NORTHEASTERN UNIVERSITY

COLLEGE OF ENGINEERING

INFO 6205 – Program Structures and Algorithms

Document Control

Document Details	
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Title	Pandemic Simulator

Version and Distribution History			
Version #	Date	Description of Change	Author
1.0	27/03/2021	Initial Draft	Aakash Shukla
1.1	19/04/2021	Updated the technical stack	Aakash Shukla
	Click here to enter a date.		

Document Approvals

Name	Title	Signature	Date
Prof. Robin Hillyard	Associate Professor		

Contents

Solution Overview

This solution simulates the spread of SARS – COVID-2, the pathogen behind COVID-19 and provides a medium to study the growth and spread of virus among people.

Summary

The main purpose of this solution is to provide an interface to study the growth of SARS – COVID -2 and the effect that various remedial measures like contact tracing, vaccination etc. have on its growth rate.

Requirements

The table below lists the main functional and non-functional requirements towards the solution design.

Req No.	Reference Areas	Description
REQ001	Functional	Covid growth data
REQ002	Functional	R – Factor and K – Factor of growth
REQ003	Functional	Remedial Actions
REQ004	Functional	Java GUI to simulate growth
REQ005	Functional	Unit Tests
REQ006	Non – Functional	Report – Conclusions
REQ007	Functional	Comparison with SARS outbreak

Table 1: Requirements

System Context

The below diagram shows the system context diagram for the designed solution.

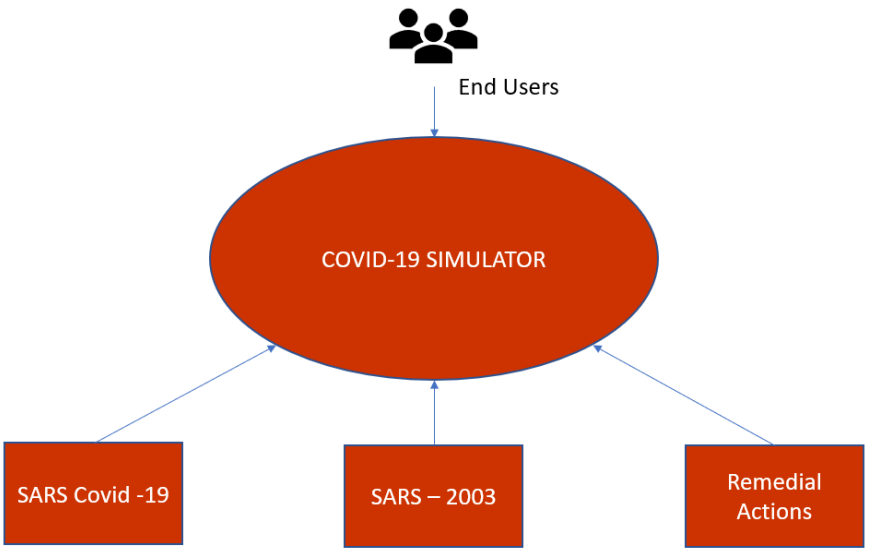


Figure 1: System Context

Architecture Overview

The below diagram provides an architectural overview of the solution.

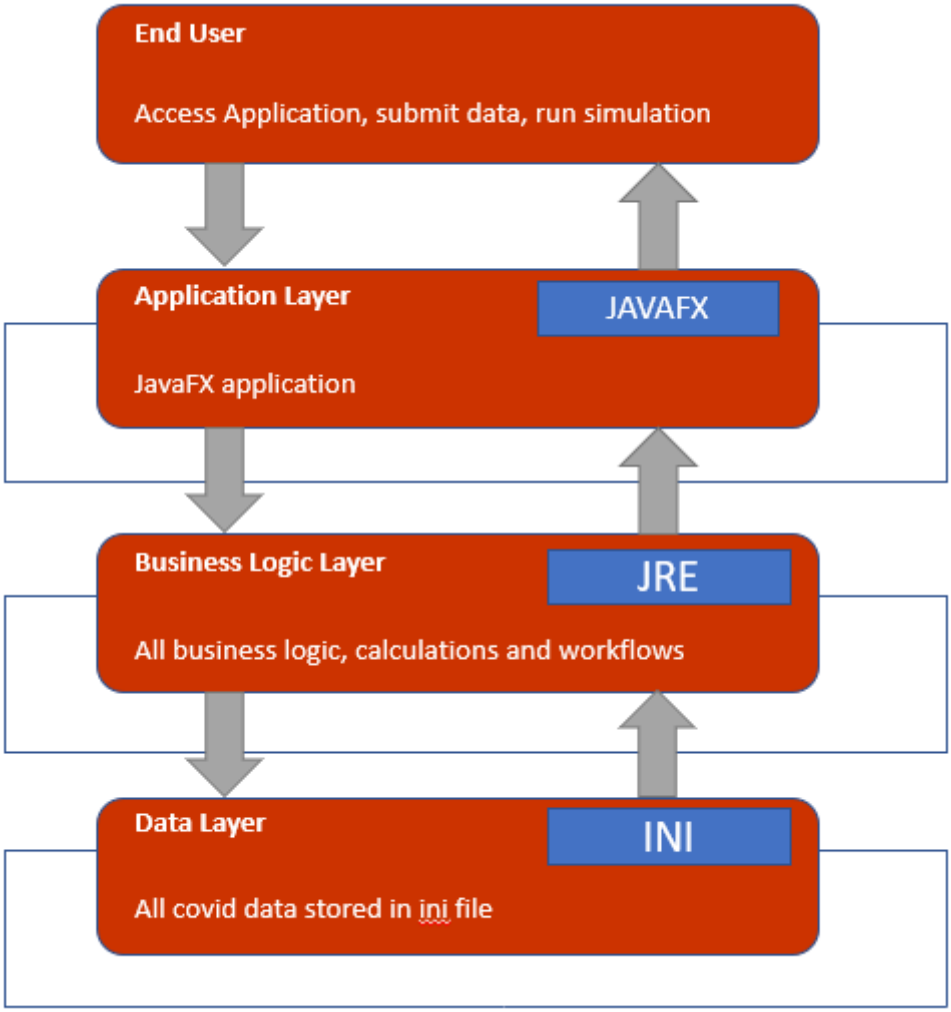


Figure 2: Architecture Overview

Infrastructure Design

This chapter describes the infrastructure including hardware and software that the system must operate in and interact with.

Infrastructure Constraints

There are no infrastructural constraints linked with the solution.

Hosting Infrastructure

The application can run stand alone and does not require any separate hosting infrastructure.

End User Devices

All end user devices are supported provided they have Java runtime environment and JavaFX installed on their system.

Security and Privacy

No security constraints associated with the application as it does not interact with web and does not share any data over internet.

Communication Rules

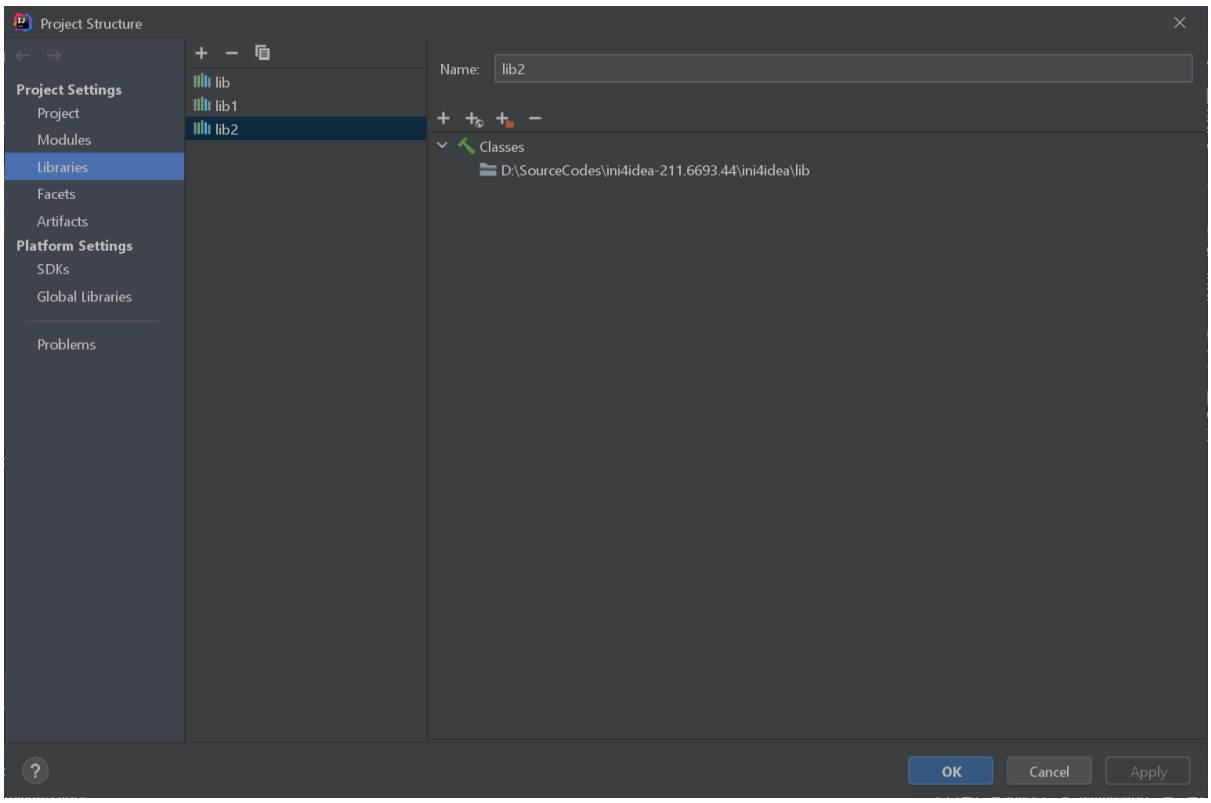
Not applicable as all the simulation data is stored within the application.

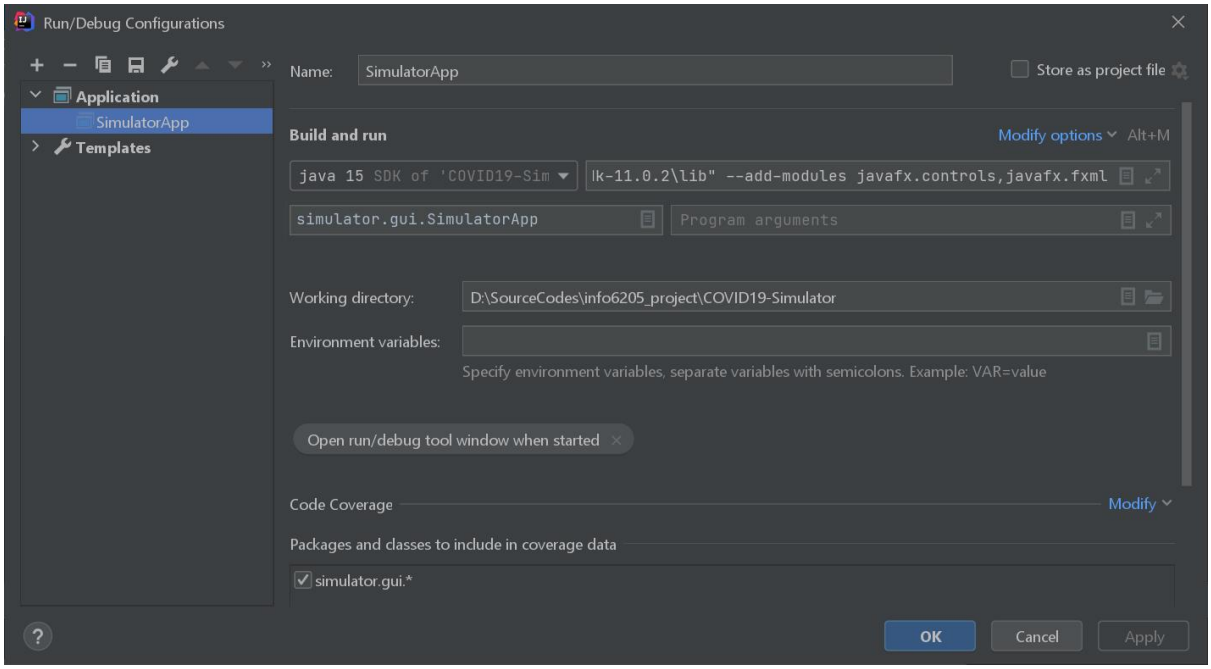
Application Design

Application Constraints and Deviations

Application requires a valid instance of JavaFX and JRE installed in user's system to work.

To install JavaFx, add the path to JavaFx lib folder in the IDE and add the VM options as well.





In the add VM options add the path as follows,

--module-path "Path to JavaFx \Java\javafx-sdk-11.0.2\lib" --add-modules javafx.controls,javafx.fxml

Integrations

Application does not integrate with any other system.

Bill of Materials

Licenses

No licensing involved as it is a custom-built system.

Appendix – A – References

Titles	Description/Link
Java installation	https://java.com/en/download/help/download_options.html
JavaFX installation	https://openjfx.io/openjfx-docs/

Appendix – B – Glossary

Item	Definition