CSS 458 Project Submission

Team 1796

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Simulating Impact of Epidemic on Population Centers, Resources, and General Populous

### 1. Program Files

All required program files are included in the provided .zip. In addition, the complete set of files can be found on the online repository, see section 2.

Program Files:

Config\_And\_Run.py

Driver.py

Agent.py

Events.py

Locations.py

Parameters.py

Resources.py

Sim\_Tools.py

Testing\_Module.py

Visuals.py

For user operation, only Config\_And\_Run.py and Parameters.py are relevant. See Section 3 for usage instruction.

### 2. Working Repository

The repository for the project can be found here:

https://github.com/IProxyPI/PlagueSim

### 3. User Manual

There are two relevant files to running the simulation:

Config\_And\_Run.py - Execution config and driver

Parameters.py - World config

**Config\_And\_Run.py:**

Config\_And\_Run.py serves as the driver program with the following utility:

* Configure the simulation parameters
  + Number of executions
  + World presets
  + Simulation time
  + World response
  + Live outputs
  + Analysis
* Creates the driver objects and executes the program

Program execution is done by running Config\_And\_Run.py.

The parameters of the simulation are configured in their respective categories, with the following options:

*simulation\_time - Months*

*print\_interval - Time steps between graph/progress bar prints. -1 to disable*

*world\_factor - Factor to multiply city size by*

*number\_of\_simulations - Number of times the simulation is run, results are averaged*

*world\_preset - Preset for which city is generated and used in the simulation.*

*Available world presets:*

* *"Mini city" ~= Population 1601 \* world\_Factor*
* *"Large city" ~= Population 6568 \* world\_Factor*
* *"Small town" ~= Population 866 \* world\_Factor*
* *"Downtown" ~= Population 4942 \* world\_Factor*

*analysis\_checklist = [ Display real-time graph,*

*Real-time graph cumulative or not*

*Track an agent ]*

*respose\_effects = [ Enforce masks,*

*Enforce vaccine,*

*Enforce isolation ]*

**Parameters.py:**

Parameters.py functions as the config files for the simulation parameters that are less likely to be configured on a run-by-run basis

### 4. Analysis Report

Through the use of the model, we can gather a large amount of data

### 5. Project Contributions

Commit contributions:

Individual Contributions:

Gabriel:

* Model plan
* Model design
* Model implementation
* Model testing/tuning
* Presentation
* Documents