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Overview:

1 - Purpose:

To examine how socioeconomic inequality affects student acceptance and attendance to colleges. In addition, to examine how students with more wealth attend higher ranked universities. Finally using all the information observed, examine how this might create stratification among colleges.

2 - Entities, state variables, and scales:

Entities: Students and colleges

Characteristics for both entities are rational and utility-maximizing with imperfect information towards each other.

Variables: Different high school achievement, resources for academic preparation, access to information, numbers of school they applied to.

Resolutions: Each tick represents one year.

3 - Process overview and scheduling:

Process: During the application stage, students examine colleges. During the admission stage, colleges rank students and admit them. In the enrollment stage, students choose from their admitted colleges and enroll in one. At the end of a model year, colleges are evaluated based on their new students and potential students examine the colleges for the first time.

Variable updates: application, admission, and enrollment

Time span: 30 years, one tick is one year

Design Concepts:

4 - Design Concepts:

- Emergence - Patterns of student enrollment in colleges.
- Adaptation - Students observe the colleges new standings to choose which to apply to. Colleges are evaluated based on their new students.

- Objectives - Students try to enroll in best colleges. Colleges try to lure students to enroll based on their caliber.
- Learning - Students observe colleges' rankings and qualities. Colleges examine students' abilities and potential.
- Prediction - Students apply to colleges based on if they think they will be admitted to the given college. Colleges admit students to a total number the colleges will be sufficient. Students enroll to colleges they believe will have the highest utility of attending.
- Sensing - The agents and colleges have imperfect knowledge based on imperfect observations. The process of sensing is explicitly modeled.
- Interaction - Students apply and enroll to colleges. Colleges admit students. Students and colleges observe and adapt to each other.
- Stochasticity - The model adds random noise to each student's perception of each college's quality, and to each college's perception of each applicant's observable caliber. Students also have random noise of their own caliber.
- Collectives - Agents are grouped into students or colleges.
- Observation - Data is made into graphs and using Latin Hypercube analysis.

Details:

5 - Initialization:

8000 students and 40 colleges are created, each college has a capacity of 150 students. College quality and student quality are random based on a set range. The initialization varies in each experiment. Most of the initial values are chosen based in data, such as ELS:2002 and College Board. There are model parameters as baseline model.

6 - Input Data:

The model does not use external sources for inputs. Processes that change over time are done in the model such as application stage.

7 - Submodels

- Socioeconomic status(SES): higher SES students are expected to have better caliber, better school activities than low SES students, as a result higher SES students should end in better college destinations.
- Comparison: when students apply to college, they will compare successful past students with themselves, which colleges will compare the results with last year and make decision about admit.
- Different scenarios: different correlations for different percentiles. For example, the correlation between resources and caliber is lower in 90th-10th percentile than that in 90th-50th percentile.
- Parameters: there are different parameters such as the correlation between resources and caliber, the relationship between resources and information quality, and the relationship between resources and the number of applications. These are modeled based on different percentiles.