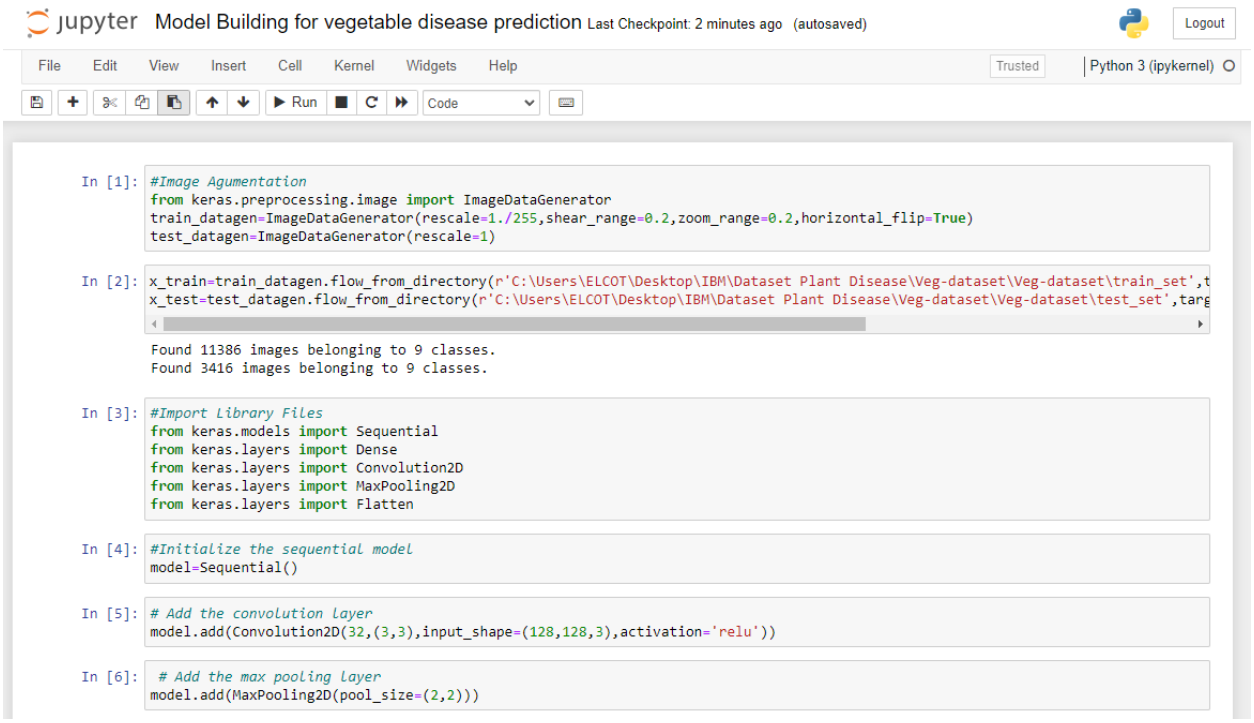
MODEL BUILDING FOR VEGETABLE DISEASE PREDICTION

Team ID	PNT2022TMID51209
Project Name	Project - Fertilizers Recommendation System For Disease Prediction



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Run Code

In [7]:
```
# Add the Flatten Layer
model.add(Flatten())
```

In [8]:
```
# Add the Hidden Layer 1
model.add(Dense(units=300,kernel_initializer='uniform',activation='relu'))
```

In [9]:
```
# Add the Hidden Layer 2
model.add(Dense(units=150,kernel_initializer='uniform',activation='relu'))
```

In [10]:
```
# Add the Hidden Layer 3
model.add(Dense(units=75,kernel_initializer='uniform',activation='relu'))
```

In [11]:
```
# Add the Output Layer
model.add(Dense(units=9,kernel_initializer='uniform',activation='softmax'))
```

In [12]:
```
# Compiling the model
model.compile(loss='categorical_crossentropy',optimizer="adam",metrics=["accuracy"])
```

In [13]:
```
# Train model
model.fit(x_train,steps_per_epoch=89,epochs=20,validation_data=x_test,validation_steps=27)
```

```
Epoch 1/20
89/89 [==============================] - 66s 690ms/step - loss: 2.1881 - accuracy: 0.1685 - val_loss: 194.3618 - val_accuracy:
0.1296
Epoch 2/20
89/89 [==============================] - 59s 663ms/step - loss: 2.1182 - accuracy: 0.1236 - val_loss: 109.5233 - val_accuracy:
0.1296
Epoch 3/20
89/89 [==============================] - 67s 755ms/step - loss: 2.0954 - accuracy: 0.1180 - val_loss: 80.7805 - val_accuracy:
0.1296
```

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Run Code

```
Epoch 4/20
89/89 [==============================] - 73s 817ms/step - loss: 2.1350 - accuracy: 0.1854 - val_loss: 164.9028 - val_accuracy:
0.1111
Epoch 5/20
89/89 [==============================] - 69s 776ms/step - loss: 2.1272 - accuracy: 0.1798 - val_loss: 74.0293 - val_accuracy:
0.1296
Epoch 6/20
89/89 [==============================] - 65s 729ms/step - loss: 2.0987 - accuracy: 0.2079 - val_loss: 94.8363 - val_accuracy:
0.2037
Epoch 7/20
89/89 [==============================] - 57s 643ms/step - loss: 2.0832 - accuracy: 0.2079 - val_loss: 32.7240 - val_accuracy:
0.0926
Epoch 8/20
89/89 [==============================] - 56s 628ms/step - loss: 2.0565 - accuracy: 0.2584 - val_loss: 134.1384 - val_accuracy:
0.2963
Epoch 9/20
89/89 [==============================] - 56s 628ms/step - loss: 2.1103 - accuracy: 0.1517 - val_loss: 61.7429 - val_accuracy:
0.1481
Epoch 10/20
89/89 [==============================] - 55s 622ms/step - loss: 2.0565 - accuracy: 0.2416 - val_loss: 121.7573 - val_accuracy:
0.1481
Epoch 11/20
89/89 [==============================] - 53s 598ms/step - loss: 2.1168 - accuracy: 0.1854 - val_loss: 30.3666 - val_accuracy:
0.1667
Epoch 12/20
89/89 [==============================] - 57s 635ms/step - loss: 2.0713 - accuracy: 0.2079 - val_loss: 56.4360 - val_accuracy:
0.2778
Epoch 13/20
89/89 [==============================] - 59s 665ms/step - loss: 1.9673 - accuracy: 0.2416 - val_loss: 66.7629 - val_accuracy:
0.3333
Epoch 14/20
89/89 [==============================] - 55s 612ms/step - loss: 1.9854 - accuracy: 0.3202 - val_loss: 95.1238 - val_accuracy:
0.3148
```

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Run Code

```
Epoch 15/20
89/89 [==============================] - 55s 614ms/step - loss: 1.7150 - accuracy: 0.3933 - val_loss: 148.8870 - val_accuracy:
0.2037
Epoch 16/20
89/89 [==============================] - 56s 624ms/step - loss: 1.6605 - accuracy: 0.3708 - val_loss: 292.1395 - val_accuracy:
0.2222
Epoch 17/20
89/89 [==============================] - 55s 611ms/step - loss: 1.8242 - accuracy: 0.3427 - val_loss: 156.9938 - val_accuracy:
0.3704
Epoch 18/20
89/89 [==============================] - 56s 628ms/step - loss: 1.7093 - accuracy: 0.3876 - val_loss: 161.5939 - val_accuracy:
0.2778
Epoch 19/20
89/89 [==============================] - 66s 745ms/step - loss: 1.6356 - accuracy: 0.3933 - val_loss: 143.6697 - val_accuracy:
0.3704
Epoch 20/20
89/89 [==============================] - 64s 714ms/step - loss: 1.8686 - accuracy: 0.3427 - val_loss: 70.6791 - val_accuracy:
0.4259
```

Out[13]: <keras.callbacks.History at 0x259831a6be0>

In [16]:
```
# Save model
model.save(r'C:\Users\Elcot\project\flask\uploads\vegetable.h5')
```

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Run Code

In [16]:
```
# Save model
model.save(r'C:\Users\Elcot\project\flask\uploads\vegetable.h5')
```

In [17]:
```
model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 126, 126, 32)      896

 max_pooling2d (MaxPooling2D  (None, 63, 63, 32)       0
 )

 flatten (Flatten)           (None, 127008)            0

 dense (Dense)               (None, 300)               38102700

 dense_1 (Dense)             (None, 150)               45150

 dense_2 (Dense)             (None, 75)                11325

 dense_3 (Dense)             (None, 9)                 684

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