CX 4230 Project 3B: The Plan

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Implementation plan

We plan on implementing the whole framework by 3D and running experiments in 3E. Our main focus is the framework itself since we are implementing it from scratch.

As of now, our main aims are:

- 3C: Implement the base world and initialization process. We can experiment with different grid sizes and different country shapes to see what is more feasible to keep a track of.
- 3D: Implement state changes such as calculation of desirability and how people move across the world. We plan to start coming up with visualizations such as heat maps to show how population densities across the world change. We also start researching on other visualizations.
- 3E: Run the experiments and record the results. If there is time, implement extra features such as war and disease to see how everything changes.

Experiments

We can run a huge number of experiments because of the large number of variables in the model. Here are a few experiments that we can implement:

Add a "tracker" to humans in a certain cell and track their movement across time. This shows us how different people with different preferences move and how the property of the land they were initiated in affects their movement.

For different values of variables such as population growth rate and wealth scores for a particular country, we can check how many net people migrated there. This can be done by running the simulation a certain number of times while keeping all the attribute values for other countries the same.

Since we plan to have different states for each country such as –Prosperous, Recession, War″, we can experiment with different configurations such as always keeping the world in a prosperous state or always in a recession state. How that affects migration patterns and desirability of different countries can be recorded.

Experimenting with the size of the grid and the number of countries is also something we plan to do. How would migration pattern change in a much larger world with much more desirable spots? In a small world, there are less desirable spots and everyone may just want to rush to those spots.

Experiment with diseases: It would be interesting to see how diseases diffuse in a dynamic system. In the SIR model we implemented in 2A, the disease hosts themselves did not move. The people in our model move across.

We can also try modeling the real world by setting various country properties to mimic real world countries (eg USA has a lower population growth rate and it will be easier to move across USA than to move within China). We can also hardcode some census data (easily found on government websites).

We can change border properties for different countries (the border between North and South Korea is almost impermeable while the borders in Europe are effectively freely permeable). So, in a certain country, almost no one can move out or move in. How this would affect that country with respect to other countries can be seen?

Finally, if there is time, we plan to implement some features such as a random disease spread or a sudden World War every once in a few thousand timesteps that has a massive impact on population and desirability.