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Team ID	: PNT2022TMID21664
Project Name	:FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

DATASET

Two datasets will be used, we will be creating two models one to detect vegetable leaf diseases like tomato, potato, and pepper plants and the second model would be for fruits diseases like corn, peach, and apple.

Downloading the Plant Disease dataset from the below link

<https://drive.google.com/file/d/1fxs7ptl6zh7NTbCOZARKZ7AmYKjnprY/view>

IMPORT DATASET AND VISUALIZATION OF DATA

#IMPORTING LIBRARIES

```
import numpy as np
import pandas as pd
import os
import matplotlib.pyplot as plt
path = 'Dataset Plant Disease/fruit-dataset/fruit-dataset/train'
plt.figure(figsize=(70, 70))
count = 0
plant_names = []
total_images = 0
for i in os.listdir(path):
    count += 1
    plant_names.append(i)
    plt.subplot(7, 7, count)
```

```
images_path = os.listdir(path + "/" + i)
print("Number of images of " + i + ":", len(images_path), "||", end=" ")
total_images += len(images_path)
image_show = plt.imread(path + "/" + i + "/" + images_path[0])
plt.imshow(image_show)
plt.xlabel(i)
plt.xticks([])
plt.yticks([])
print("Total number of images we have", total_images)
```

OUTPUT:

C:\Users\mumma\PycharmProjects\plant_disease_detection\venv\Scripts\python.exe C:\Users\mumma\PycharmProjects\plant_disease_detection\model.py

Number of images of Apple___Black_rot: 440 ||

Number of images of Apple___healthy: 1200 ||

Number of images of Corn_(maize)___healthy: 861 ||

Number of images of Corn_(maize)___Northern_Leaf_Blight: 768 ||

Number of images of Peach___Bacterial_spot: 1804 ||

Number of images of Peach___healthy: 311 ||

Total number of images we have 5384

IMAGE PREPROCESSING

Before training the model, you have to pre-process the images and then feed them on to the model for training. We make use of Keras ImageDataGenerator class for image pre-processing.

Image Pre-processing includes the following main tasks

- Import ImageDataGenerator Library.
- Configure ImageDataGenerator Class.
- Applying ImageDataGenerator functionality to the trainset and test set.

Image data augmentation is a technique that can be used to artificially expand the size of a training dataset by creating modified versions of images in the dataset.

The Keras deep learning neural network library provides the capability to fit models using image data augmentation via the ImageDataGenerator class.

There are five main types of data augmentation techniques for image data; specifically:

- Image shifts via the width_shift_range and height_shift_range arguments.
- The image flips via the horizontal_flip and vertical_flip arguments.
- The image rotates via the rotation_range argument
- Image brightness via the brightness_range argument.
- The image zooms via the zoom_range argument.

An instance of the ImageDataGenerator class can be constructed for train and test.

Image augmentation

```
train_datagen=ImageDataGenerator(shear_range=0.2, zoom_range=0.2, horizontal_flip=False, vertical_flip=False, fill_mode='nearest', width_shift_range=0.2, height_shift_range=0.2)
```

```
val_datagen=ImageDataGenerator()
```

```
path_train='Dataset Plant Disease/fruit-dataset/fruit-dataset/train'
```

```
path_valid='Dataset Plant Disease/fruit-dataset/fruit-dataset/test'
```

```
train=train_datagen.flow_from_directory(directory=path_train, batch_size=32, target_size=(256,256), color_mode='rgb', class_mode='categorical', seed=42)
```

```
valid=val_datagen.flow_from_directory(directory=path_valid, batch_size=32, target_size=(256,256), color_mode='rgb', class_mode='categorical')
```

OUTPUT:

Found 5384 images belonging to 6 classes.

Found 1686 images belonging to 6 classes.