

## Lab 4 Report

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1. First, the area is computed by counting each pixel that is part of the object selected by click. A pixel is part of the object if it has the selected object's color intensity.
2. Center of mass is computed using the formula presented in the laboratory and is shown in an additional picture.
3. For the elongation axis computation i used the formula from the laboratory. The function will output the angle in radians. For the console output i converted the angle from radians to degrees. I also output the result in the additional image for visual demonstration, using the line function that uses two points to draw a line from one point to the other. I use the center of mass and a length of 100 in the angle of elongation. Here, initially, i converted the radians to degree first and i used that value for the drawing of the elongation axis. I changed it then so the output is now correct, as it can be viewed from the additional image.
4. The perimeter is computed by counting the number of pixels on the contour of the object, knowing the outer pixels are pixels of value 1 that have at least one neighbor pixel of value 0. Here I didn't write correctly the conditions and switched a row with a column by mistake so first it wasn't correct but then, with some help, i corrected it. Then using the same method i drew the objects contour on the additional image.
5. Thinness is computed using the formula from the lab, as well as the aspect ratio.
6. For the bounding box i computed the maximum row, column and the minimum row, column, just like for the aspect ratio and i used the line function to draw the bounding box with 4 lines by using the values computed: rmin, rmax, cmin, cmax. Here i mistakenly switched the rows with the columns for the points used in line function and the bounding box wasn't correctly placed around the chosen object.
7. For the projection, i have  $H[r]$ , which represents the number of pixels from the object chosen that belong to row  $r$  in the image. So for the columns for each  $c=0, H[r]$ , each pixel is colored in the additional image with the color of the pixel from the object chosen. Same for  $V[c]$ , which represents the number of pixels from column  $c$ . Each pixel is colored for each  $r=0, V[c]$ .