Model Building For Vegetable Disease Prediction

Model is build using augmented and preprocessed Dataset images of Vegetables

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Project Name	Fertilizers Recommendation System For Disease Prediction

1. Import the model building Libraries

```
import numpy as np
import cv2
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D
from tensorflow.keras.layers import MaxPooling2D
from tensorflow.keras.layers import Flatten
from tensorflow.keras.layers import Dropout
from tensorflow.keras.layers import Dense
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.preprocessing import image
from tensorflow.keras.preprocessing.image import img_to_array
import matplotlib.pyplot as plt
```

2. Initializing the model

```
model=Sequential()
```

3. Adding CNN Layers

```
# Step 1 - Convolution
model.add(Conv2D(32, (3, 3), input_shape = (128, 128, 3), activation = 'relu'))

# Step 2 - Pooling
model.add(MaxPooling2D(pool_size = (2, 2)))

# Adding a second convolutional layer
model.add(Conv2D(32, (3, 3), activation = 'relu'))
model.add(MaxPooling2D(pool_size = (2, 2)))

# Step 3 - Flattening
model.add(Flatten())
```

4. Adding Dense Layers

```
# Step 4 - Full connection
model.add(Dense(units = 300, activation = 'relu'))
model.add(Dense(units = 150, activation = 'relu'))
model.add(Dense(units = 9, activation = 'softmax'))
```

5. Train and Save the model

```
history=model.fit(x_train,steps_per_epoch=len(x_train),validation_data=x_test,validation_steps=len(x_test),epochs=10)
```

```
Epoch 1/10
475/475 [==============================] - 72s 133ms/step - loss: 1.2874 - accuracy: 0.5413 - val_loss: 0.6588 - val_accuracy: 0.7632
Epoch 2/10
475/475 [==============================] - 62s 131ms/step - loss: 0.6855 - accuracy: 0.7508 - val_loss: 0.5950 - val_accuracy: 0.7878
Epoch 3/10
475/475 [==============================] - 61s 128ms/step - loss: 0.5188 - accuracy: 0.8151 - val_loss: 0.4609 - val_accuracy: 0.8390
Epoch 4/10
475/475 [==============================] - 60s 127ms/step - loss: 0.4291 - accuracy: 0.8496 - val_loss: 0.3351 - val_accuracy: 0.8882
```

```
model.save('Vegetable.h5')
```