Daily Log

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

Monday November 11th

Found another slight error in packing method. Fixed this error - now packing is working as intended! Tried and successfully packed several objects in a single period. Used fairly pixelated versions of objects to speed up run time - could pack 10 pixelated objects in a single period, accomplishing one of my goals.

Tuesday November 12th

Began testing different images to see where algorithm fails. The algorithm takes *much* more time with larger images, which makes sense as the image-to-array methods are $O(WH)$, where W iand H are the width and height, respectively. Additionally, how pixelated an image is also has a large affect on the algorithm, as if there are n times as many pixels per some unit of measure in one image than in another, then the algorithm takes n^2 times as long to run.
I had to leave early for a college interview.

Thursday November 14th

Began testing more data sets. It appeared that skinny objects in particular were not packed well. This likely has to do with the fact that initially the code only checks 0, 120, and 240 degree rotations, and skinny objects are often packed best in 180 degree rotations. This means this needs to be changed in order for them to pack better.

Timeline

Date	Goal	Met
October 3rd	I hope to program the method found in the previous week	I did not program any method, but came up with several that would pack objects quickly and would be plausible
October 17th	I hope to be able to pack objects correctly and display an image of it	I haven't accomplished this yet
November 11th	I hope to be able to pack 10 objects in a single class period	I haven't been able to create correct packings yet, but given the current run time of my code this should be very achievable
November 18th	I hope to be able to pack objects correctly and have rotated objects be exactly the same size as the original object	I accomplished both
November 25th	I hope to be able to speed up my algorithm to the point that I can pack 40 objects correctly in a class period	
December 2nd	I hope to be able to speed up my algorithm to the point that I can pack 100 objects correctly in a class period	

Reflection

I finally got my packing method working correctly! An example packing is shown below:
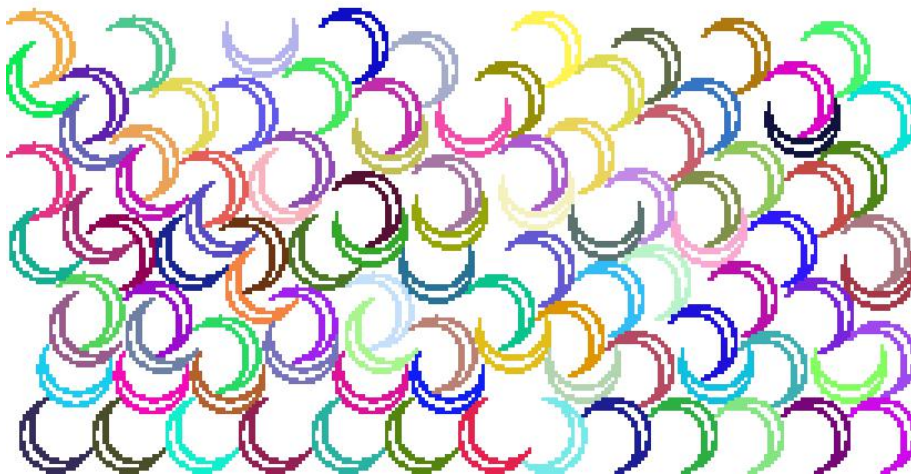
For the next few months, I'm going to work on making this code better. The two things I'm trying to improve are the time the algorithm takes to run and the quality of the packings it gives.

Since the packings it currently gives already look pretty good, I will focus primarily on reducing time right now. There are two modifications I'm thinking about doing right now:

- Modifying program so large images are scaled down before any methods are ran

- Initially checking more rotations for each object before selectively narrowing down on the best rotation

These help reduce time and improve the quality of packings given by the algorithm, respectively. One way to test efficiency is to find a set of objects and pack them based on different algorithm modifications to see which modification is the best. Therefore, in order to test efficiency in the next few weeks I will likely have many image comparisons. I can quantify the strengths of different algorithms by the height of the pile of objects they give, with smaller heights being given by better algorithms.