

## 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 (MaxPooling2D)	(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 (MaxPooling2D)	(None, 63, 63, 32)	0
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