CSCI - 631 POISON IVY
CHECKPOINT 04

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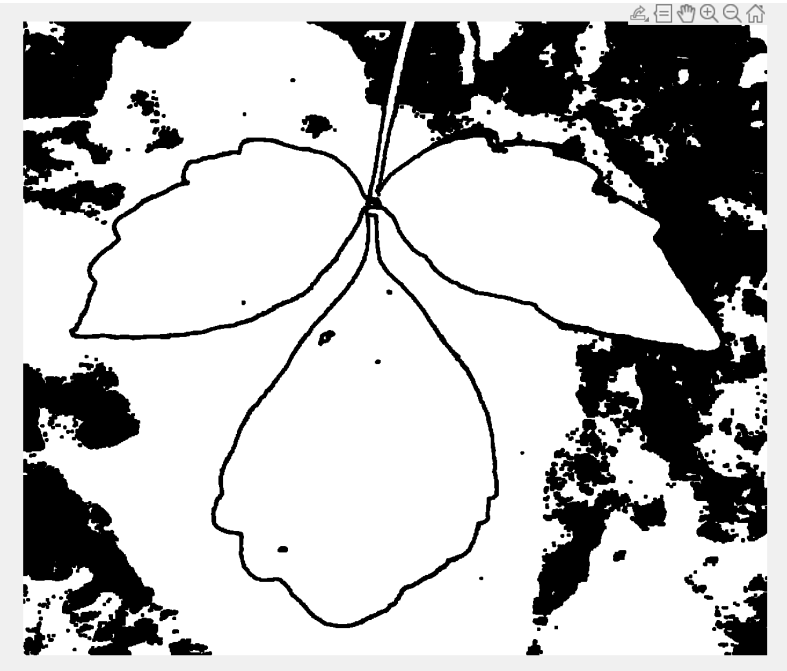
In this checkpoint, our goal is to get the shape of the leaf. Previously, we were able to isolate the leaf from the background which was present in the center of the image. This can be seen from the following image:

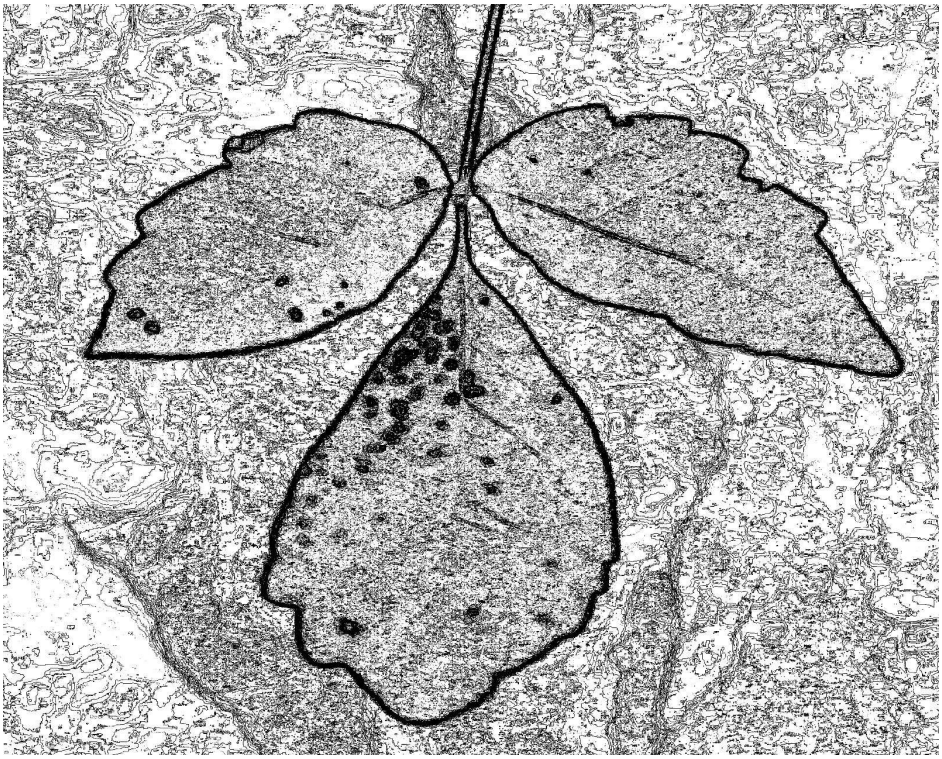


Firstly, we wanted to get rid of the background noise and then retain the shape of the leaf. For this, previous homeworks was really useful for us. We learnt a bunch of new concepts in the previous couple of weeks and were able to implement those in our homeworks. Now, we used the same in our project.

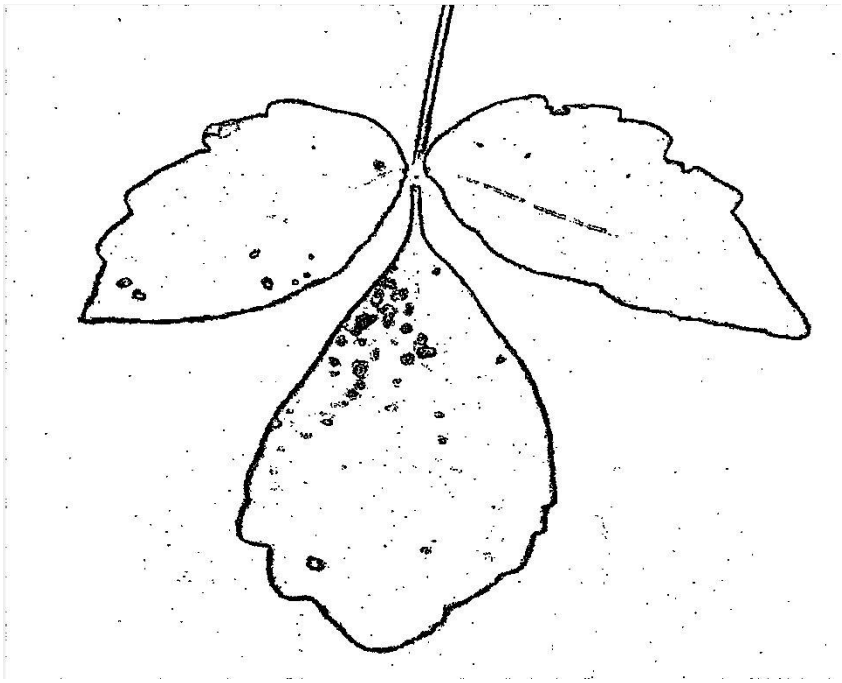
These are the following steps for getting the shape of leaves in the image:

1. We cropped the center of the image, as the poison ivy leaves are always located in the center of the image. This was a good step towards the background noise reduction as after we crop the image, we have less noise to reduce.

2. As done in previous checkpoints, we used a- channel of La*b* color space to isolate the image from the background and used the grayscale version to process the image further.
3. After cropping the image, we applied a Sobel filter using imfilter() function. This gave us the filter magnitudes for x and y directions which will gradually give us the final edge magnitude.
4. We got the cutoff value from the edge strength histogram which was helpful to determine the edge strengths of the background as compared to the edge strength of the center leaves.
5. To determine the modal color of the leaves was a bit challenging for us. We then decided to use Mahalanobis distance to separate the leaf color from the background color. In this way, we got the modal color of the leaves in the center.
6. By applying logic from the previous homework, we performed operations to add these things (edge strengths and modal color of the leaves) which gave us the following image:



7. After performing morphology operations on the previous output image, we were able to extract the final shape of the image. This can be seen in the following image:



When performed the same operations on some another image: