1-For the circled structuring element, the circle will be smaller, and the corners will be rounded.

For the squared structuring element, the circle is changed a little, and the corners are not rounded as when we use the circled structuring element.

3- Dilation can also be used for edge detection by taking the dilation of an image and then subtracting away the original image, then highlighting just those new pixels at the edges of objects that were added by the dilation.

4-For the circled structuring element, the hole in the middle of the image increases in size as the border shrinks.

When we then applied the squared structuring element the hole shape changed slightly to a square shaped,

6-The observation is that unless we perform dilation on the image after the erosion, the noise will not be removed completely, but it will just be reduced, also the salt noise isn’t cleared completely.

7-a-We have used a structural ellipse element with diameter of 11 pixels and opening to separate the circles.

Using number smaller or greater than 11 doesn’t do the separation accurately.

\*When we experimented a square, some of the circles converted into square, and some doesn’t appear.

\*To separate the lines we subtracted the separated circle image from the original image, then we eroded the original image in order to get the lines separated.

\*The drawbacks of this method is that some very little parts of the circles are lost, and that the lines have gaps.

7-b

To count the number of circles, we used contours, specifically the function findContours, where we gave it a copy of the circles only image, and it returned an array of contours, where its length is the number of circles.

To count the lines, we also used the contours, but approximately divided its length by 2 due to the separations in the lines.

9-We can transform the output to be general, by sorting the areas, and then grouping the areas numbers that are closer to each other together in one group (array for instance), then check if the area is in a group, mark its boundaries with a distinct color.