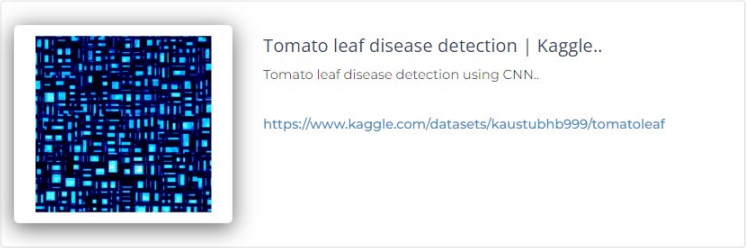
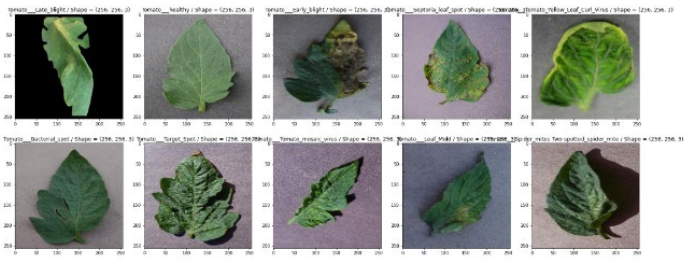
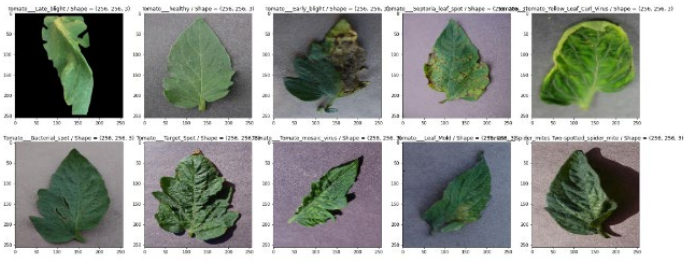
Data Collection and Preprocessing Phase

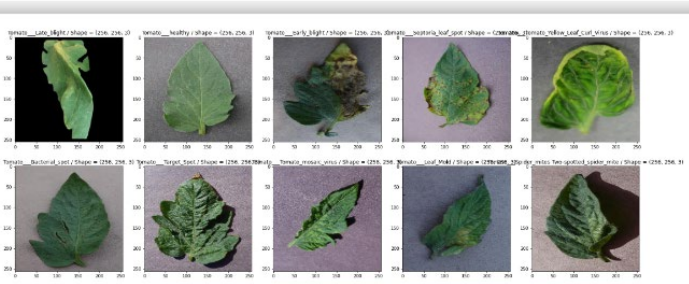
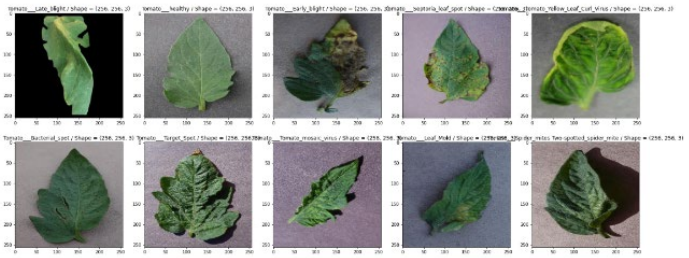
Date	1 July 2024
Team ID	SWTID1720176710
Project Title	Visual Diagnostics: Detecting Tomato Plant Diseases Through Leaf Image Analysis
Maximum Marks	6 Marks

Preprocessing Template

The images will be preprocessed by resizing, normalizing, augmenting, denoising, adjusting contrast, detecting edges, converting color space, cropping, batch normalizing, and whitening data. These steps will enhance data quality, promote model generalization, and improve convergence during neural network training, ensuring robust and efficient performance across various computer vision tasks.

Section	Description
Data Overview	Collect images of Tomato Leaves. Images are then organized into subdirectories based on their respective names as shown in the project structure. In this project, we have collected images of 10 types of Tomato Leaf images like Heatly, Spider Mites, Yellow leaf curl, etc. and they are saved in the respective sub directories with their respective names. You can download the dataset used in this project using the below link Dataset: https://www.kaggle.com/datasets/kaustubhb999/tomatoleaf 

Resizing	[6]: ``` # Training data visualization classes = os.listdir('./train') plt.figure(figsize=(25,10)) for i in enumerate(classes): pic = os.listdir('./train/'+i[1])[0] image = Image.open('./train/'+i[1]+'/'+pic) image = np.asarray(image) plt.subplot(2,5,i[0]+1) plt.title('{0} / Shape = {1}'.format(i[1], image.shape)) plt.imshow(image) plt.show() ``` 
Normalization	[6]: ``` # Training data visualization classes = os.listdir('./train') plt.figure(figsize=(25,10)) for i in enumerate(classes): pic = os.listdir('./train/'+i[1])[0] image = Image.open('./train/'+i[1]+'/'+pic) image = np.asarray(image) plt.subplot(2,5,i[0]+1) plt.title('{0} / Shape = {1}'.format(i[1], image.shape)) plt.imshow(image) plt.show() ``` 

Data Augmentation	[6]: ``` # Training data visualization classes = os.listdir('./train') plt.figure(figsize=(25,10)) for i in enumerate(classes): pic = os.listdir('./train/'+i[1])[0] image = Image.open('./train/'+i[1]+'/'+pic) image = np.asarray(image) plt.subplot(2,5,i[0]+1) plt.title('{0} / Shape = {1}'.format(i[1], image.shape)) plt.imshow(image) plt.show() ``` 
Denoising	[6]: ``` # Training data visualization classes = os.listdir('./train') plt.figure(figsize=(25,10)) for i in enumerate(classes): pic = os.listdir('./train/'+i[1])[0] image = Image.open('./train/'+i[1]+'/'+pic) image = np.asarray(image) plt.subplot(2,5,i[0]+1) plt.title('{0} / Shape = {1}'.format(i[1], image.shape)) plt.imshow(image) plt.show() ``` 

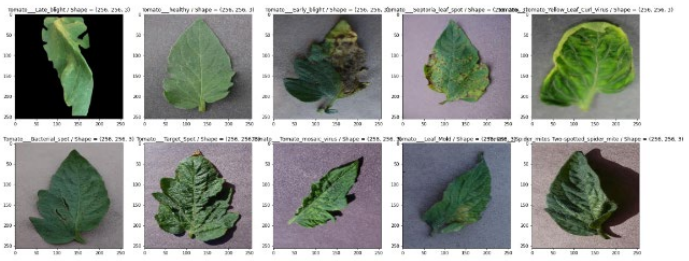
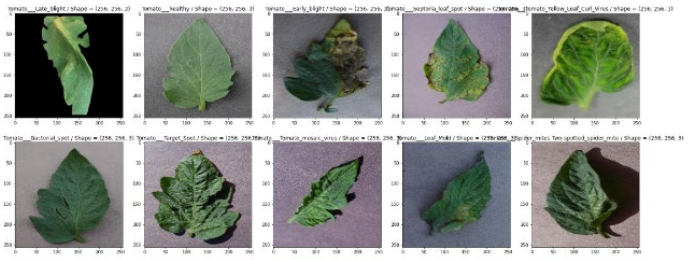
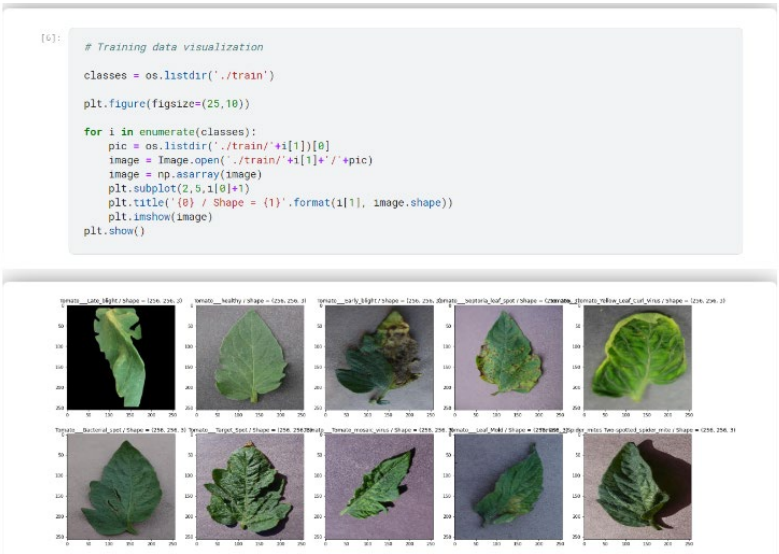
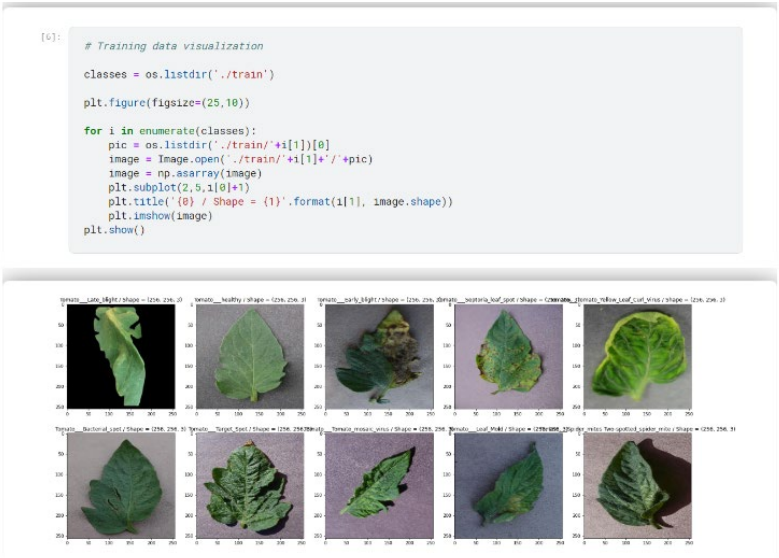
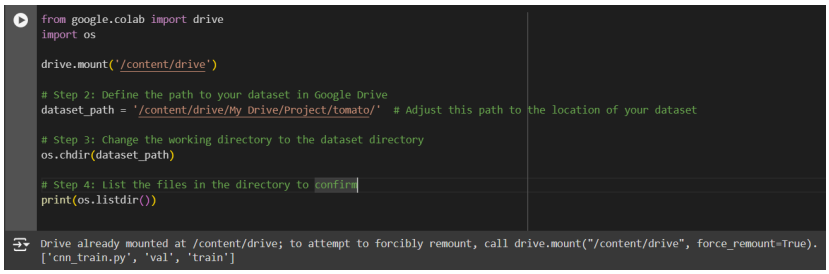
Edge Detection	[6]: ``` # Training data visualization classes = os.listdir('./train') plt.figure(figsize=(25,10)) for i in enumerate(classes): pic = os.listdir('./train/'+i[1])[0] image = Image.open('./train/'+i[1]+'/'+pic) image = np.asarray(image) plt.subplot(2,5,i[0]+1) plt.title('{0} / Shape = {1}'.format(i[1], image.shape)) plt.imshow(image) plt.show() ``` 
Color Space Conversion	[6]: ``` # Training data visualization classes = os.listdir('./train') plt.figure(figsize=(25,10)) for i in enumerate(classes): pic = os.listdir('./train/'+i[1])[0] image = Image.open('./train/'+i[1]+'/'+pic) image = np.asarray(image) plt.subplot(2,5,i[0]+1) plt.title('{0} / Shape = {1}'.format(i[1], image.shape)) plt.imshow(image) plt.show() ``` 

Image Cropping	
Batch Normalization	

Data Preprocessing Code Screenshots

Loading Data	from google.colab import drive import os drive.mount('/content/drive') dataset_path = '/content/drive/My Drive/Project/tomato/' os.chdir(dataset_path) print(os.listdir())

	
Resizing	Give the code snippet as an image (copy and paste the picture in this block).
Normalization	Give the code snippet as an image (copy and paste the picture in this block).
Data Augmentation	Give the code snippet as an image (copy and paste the picture in this block).
Denoising	Give the code snippet as an image (copy and paste the picture in this block).
Edge Detection	Give the code snippet as an image (copy and paste the picture in this block).
Color Space Conversion	Give the code snippet as an image (copy and paste the picture in this block).
Image Cropping	Give the code snippet as an image (copy and paste the picture in this block).
Batch Normalization	Give the code snippet as an image (copy and paste the picture in this block).