John Heiden City Assignment Writeup

1. I used Cellular Automata for the generation of the buildings and an extremely simplified version of A\* to generate the roads.
2. I modified an A\* algorithm I wrote for a homework assignment in a different class to use only a Manhattan Heuristic to find the best path to its goal. I also do not store the cost values of each cell.
3. I made a city that is akin to NYC with large skyscrapers scattered across the whole area and plentiful traffic.
4. The generation of building verticality and cars was ad hoc. The buildings just choose a random height for themselves and build blocks upward until that height is reached. The cars have a random chance to spawn on any road block and if they do spawn then they receive a random color.
5. The biggest problem I ran into was figuring out how to extend cellular automata into 3 dimensions. My first thought was to try implementing the algorithm in 3 dimensions, but I quickly realized that wouldn’t be ideal since the only verticality I wanted in my city was tied to buildings. This led me to decide to simply add height to buildings after they were generated since that could still be done procedurally and would lend itself to the skyscraper theme I was going for.
6. All assets are made by me.
7. To extend this project, I would want to add code to generate quads in random parts of each face of each building block to have randomly lit windows in each building. If that proved to be a bit intensive on the number of verts generated, then it would suffice to just have different block arrangements that can be randomly assigned as the buildings are built up. It would also be interesting to implement cars driving on the roads since the roads are designed to be connected every time they generate.