Semester	V
Subject	Software Engineering
Subject Professor Incharge	Prof Sneha Annappanavar
Assisting Teachers	Prof Sneha Annappanavar
Laboratory	

Student Name	Nilesh Lad	
Roll Number	20102B0010	
Grade and Subject Teacher's Signature		

Experiment Number	5	
Experiment Title	Prepare SRS for the Mini project	
Resources / Apparatus Required	Hardware: laptop with good configuration	Software: Jupiter notebook

FLOWER RECOGNITION SYSTEM SRS

1) INTRODUCTION:

There are many flower species in the world. Some species have many colors, such as roses. It is hard to remember all flower names and their information. Furthermore, someone may be confused with similar flower species. For example, white Champaka and Champak have similar names and petal shapes but they have different colors and petal lengths. At this time, it is almost impossible to identify particular flowers or flower species in any other way but to seek information based on personal knowledge and experience of experts. Availability of such experts may be a barrier to such information seeking. Searching for such information on the Internet is, today, very much restricted to key word searching; text processing. Even in this the searcher needs to provide sufficiently useful keywords, which they cannot do, which is the crux of the matter. This paper gives another approach to flower and plant recognition and identification; one based on image processing. Using image processing methods, people who want to know flower and species information could do so by taking photos, probably using a smart phone, but also a digital camera, or using a photo from the Internet. These photos can then be input into the image processing system proposed here and identified by the system.

1.1) PURPOSE:

It is useful to identify flower type in various fields such as gardening, botany research, ayurveda, treatment, farming, floriculture etc. The similarities and differences highlight the difficulty of identifying each flower species automatically. Traditional flower recognition task is doneby a botanist. Many challenges are facing botanist through flower recognition task. Hence propose of the model to classify the flowers using python.

1.2) SCOPE:

Based on the comparative result there are some future research directions such as we can apply the classification process on big data with the combination of parallel computing because with the increase of the size of the data set or training set we can achieve more accurate

classification which can help to generate more accurate flower recognition result.

1.3) DEFINITION, ACRONYMS, ABBREVIATION:

The flower recognition system based on image processing has been developed. This system uses edge and color characteristics of flower images to classify flowers. Flower recognition is a very tedious task because of their existence in wide varieties of color and shape. Being able to identify a flower without the need of an expert botanist would be a great help for industries including pharmaceuticals and cosmetics. Due to this a lot of research has been done on this topic. Color is one of the most distinguishing features in a flower.

2) OVERALL DESCRIPTION:

2.1) PRODUCT PRESPECTIVE:

The proposed flower recognition system is implemented by developing a convolutional neural network which is a very efficient model for image classification. CNN models are trained by initially feeding a set of flower images along with their labels. These images are then passed through a stack of layers including convolutional, ReLU, pooling and fully connected layers. These images are taken as batches. In the proposed system, a batch size of 150 was given. The model was trained using 70 epochs. Initially the model extracts small features and as the training process progresses more detailed features will be extracted. Most of the preprocessing is done automatically which is one of the major advantages of CNN. In addition to that input images were resized. Augmentation is also applied which increases the size of the dataset by applying operations such as rotation, shear etc.

2.2) SOFTWARE REQUIREMENT:

- Jupyter notebook/Google colab
- Data set

2.3) HARDWARE REQUIREMENT:

4GB RAM
4.1 GHz processor
Intel i5
Windows 10/11 (for better performance)

3) IMPLEMENTATION:

The proposed system was implemented as follows:

Step 1: Image acquisition: This step involves collecting images that can be used to train the model so that later when it comes across an unknown image, it can identify the flower based on the knowledge acquired during the training phase.

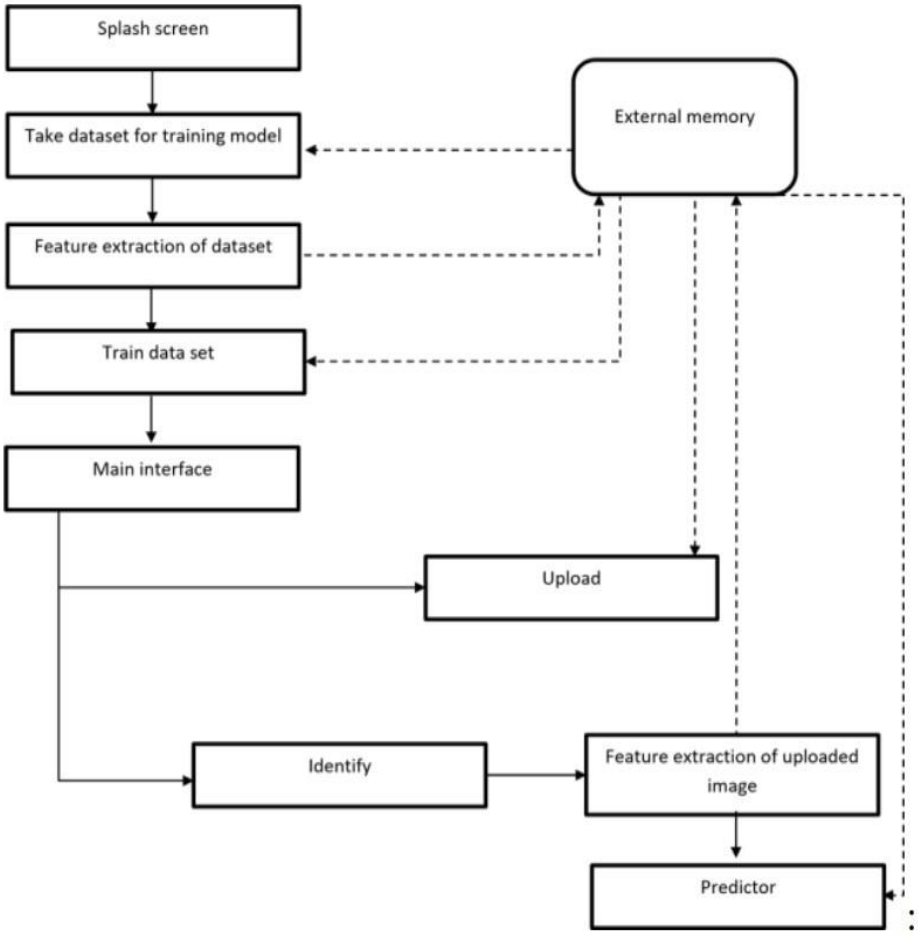
Step 2: Image Preprocessing: Here the images collected in the previous step were resized and augmented to increase the efficiency of the model. During augmentation, the size of the dataset would be increased by performing operations such as rotation, shear etc. Then the image will be split into 75% training and 25% testing sets.

Step 3: Training Phase: This is the step where the actual training of the model takes place. In this phase the model extracts features such as color and shape of the flower used for training. Each of the training images will be passed through a stack of layers which includes convolutional layer, Relu layer, pooling layer and fully connected layer.

Step 4: Validation phase: Once the model completes its training from the training set it tries to improve itself by tuning its weight values. The loss function used is categorical cross entropy and the optimizer used is stochastic gradient descent.

Step 5: Output prediction: Once the validation phase is over, the model is ready to take an unknown image of a flower and predict its name from the knowledge it gained during training and validation phases. Once the classification is done by the model, it displays the common name as well as the family name of that flower.

4) FLOW DIAGRAM:

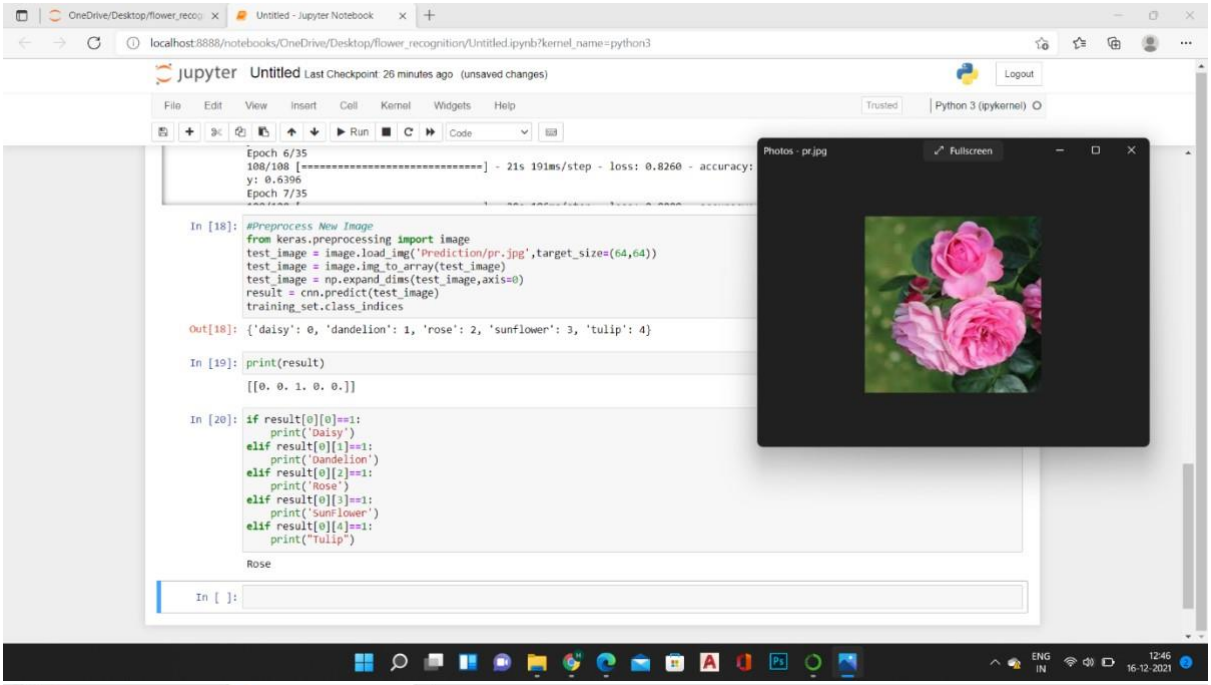


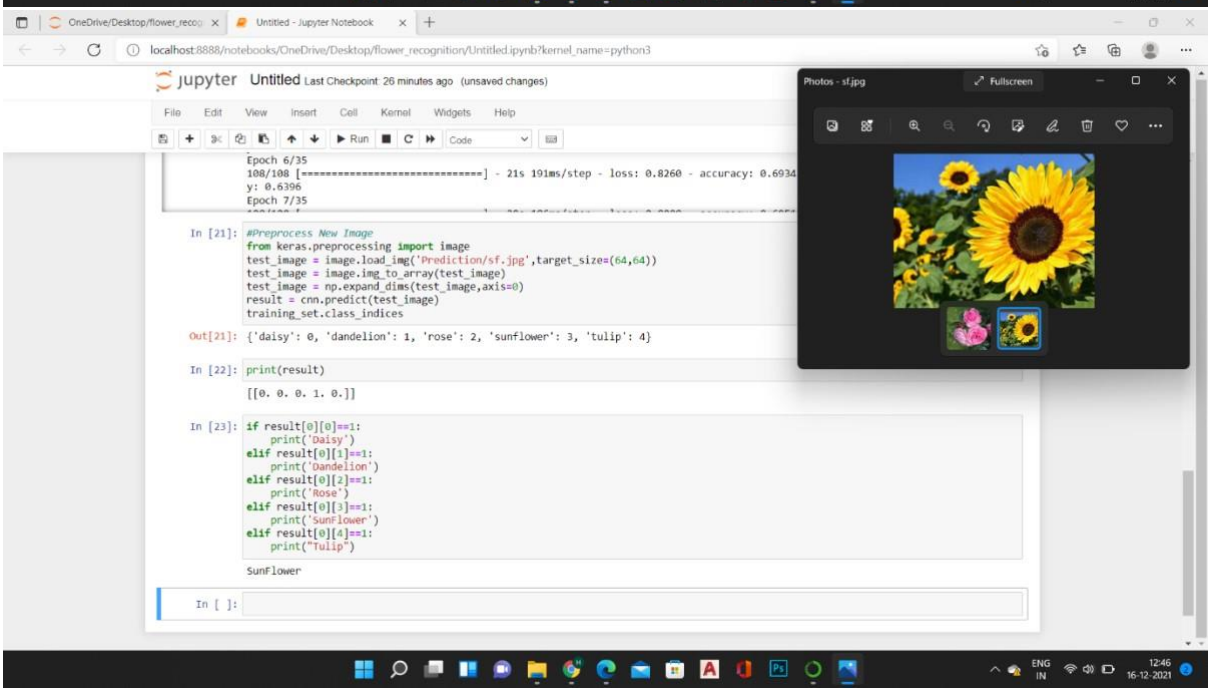
5) DATASET:

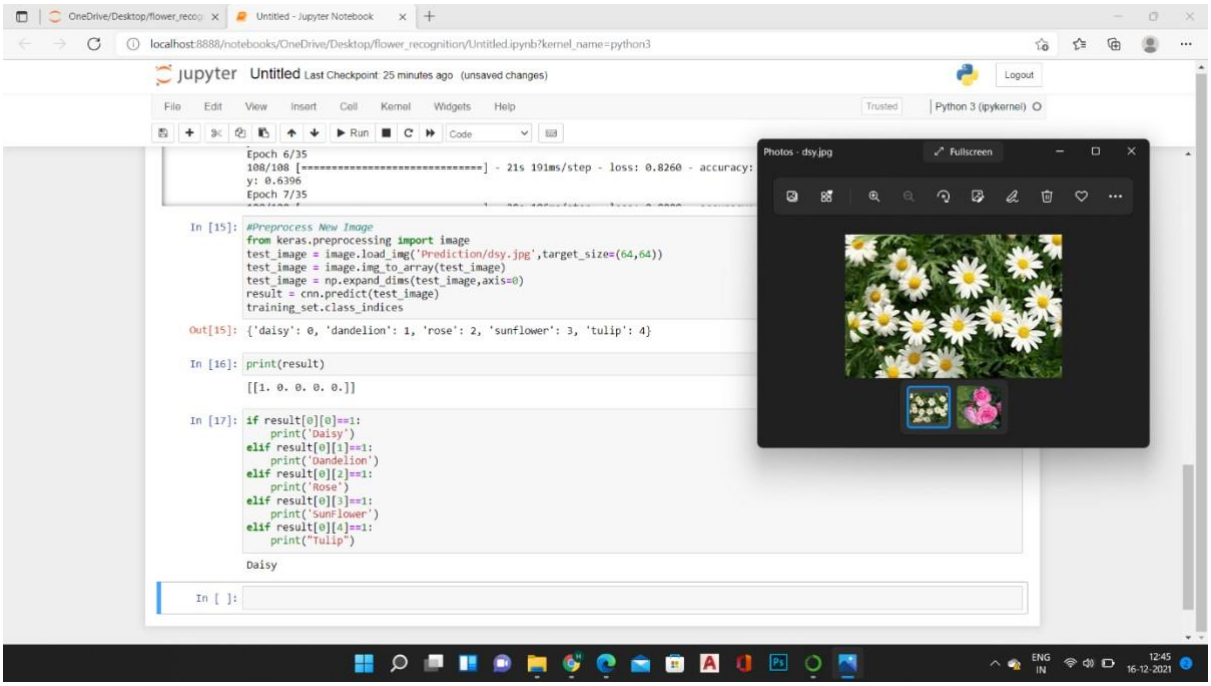
This dataset contains labeled 4252 images of flowers. The pictures are isolated into five classes: Daisy, Tulip, Rose, Sunflower, Dandelion. For each class there are around 800 photographs. Photographs are not high goal, about 320x240 pixels. Photographs are not diminished to a solitary size, they have various extents.

6) RESULT AND ANALYSIS:

Prediction of flowers according to their names:







7) REFERENCES:

[1] Tiay, T., Benyaphaichit, P., &Riyamongkol, P. (2014, March). Flower Recognition System Based on Image Processing. Student Project Conference (ICT-ISPC), Third ICT International, 99-102. IEEE.

[2] FadzilahSiraj, Muhammad AshraqSalahuddin and ShahrulAzmiMohdYusof ,"Digital Image Classification for Malaysan Blooming Flower" IEEE-2010.

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