EE5353 Program Assignment 6

Character Recognition using Convolutional Neural Networks using Keras using Google Colab

In this assignment we will classify character data such as 0-9, A-Z (except for O and Q). The character images will be provided to you in the link below.

Steps for this assignment

1. We will input the character images, convert into proper format to be used with the keras convolutional neural network (code will be provided).
2. Divide the data into training(80%) and testing(20%) (Provided in the code).
3. Images are resized to 28 by 28 and are saved in an array(Provided in the code).
4. Labels are converted to proper format using the name of the folder. Similar the reverse is used while printing testing results(Provided in the code).
5. Design a Convolutional neural network similar to program 6 but some parameters have to be changed ***(Students need to complete this part of the assignment)***

   It should have the following layers

   - Convolutional layer with 32 filters, Size of the filters is 5, 5 and relu activation
   - Pooling layer with pool size 3,3
   - Dropout layer with rate 0.35
   - Flattening
   - Dense layer fully connected with 64 hidden units and relu activations
   - Dropout layer with rate 0.35
   - Final dense fully connected layer with number of classes and softmax activation.

6. Verify if the number of iterations/nb_epochs = 10(Provided in the code).
7. Testing the images using the testing data(Provided in the code).

The link to the Character Images is below. Kindly download and put it in your google drive folder

➔ **https://drive.google.com/open?id=12lSLauYdYPIJEcaFjSs9oVXtKTTjqeyi**

Kindly have the images in the drive as follows 'My Drive/Colab Notebooks/Character Images' . here My Drive should be common for everybody. '/Colab Notebooks/Character Images' is example of how my images are saved. If you have a different folder you need to adjust line 53 in your ipynb (if you cannot see line number go to Tools -> settings -> editor -> check show line numbers)

The Code link is as follows

https://colab.research.google.com/drive/1KDJ-tXKqHR5YafdcC5ajfnch3MJsZS-u

Google colab File -> Save a copy in the drive. The code will be provided in the zip too

The code to input images of each class is given in line 70 to 87 (please do not change the name of the folders as the labels are created using the folder names)

Go through the GoogleColab_Instructions.doc on how to run the given python code in google colab. Insert the following Python notebook (Character_Recognition.ipynb) in your google drive Colab folder as discussed in the instructions document.

Links for the convolution layers, pooling, dense, dropout

https://keras.io/layers/convolutional/

https://keras.io/layers/core/ (this has dropout too)

https://keras.io/layers/pooling/

Note - Folder for O and Q is missing**