Image processing project - automated detection and marking of barcode in an image.
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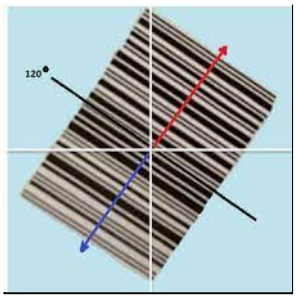
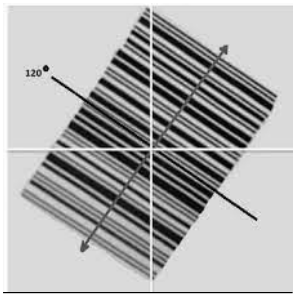
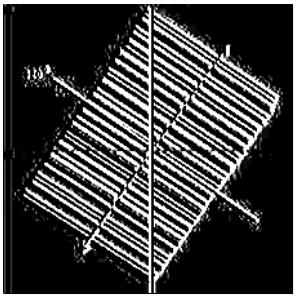
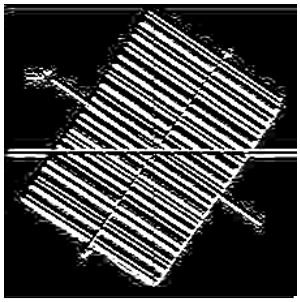
Load the image in which you want to find the barcode. If it is a non gray scale image, convert it to gray scale.
Images are converted to grey scale because for our case we dont need RGB values and mean absolute values is enough.



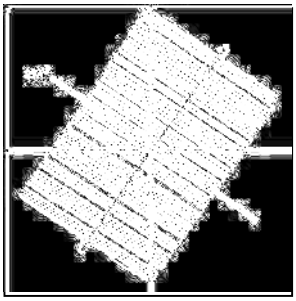


Now we calculate the gradients in the x axis and y axis. In applications like identifying barcode, gradients play a huge role as they measure how the image is changing. unlike the other part of the image, a barcode is identified by fast change in pattern, hence its good to use gradient as a feature. Sobel operator is used because of its simiplicity and speed, it however has lesser SNR as compared to Canny edge detector.

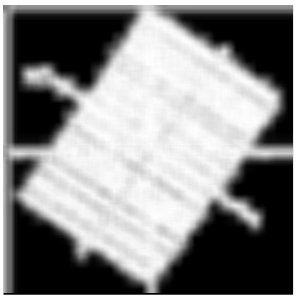




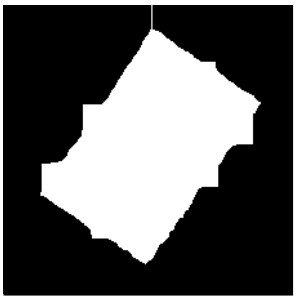
These values are processed by subtracting them and then calculating the mean absolute value.



The values are then smoothened by using the blur operator (average kernel), thus removing the still remaining high frequency component. Other blurring techniques can also be used like gaussian blur, median blur. Then the image is threshold to binary form. Thresholding is a step to select the area of interest in the image.



The area selected still has some other elements also selected. Hence erosion followed by dilation is done to remove the smaller elements.



Then cluster selection algorithm is applied and the largest selected cluster(by area) is selected as the barcode section in the image.