============================] - 675s 4s/step - loss: 0.1485 - accuracy: 0.9464 - val_loss: 0.2552 - val_accuracy: 0.9228
Epoch 6/10
166/166 [==============================] - 664s 4s/step - loss: 0.1325 - accuracy: 0.9562 - val_loss: 0.0999 - val_accuracy: 0.9644
Epoch 7/10
166/166 [==============================] - 672s 4s/step - loss: 0.1044 - accuracy: 0.9645 - val_loss: 0.0792 - val_accuracy: 0.9723
Epoch 8/10
166/166 [==============================] - 669s 4s/step - loss: 0.0923 - accuracy: 0.9704 - val_loss: 0.0489 - val_accuracy: 0.9838
Epoch 9/10
166/166 [==============================] - 676s 4s/step - loss: 0.0759 - accuracy: 0.9757 - val_loss: 0.0545 - val_accuracy: 0.9812
Epoch 10/10
166/166 [==============================] - 672s 4s/step - loss: 0.0824 - accuracy: 0.9723 - val_loss: 0.0769 - val_accuracy: 0.9740
```

VEGETABLE:



```
Found 11332 images belonging to 9 classes.
/usr/local/lib/python3.7/dist-packages/keras/optimizers/optimizer_v2/adam.py:110: UserWarning: The `lr` argument is deprecated, use `learning_rate` instead.
  super(Adam, self).__init__(name, **kwargs)
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:5: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.
  """
Epoch 1/10
354/354 [==============================] - 2635s 7s/step - loss: 1.1783 - accuracy: 0.5746 - val_loss: 0.6580 - val_accuracy: 0.7653
Epoch 2/10
354/354 [==============================] - 1614s 5s/step - loss: 0.5768 - accuracy: 0.7919 - val_loss: 0.5398 - val_accuracy: 0.8043
Epoch 3/10
354/354 [==============================] - 1563s 4s/step - loss: 0.4322 - accuracy: 0.8479 - val_loss: 0.3476 - val_accuracy: 0.8742
Epoch 4/10
354/354 [==============================] - 1590s 4s/step - loss: 0.3105 - accuracy: 0.8919 - val_loss: 0.3186 - val_accuracy: 0.8865
Epoch 5/10
354/354 [==============================] - 1524s 4s/step - loss: 0.2846 - accuracy: 0.9008 - val_loss: 0.2469 - val_accuracy: 0.9175
Epoch 6/10
354/354 [==============================] - 1517s 4s/step - loss: 0.2120 - accuracy: 0.9281 - val_loss: 0.1603 - val_accuracy: 0.9462
Epoch 7/10
354/354 [==============================] - 1572s 4s/step - loss: 0.1934 - accuracy: 0.9313 - val_loss: 0.1539 - val_accuracy: 0.9447
Epoch 8/10
354/354 [==============================] - 1509s 4s/step - loss: 0.1676 - accuracy: 0.9421 - val_loss: 0.1220 - val_accuracy: 0.9575
Epoch 9/10
354/354 [==============================] - 1504s 4s/step - loss: 0.1655 - accuracy: 0.9431 - val_loss: 0.1416 - val_accuracy: 0.9487
Epoch 10/10
354/354 [==============================] - 1503s 4s/step - loss: 0.1573 - accuracy: 0.9471 - val_loss: 0.0939 - val_accuracy: 0.9657
```