Assignment 00: Martian Squirrel City Simulator

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Approach

- Step1: Input images to short[][]
- Step2: Run loop to obtain x, y of best city
  - Generate random coordinates
  - Put city and level terrain
  - Check cost
  - If cost < bestCost, save new best x, y
- Output new terrain image

City Placing

```
double total=0;
for (int i=0;i<500;i++)
        for (int j=0;j<500;j++)
                total+=terrain[x+i][y+j];
cityLevel=(short)(Math.round(total/(500*500)));
for (int i=0;i<500;i++)
        for (int j=0;j<500;j++)
        {
                terrain[cityX+i][cityY+j]=cityLevel;
                touched[cityX+i][cityY+j]=true;
        }
for (int i=0;i<255;i++)
        levelPerim(i);
```
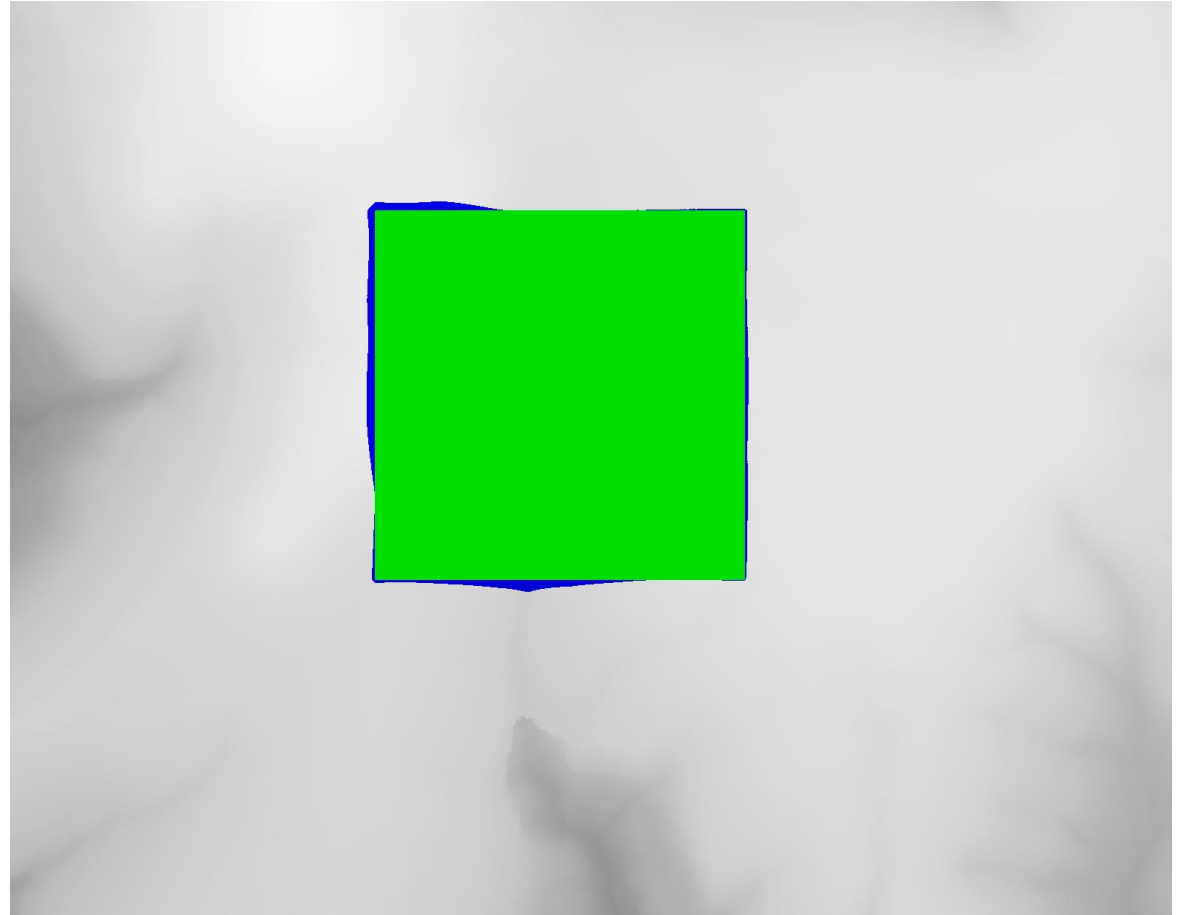
Results

- The program was run and the optimal city was searched for for 45 seconds.
  - Iterations of placing cities: 173
  - Cost: 1,156,682 acorns
  - Times a new solution was found: 4

Images
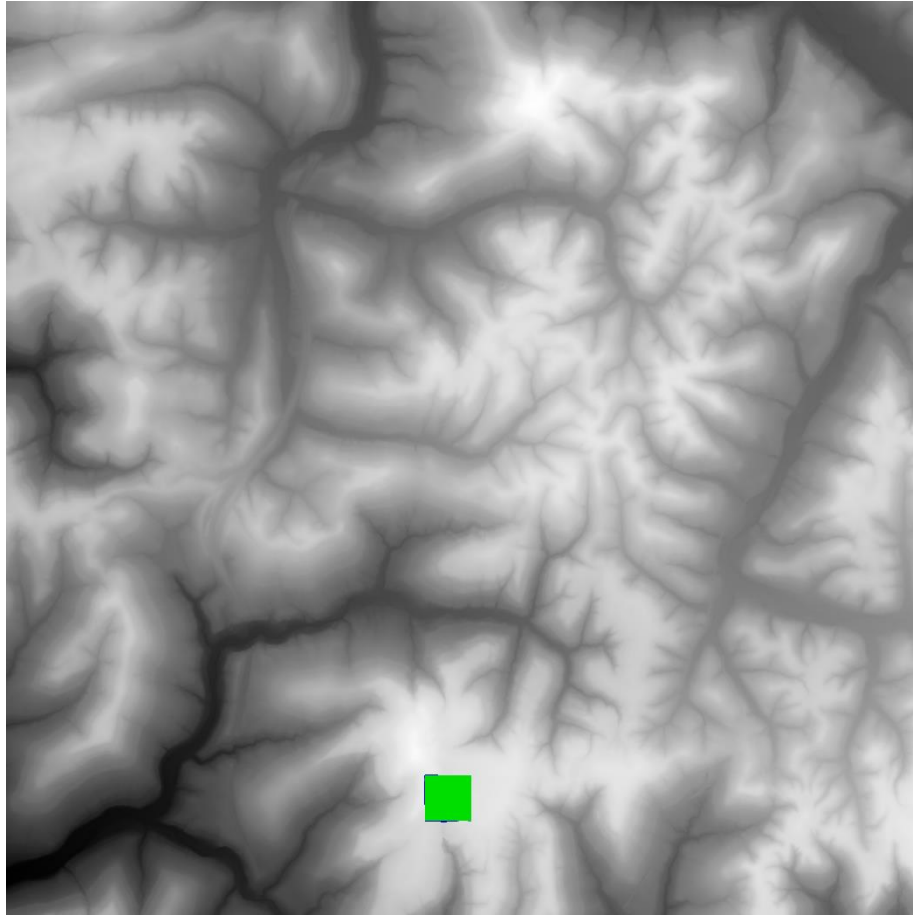
output.png

Zoomed view of output.png

Future Ideas

- Implement a better optimization algorithm
  - Hill climbing
  - Exhaustive search in smaller resolution

- Bugfix level terrain function
  - Check surrounding pixels after changing it
  - Recursive + iterative solution