CS373 Barcode Detection Assignment

The extension to my assignment was that I modified my code to detect multiple bar codes in each image.

I included this code in the extension.py file, which was mostly based of my Assignment, but I changed the function that returned the box I was supposed to draw to return all the boxes that included bar codes.

The way I did was looping through all my components and filtering them to see what had the correct criteria. I had to exclude the part where I check if the ratio between the length and width is above a certain threshold. I excluded filtering components by the ratio because in the following image, the bar codes at the bottom of the image had significantly different ratios to the bar codes on the products.

Here is an example of the program detecting multiple bar codes:

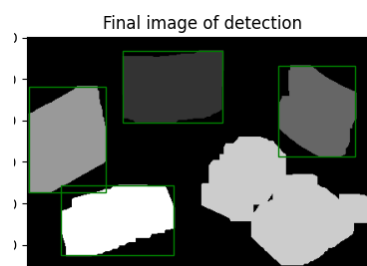It was able to detect the bar codes but in one instance include more than just the bar code.

Limitations

It couldn't detect hidden bar codes and mistook similar shaped objects for bar codes like:

This was because, the bar codes that were not in distinctly visible in picture were interpreted as one single component during component counting.

This the following is the image after connected component analysis is run:

The method to detect bar codes discarded this component as it was of an irregular shape and did not result a typical bar code. Hence, the extension struggled with obscured bar codes.

Another limitation of the extension was that the program would only select a portion of the bar codes. In the image below, the bar codes are close and the gaps between the bars were more pronounced. This led to splitting the bar code into two or more bar codes.

Additionally, when reading and grey scaling the image, only a portion of the bar codes remained. This could be because of the limited colour range of the image. Since portions of the bar codes were discarded during pre-processing, they couldn't be detected. Text was also interpreted as bar codes because I had to remove the check if a component had a certain ratio as explained above. Text was detected as it has a similar density to bar codes.

The following is the image after grey scaling the original image: