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Programming for Social Scientists: Geog5995

Assignment 2 – Planning for drunks

This report details the process undertaken for completing assignment 2 of the Geog5995 course. I chose to do my project based upon a suggested project, 'Planning for drunks', of which, the requirements were given as:

- Pull in the data file and find out the pub point and the home points.
- Draw the pub and homes on the screen.
- Model the drunks leaving the pub and reaching their homes, and store how many drunks pass through each point on the map.
- Draw the density of drunks passing through each point on a map.
- Save the density map to a file as text.

Intention

Given that this was a pre-defined project, the desired intention of the software was to design a program to fulfil these given requirements.

Thought process behind software design

Having seen the requirements of the project, I deemed it appropriate to create an agent-based model. This class based, object oriented approach would provide the tools and flexibility required to satisfy the needs of the program. The recognition and inspiration to develop this type of program stemmed from a previous assignment, in which we were required to develop and agent based model that simulated sheep moving in a virtual environment. Due to certain similarities between the two projects, my software design was largely based upon the principles used in this program.

Issues

My greatest issue in development was in identifying the location of each drunken persons 'home'. The 'home' was identified in the given environment as a value of 10, 20, 30…. 250. Given that we know the value of the home, I needed to determine the index of the value. Python provides no standard method to achieve this, and so I created a *for loop* to determine the index value. This function was used to send the drunks home after a given amount of iterations, however from the final animation plot we can see that this calculation was slightly off – as shown in figure 1.

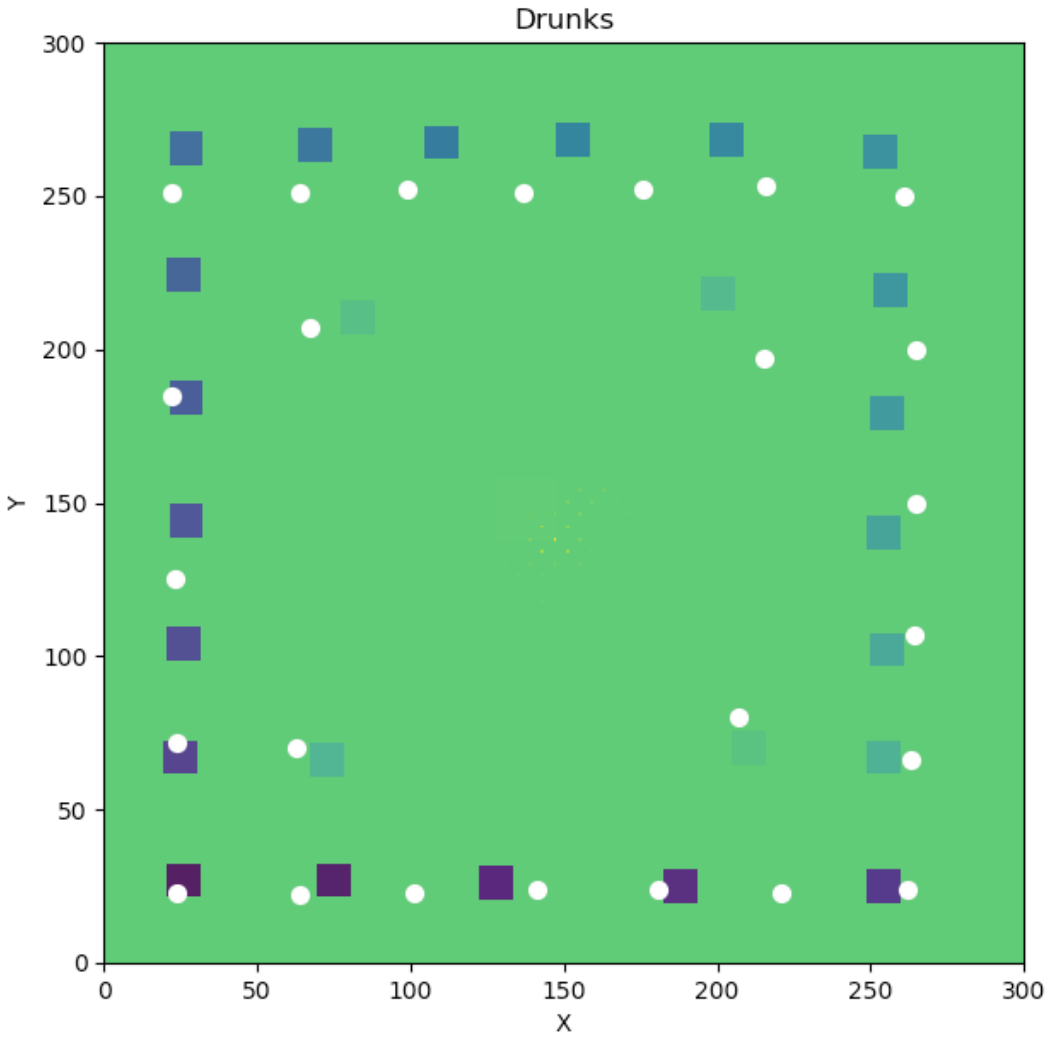

Figure 1: Drunks off desired location

Further work

Initial further work should be concerned with devising a better method to determine the locations of the homes. Given this, it would be possible to work out the angular relationship (using simple Pythagorean maths) between each drunk and their respective home. From this, a vector could be provided to the drunk that would enable them to take a direct route home.

Usage

The model runs from the command-line or terminal. The user should download the files provided in the zip, or download/clone the repository from github, and navigate (in the prompt) to the local directory. Then, the model runs as:

```
python drunks_ani.py [num_of_iterations]
```

where *num_of_iterations* is the user defined amount of iterations before drunks are provided with the location of their home.

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To find the project on my github, which includes all files related to the project and assignment, please go here: https://github.com/harryodell/geog5995