

## Project 1

This project is strongly heuristic based. There are many parameters especially for the simulated annealing algorithm that take values largely dependent on the implementation. For my implementation, I began with a very large number ( $\sim 1000000000$ ) for the starting temperature, and a small value ( $\sim 10$ ) for the final temperature. For number of steps, I initially chose 10. Lastly, for the cooling schedule, I chose an exponential decay pattern where each iteration, the temperature is multiplied by factor of 0.99.

Ultimately, these values changed to allow better performance. I kept the freezing temperature at 10 and the cooling factor at 0.99. However, I changed the initial temperature and steps per iteration to be dependent on the input size. Specifically, the initial temperature is  $100000 * \text{input size}$  and the steps per iteration is simply the input size. These parameters were chosen through experimentation to give the best balance of black area percentage and run time for all input sizes.