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Admission number: U19CS009

CV-ASSIGNMENT-02

Write a program in your preferred programming language for histogram equalization of any grayscale image. You can take a grayscale image having low contrast of your choice.

CODE :

```python
# U19CS009
# Brijesh Rohit

import numpy as np
from PIL import Image

#INPUT AND OUTPUT FILE NAME
in_name='input.jpeg'
out_name='output.jpeg'

#LOADING THE IMAGE FILE
img=Image.open(in_name).convert(mode='L')

#CONVERTING THE IMAGE TO ARRAY
img_arr=np.asarray(img)

#CREATING HISTOGRAM ARRAY
#BINCOUNT COUNT OCCURANCE OF ELEMENTS
#FLATTEN CONVERTS THE MATRIX TO 1D ARRAY
histogram_arr=np.bincount(img_arr.flatten(),minlength=256)

#NUMBER OF PIXEL IS EQUAL TO SUM OF ALL OCCURANCES
n_pixel=np.sum(histogram_arr)

#NORMALISATION
histogram_arr=histogram_arr/n_pixel

#CUMULATIVE HISTOGRAM AFTER NORMALISATION
cumu_histo_arr=np.cumsum(histogram_arr)

#MAKING A LOOK UP TABLE/MAP
trans_map=np.floor(255*cumu_histo_arr).astype(np.uint8)

#CONVERTING TO 1D LIST FOR EQUALISATION
img_list=list(img_arr.flatten())
```

```
#TRANSFORMATION OF VALUES TO EQUALISE
equa_list=[trans_map[p] for p in img_list]

#RESHAPING BACK TO SHAPE OF IMG_ARR
equa_arr=np.reshape(np.asarray(equa_list),img_arr.shape)

#WRITING IT TO IMAGE FILE AND SAVING IT
final_image=Image.fromarray(equa_arr,mode='L')
final_image.save(out_name)
```

IMAGE BEFORE NORMALIZATION :

IMAGE AFTER NORMALIZATION :