

## Daily Log

Detail for each day about what you researched, coded, debug, designed, created, etc. Informal style is OK.

### Monday September 9

Worked on truncate method, which takes matrix of ones and 0s and removes rows and columns of all zeros (essentially, removes the “white space” of an image of an object) to allow for easier packing. Had to create separate methods for truncating rows and columns. Initially had some issues and errors, and runtime was lengthy, but found some issues and fixed.

### Tuesday September 10

Worked on truncate method more, and was able to fix the errors from last time. Created a computationally expensive way to check if a matrix can be placed in another matrix by iterating across its elements and checking if there is any collision. Created method that turned an array of image file names, angles to rotate, and scaling parameters into a map of the file names and matrix representations. Used this and Boolean method to create first attempt at packing method. Packing method spent a while running.

### Thursday September 12

Found error in packing method causing infinite loop, fixed. Modified packing method slightly. In order to preserve run time, made a method that converts arrays to forms where everywhere other than edges of object are zero, and edges put the thickness of the object in that location. This allows objects to be packed quicker because it just has to check edges. Had a few errors in this method that need to be resolved. Also began to change packing method to incorporate this change.

## Timeline

Date	Goal	Met
August 30th	Wanted to learn how to use pillow and image processing so I could work on pixelating images the following week	I did learn enough to do so
September 6th	Last week I wanted to be able to generate a black and white pixelated form of an image given an image of an object with a white background	Was able to get accomplished, also was able to convert to matrices
September 13th	I wanted to be able to create several rotations of several images and convert them into arrays using only one method. I also hope to be able to insert an array of integers inside of another array of integers so I can begin the process of using the matrices to represent ways to stack the objects	Was able to insert arrays into other arrays, and created a method that allowed checking if able to do so
September 20th	I hope to be able to specify a column in a matrix representing a packing container and have my code place an object in the optimal position and rotation in this column	
September 27th	I hope to be able to begin work on method that efficiently finds the optimal rotation of an object by initially testing out several rotations of each object and then progressively gets closer to the optimal rotation through these tests	

## Reflection

Throughout this week, I introduced many new methods to my program that I did not initially think of adding. The “truncating” method that I programmed on Monday and Tuesday was one such addition, as I realized that it would prevent an error to be caused when the white space of an image is “cut off” from the packing container but the original image is not. An obstacle will be to figure out where to place the initial image files when I try to convert the matrix back into an image, as I do not truncate the original image files, so they are different sizes than their matrix representations. Additionally, the idea to just represent edges and thicknesses in the matrix I came up with on Thursday, because it will reduce the number of positions the packing method has to check for each object. I think this will have a large effect on the run time.

So far I have begun to address obstacles related to algorithm’s efficiency and how to effectively rotate and pack images that I did not initially outline in my proposal. The thickness matrix thing that I am trying to accomplish should be very beneficial for run time, although it still needs work (I’m unsure about the errors I have with it). I am happy that I’m moving to a point where I can

start testing things out and coming up with ideas instead of just grinding out methods that I had already planned beforehand. I am happy about the pace things are moving at.