Project Development Phase
Model Performance Test

Model Performance Testing:

1. Model Summary

   CNN Layers

```
model.summary()
```

Model: "sequential_1"

Layer (type)	Output Shape	Param #
conv2d_1 (Conv2D)	(None, 126, 126, 32)	896
max_pooling2d_1 (MaxPooling 2D)	(None, 63, 63, 32)	0
flatten_1 (Flatten)	(None, 127008)	0

Total params: 896
Trainable params: 896
Non-trainable params: 0

Dense Layers

```
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

dense_20 (Dense)        (None, 300)             38102700

dense_21 (Dense)        (None, 150)             45150

dense_22 (Dense)        (None, 75)              11325

dense_23 (Dense)        (None, 9)               684

=================================================================
Total params: 38,160,755
Trainable params: 38,160,755
Non-trainable params: 0
_____
```

2. Accuracy

Training Accuracy

```
print("Accuracy=",results[1]*100)
```

```
1/1 [==============================] - 0s 39ms/step
Expected: Potato___Early_blight
 Predicted: Potato___Early_blight
Found 3416 images belonging to 9 classes.
50/50 [==============================] - 4s 83ms/step - loss: 2019.1171 - accuracy: 0.3660
Accuracy= 36.59999966621399
```

Vegetable-model-tested_Accuracy

```
print("Accuracy=",results[1]*100)
```

Found 1686 images belonging to 6 classes.
64/64 [==============================] - 5s 76ms/step - loss: 1231.0060 - accuracy: 0.6250
Accuracy= 62.5

Fruit-model-tested_Accuracy

Validation Accuracy

Epoch 1/12
169/169 [==============================] - 96s 565ms/step - loss: 0.0780 - accuracy: 0.9733 - val_loss: 1158.5586 - val_accuracy: 0.6311
Epoch 2/12
169/169 [==============================] - 90s 534ms/step - loss: 0.0568 - accuracy: 0.9803 - val_loss: 1336.4701 - val_accuracy: 0.5890
Epoch 3/12
169/169 [==============================] - 115s 681ms/step - loss: 0.0476 - accuracy: 0.9825 - val_loss: 2344.9492 - val_accuracy: 0.4727
Epoch 4/12
169/169 [==============================] - 134s 794ms/step - loss: 0.0458 - accuracy: 0.9848 - val_loss: 2427.1777 - val_accuracy: 0.4822
Epoch 5/12
169/169 [==============================] - 165s 973ms/step - loss: 0.0844 - accuracy: 0.9749 - val_loss: 785.4515 - val_accuracy: 0.6168
Epoch 6/12
169/169 [==============================] - 153s 904ms/step - loss: 0.0527 - accuracy: 0.9818 - val_loss: 1581.9740 - val_accuracy: 0.6044
Epoch 7/12
169/169 [==============================] - 94s 554ms/step - loss: 0.0422 - accuracy: 0.9881 - val_loss: 1144.1666 - val_accuracy: 0.6376
Epoch 8/12
169/169 [==============================] - 111s 656ms/step - loss: 0.0497 - accuracy: 0.9831 - val_loss: 973.7907 - val_accuracy: 0.6151
Epoch 9/12
169/169 [==============================] - 176s 1s/step - loss: 0.0349 - accuracy: 0.9879 - val_loss: 1441.4517 - val_accuracy: 0.5955
Epoch 10/12
169/169 [==============================] - 171s 1s/step - loss: 0.0516 - accuracy: 0.9840 - val_loss: 1224.8441 - val_accuracy: 0.5510
Epoch 11/12
169/169 [==============================] - 159s 940ms/step - loss: 0.0408 - accuracy: 0.9868 - val_loss: 2179.4436 - val_accuracy: 0.4976
Epoch 12/12
169/169 [==============================] - 184s 1s/step - loss: 0.0416 - accuracy: 0.9866 - val_loss: 1186.5657 - val_accuracy: 0.6358