Predictions – Part 1 (+Bonus of saving and loading system state)

About

The purpose of the system is to enable the definition of a "world" in which a population exists, and to apply to this population a set of "laws" that change in one way or another (statistically) some of the entities in the world.
The system is a generic system that will allow defining the various entities and the laws that apply to them, thus actually forming an infrastructure and fertile ground for the use of as many simulations as required.

Getting Started

Once the program is up, you must load a proper simulation file.
The system will alert you if the file does not meet the standard.
After loading the file, you can run your first simulation!
You can choose values for the environment variables or let the system choose them randomly.
At the end of the simulation run, the reason for its termination will appear and you can view the simulation results.
You can view the results according to the amount of population or histograms on the entity values.
Bonus - you can save the system state to a file and load for reuse.

Main Classes

- Validator - Responsible for verifying the integrity of the simulation file input. If a problem is found in the file, an inductive error will be thrown.
- Engine - Responsible for the relationship between the internal operations and the ui, will return dtos.
- HistoryManager - Holds all the information about the completed simulations. We used this class as a base for the system state, so saving it will allow recovery and return to the last state the user was in.
- Manager - Responsible for managing the ui, the requests come from him to the engine and he routes them. We implemented it as a singleton.
- UiScanner - Allows receiving input from the user according to different types of options.

Notes

- We chose to use DTO to return information to the ui.
- It was important for us to explain to the user where the problem is in an incorrect file, so we kept a variable named source that contained the relevant information according to the location of the error.

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