For this assignment I was able to successfully complete it on time, although I spent a good amount of time on it attempting to make sure it was correct as I encountered a few issues. One of the biggest obstacles that I faced was rotating the image. I kept having an issue where it would rotate 90° when the rotatePGM function was called the first time but when it was called a second time, it would either keep rotating or flip the already rotated image horizontally. In order to overcome this, I stored the values of the original matrix inside of the rotate function so that the program always has a reference point when doing more rotation/transposing. I figured that given that this function is only called twice that this was something that I could do but I know that in future instances I don't think I would be able to write the code in the same way. I also set up some if-else statements that figures out if rotate has been called already so it does not attempt to rotate it again but instead relies on the information taken in from the original matrix to flip it. I was also getting an error when I was first attempting to read the file but re-downloading it resolved it. Lastly, one of the issues that I faced that may seem small to some but confusing to me was keeping track of the variables that are being passed around. It took me longer that I would like to admit to make sure that my program was referencing the correct pointers and variables but eventually I was able to figure it out. Rotating twice gave me the original image and an upside down one because in my first rotation I am swapping the values "i" and "j" within the inner for loop and the subtracting by "i" against the width the first time and the second time I am subtracting in a correct order that is based off the original matrix. If I had not stored the value of the original matrix and also did not include an else loop I think my picture

would have been flipped upside down given I am sending back the updated matrix each time.

      For my references, I utilized Microsofts documentation on C to help understand different functions that I didn't fully understand. I also used geeks for geeks and google to help me understand what thresholding an image means because I really did not initially understand what it was and what it was doing.

Threshold.pgm

Rotate.pgm

Rotate_Again.pgm