CSE443 Design Patterns
Final project Report

EPIDEMIC SIMULATOR

Instructor: Doç. Dr. Erchan Aptoula

Student: Mohammad Ashraf Yawar 161044123

Design Decision Explanations

- The scenario goes like this:

- When we execute the jar file, we will be asked whether to enter 1 for entering individuals one by one with our hand or 2 to enter the count of individulas in society and then submit.

- Then 2 windows will pop up one for controlling simulation (pause, resume, start, plot graph, exit) and the other one to visualize simulation in each second.
- Whenever we click to start button , in the background threads will start.

- BackEndThread will continuously control individual collisions in society and if any then update.

- FindDeadIndivisualThread will continuously control individual list if any dead, if any then delete it from the list so that it will not be shown in the next refresh of GUIThread.

- GUIThread will continuously refersh to the simulation and statistics of the dead, infected, hospitalized, and healthy individuals.

- HospitalThread will continuously control if any current patient under treatment is cured, if any then return them to society, and also control the society if any infected and if there are any available ventilators then hospitalize them.
- I added the Jfreechart-1.5.2.jar file into the project so that I can plot graphs using that library.

- When we click plot graphs from the statistics frame it will plot graphs of infected and dead individuals concerning each second with varying R Z and others.

- Since I had one individual class to represent individuals in society or to say canvas, I used it as a normal class, I, of course, have thought of using the Bridge design pattern here as you have mentioned in the class, but it was not appropriate to use so I didn't.
- For the hospital, I used producer and consumer paradigm using observer design pattern, it does not fully pit this design pattern it was what I came up with , I thouth of the hospital as producer and individuals as consumers.

- I used a mediator design pattern as a controller between GUI, threads, and hospitals.

- All the aggregated classes will request a mediator class and it will act accordingly.
- I proved SS, UML classes, Javadoc, and executable jar file in the otherstuff folder.
- I separated the class into packages of com. company, gui, and threads so that we can navigate easily and also maintain the rules and convention.
- I have provided a youtube link which is private and only you can access it.
- I will make is public after finals.
- Link: https://youtu.be/ysZ_WnyhATM

- How do these outcomes relate to the population P? Linearly? Exponentially? Something else? To answer this: it depends on the amount of population, differing values of R, Z and according to a few test and graphs that it plots for dead and infected individuals, the graph is not really linearly of exponentially, it depends actually, sometimes it is like a zigzag graph and sometimes it is like exponentially and sometimes others.

- The red-colored 5x5 pixels dots mean they are infected. The black-colored 5x5 pixels dots mean they are healthy and the magenta-colored 5x5 pixels dots mean that they have been infected and their timer is above or equal to

25 seconds which means that they are eligible to be hospitalized if there are empty available ventilators in the hospital.

- I changed the icon for the executable .exe file to make it more realistic. It will only work on windows but also we can run it on linux using wine. but .jar file will work on both.
- Path for executable .jar file is: “EpidemicSimulator\out\artifacts\Epidemic_Simulator_jar”
- And thanks sir for the all effort on this subject ☺