Lab:4

## Guide:

I have used functional approach to solve all the tasks all function are defined and called in zLab4.py

Running this file will using python 2 will generate all output image in same directory. Provided B1.png, B2.jpg B3.jpg and XY-cutss.png are available in the directory

# Code

import PIL

import numpy

from PIL import Image

import matplotlib.pyplot as plt

#task-1 Function

def thresholdConversion(source,destination, threshold):

im = Image.open(source).convert('L')

grarray = numpy.asarray(im)

bw = (grarray > threshold)\*255

output = PIL.Image.fromarray(numpy.uint8(bw));

output.save(destination);

#task-2 Function

def intensityHistogram(source,destination):

image = Image.open(source).convert('L')

grarray = numpy.asarray(image)

hist = [0 for i in range(256)];

for x in grarray:

for y in x:

hist[y] = hist[y]+1;

a=numpy.transpose(hist)

plt.bar([i for i in range(256)],hist)

plt.savefig(destination);

#task-3 Functions

def X\_Y\_cut(source, destination, lower\_cross, upper\_cross):

im = Image.open(source).convert('L');

grarray = numpy.array(im);

# bw = (grarray > 100)\*255;

for x in range(len(grarray)):

for y in range(len(grarray[0])):

if grarray[x][y] < 100:

grarray[x][y] = 0;

else:

grarray[x][y] = 255

PIL.Image.fromarray(grarray).save("test.png");

hist = [0 for i in range(im.size[1])];

index = 0;

# print bw

for x in grarray:

for y in x:

if(y == 0):

hist[index] = hist[index]+1;

index = index+1;

# print hist

plt.bar([i for i in range(im.size[1])], hist)

plt.savefig(destination+'graph.jpg');

point = [];

check = True;

index = 0;

index2= 0;

for x in hist:

if x > upper\_cross:

check = True;

if check == True and x < lower\_cross:

check = False;

point.append(index2);

index = index +1;

index2 = index2+1;

sub\_images(point, im, destination);

def sub\_images(point, im, destination):

for x in range(len(point)-1):

print x

box = (0, point[x], im.size[0], point[x+1]);

region = im.crop(box);

# print(destination+"x\_y\_lines"+str(x)+".jpg");

region.save(destination+"\_line\_"+str(x)+".png");

#task-1

thresholdConversion("B1.png", "B1\_task\_1.jpg", 170);

thresholdConversion("B2.jpg", "B2\_task\_1.jpg", 120);

thresholdConversion("B3.jpg", "B3\_task\_1.jpg", 50);

#task-2

intensityHistogram("B1.png", "B1\_task\_2.jpg");

intensityHistogram("B2.jpg", "B2\_task\_2.jpg");

intensityHistogram("B3.jpg", "B3\_task\_2.jpg");

#task-3

X\_Y\_cut("XY-cutss.png", "Task\_3\_", 20, 100);