COVID-19 Test Recommendation

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Introduction

Description

The project is to develop an application to determine whether an individual is recommended to seek out a clinic to be tested for COVID-19. Individuals using this app would be determined via answering if they show any symptoms such as a dry cough, fever, fatigue, to shortness of breath. Areas that the individuals has been in the past will also be checked, if they fall within the tier 1-3 sites. These locations would be constantly updated to provide relevant information to the user and better safety for the community as a whole using this application.

Along with providing recommendations, the application would be updating databases to keep track of individuals who have used this service, and further detail for individuals who have become a positive case. Which in turn update any locations that aren't held inside these databases. Patients who have recovered or have not, will also be record via the application.

Challenges

Database

The majority of development would be put into the sorting and searching function of the application when wanting to update an already existing record of the patient. Writing a formal recorded is straightforward enough, but finding a unique ID of the patient and update their status that would be pending for updates from their test result will be the main challenge of our development.

Arrays/Vectors

Once creating databases, and deciding what data will be used, arrays or vectors would be created and used as they provide us with the flexibility to store and compare data via the databases. Arrays must have set quantiles, where vectors are dynamic, they are useful for the use of data brackets like Age, ID, Address, etc. that would be found within the patient's records.

Teamwork

Delegation of work and communication issues may arise during development of the program as a team. In our experience, while working on projects requiring some form of programming was delegated to a single member rather than the team. Tackling this will be of one of two ways, first method would be we assign different functions that each member is assigned to create and test will a template display that is already created. Method two is we create individual classes and call them via the header in our main .cpp file using our standard template design as before.

Working remote

Because of the outbreak of the pandemic and recent events, not just projects, but everything has been put on hold or online. Preferably, in person discusses between members cannot be achieved, therefore utilising web based services and application like Discord, Zoom, Facebook GitHub, Microsoft Team, etc. will make communication and the sharing of data between members will be eased.

Code Implementation of structure

A clear fundamental structure provides clarity and flow of the code and its algorithms. This in turn makes for ease of understandable between members with their communication. Part of the structure hierarchy is for example functions, which will informs us, what's the process, where are area of issue, and troubleshooting. Each function will vary in its functionally and may take sometime to complete and the combined effort of each member. From this, we are better prepared to allocate resources to the appropriate task.

Projects Intentions

Goals

The aim of the project is to create an application that takes data created from the user, that is then stored in various databases with an assortment of data sets which can be accessed by the same application again. Further, these databases could be accessed by other applications for different use. These Databases need to be readable

Objectives

Objectives will be split between group members, with each having tasks that they will mainly manage over the course of development.

Mathew Zobec:

- Input of Data
    - Input that will be allocated to an appropriate variable, and will be passed to a function.
- Menu Overview and Design
    - Creation of the menu that will display all the required information for the user to see to decide and chose an operation, then loop to the beginning for more input and decisions.
- Managing time frames
    - Making sure we hit the appropriate milestones at the right time so we won’t come to delays or end up having overwork our self in the last days of the project.

Alex Zmasser:

- Maintenance of the Databases
    - Maintaining the relative of information, creating the format, and readability of all database's output files.
- Output of data
    - Retrieving information from selected databases to display and updated COVID-19 locations along with the status of positive patients.
- Designing of program structure
    - Designing the blueprints of the structure of the overall application. Which libraries will be utilised, what information should be passed into a function and what information should return.

Desirables

Outcomes

To provide a comprehensive database that records, maintains, and updated patients that have addressed concern with their symptoms or have visited locations, for the application's use of providing a recommendation of a COVID-19 test. Affected individual via hotspots/symptoms, can be accessed and assessed via these databases by user and appropriate bodies such as, government, hospitals, police, contact tracers, etc.

Benefits

Two main benefit that come from this project is one. To create an application that provides users with a recommendation for tests, limiting their exposure from infecting other individuals. Secondly and more importantly, this project is to teach us how to work in teams, as working alone would be uncommon in our profession. This will break up our tasks required, making the process more enjoyable, easy, and less stressful in a team atmosphere, providing a knock on affect making our code more readable with its structure. Along with seeing what kind of programs we might have to create in a working environment, seeing the scope of this kind of creative process, giving us a sense of what's expected.

Success Metrics

Matrix

	Successful Data Retrieval	Unuccessful Data Retrieval
Successful Data Storage	• The ability to successfully write to all databases. • The ability to successfully read all databases. • All functionallity avaliable to the user. • No errors, cashes, or inconsistencies. • No duplications within databases. 	• The ability to successfully write to database(s). • Cannot read one or all database(s). • Incomplete functionallity to the user. • Inconsistencies. • Higher priority given to problem solve issue. • Review class that creates object to seek and sort for each line. 
Unsuccessful Data Storage	• The ability to successfully read database(s). • Cannot write to one or all database(s). • Incomplete functionallity to the user. • Inconsistencies. • Higher priority given to problem solve issue. • Duplications may be present. • Review class that creates object that sends output to files. 	• Cannot read nor write to all databases. • No functionallity to the user. • No consistency. • Highest priority given to problem solve issues. • Review classes that creates objects to seek and sort for each line and output to files. 

- The main aspects for success for us has been determined to be utilising both the retrieval and storage of data.

Project Planning

Scope

Design and create an application written in c++ that will recommend users to be tested for COVID-19, provide a record of their login and update on their status. These logs are to be withheld within three databases are to be used and updated, with their own unique field held within each.

Databases are to be:

- Patient Database
    - ID
    - Name
    - Date of Birth
    - Address
    - Age
    - Locations visited
    - Date
    - Overseas Travel
    - COVID-19 Test
    - Status
- Symptom Database
    - Low Risk Symptoms
    - Medium Risk Symptoms
    - High Risk Symptoms
- Exposure Database
    - Location Name

Users upon opening the application are to be presented with:

- Press 1 — Enter Details for COVID-19 Test Recommendation.
    - Via pressing the integer ‘1’ the user will be prompt to enter:
        - ID **Unique**
        - First Name
        - Family Name
        - Date of Birth
        - Age
        - Address
        - Recent Overseas Travel
        - Symptoms
        - Visited any Tier 1-3 Exposure Sites

- Press 2 — Submit Test Results.
    - Via pressing the integer ‘2’ the user will be prompt to enter:
        - ID **Unique**
        - Result of Test
    - The user's status will be updated within the patient database with a negative or positive. In the event of positive results, information such as new exposure sites will be updated within the High-Risk-Location database.

- Press 3 — Display Tier Exposure Sites.
    - Via pressing the integer ‘3’ the user will be presented with the most up-to-date record of exposure sites.

- Press 4 — Update Patient Details.
    - Via pressing the integer ‘4’ the user will be prompt to enter:
        - An update on status:
            - Cured **requirement**
            - Dead **requirement** (Cured)*wink* //remove after
            - Stable
            - ICU
- Press 5 — Display Positive Patient Details
    - Via pressing the integer ‘5’ the user will be presented with the most up-to-date record of COVID-19 positive patients:
        - ID **Unique**
        - First Name
        - Family Name
        - Date of Birth
        - Age
        - Address
        - Any Overseas Travel
        - Status
        - Any Exposure Sites Visited

- Press 6 — Exit
    - Via pressing the integer ‘6’ the user will be presented with a display message “Goodbye” before closing.

Exclusions

Any illegal input from the user is not to be accepted and recorded, followed via an error handling message such as “Error 001 ~ Doesn’t Accept Numbers”, for example.

In the event of empty data sets for the patient(s) that don’t require dynamic process, these are not to remain empty but to be filled with placeholder statements such as “Database is empty”, “Pending result”, etc. In the data sets that require processes, users will be prompt with error handle such as “Unable to recommend Test” for example.

Diagrams

Database Table

Patient-Detail Table

Field Name	Data Type	Description
Patient ID	Integer	
Name	Var Char	Name of the Patient
Date of Birth	Integer	
Address	Var Char	
Visited Location	Var Char	
Date/Timing	DateTime	
Last overseas Travel	String	Yes/No
Covid Test	String	Positive/Negative
Status	String	Alive/Dead

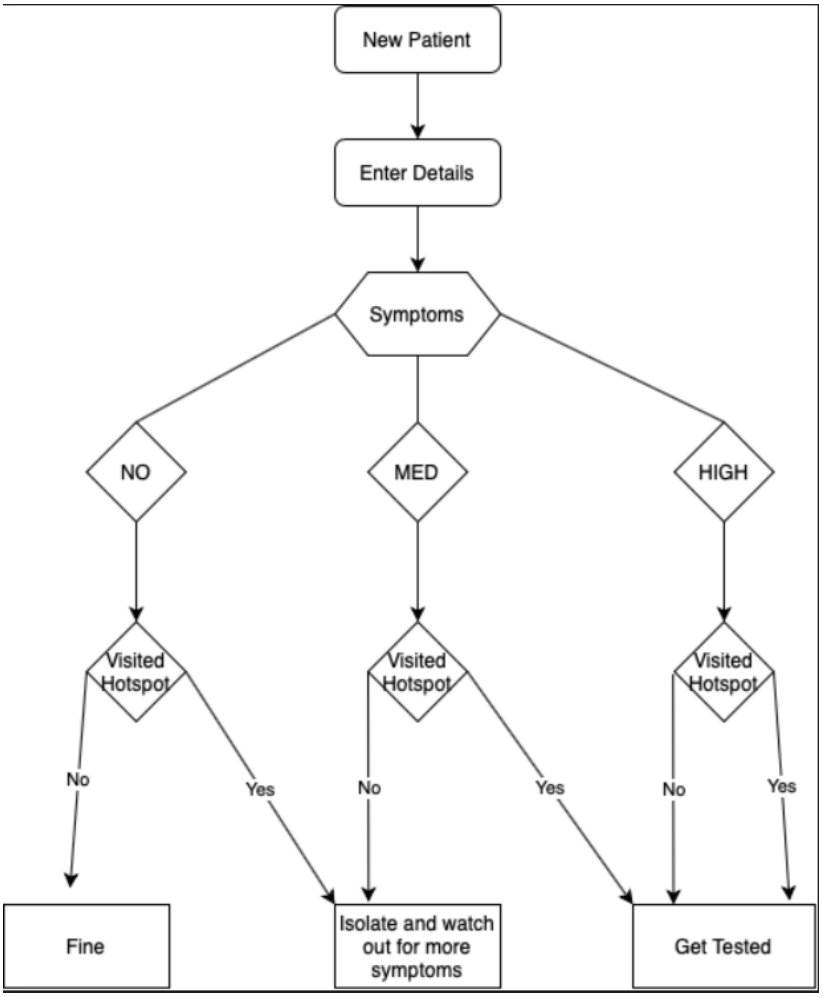
Symptom Table

Field Name	Data Type	Description
Low Risk	Var Char	Fever Dry cough
Medium Risk	Var Char	
High Risk	Var Char	

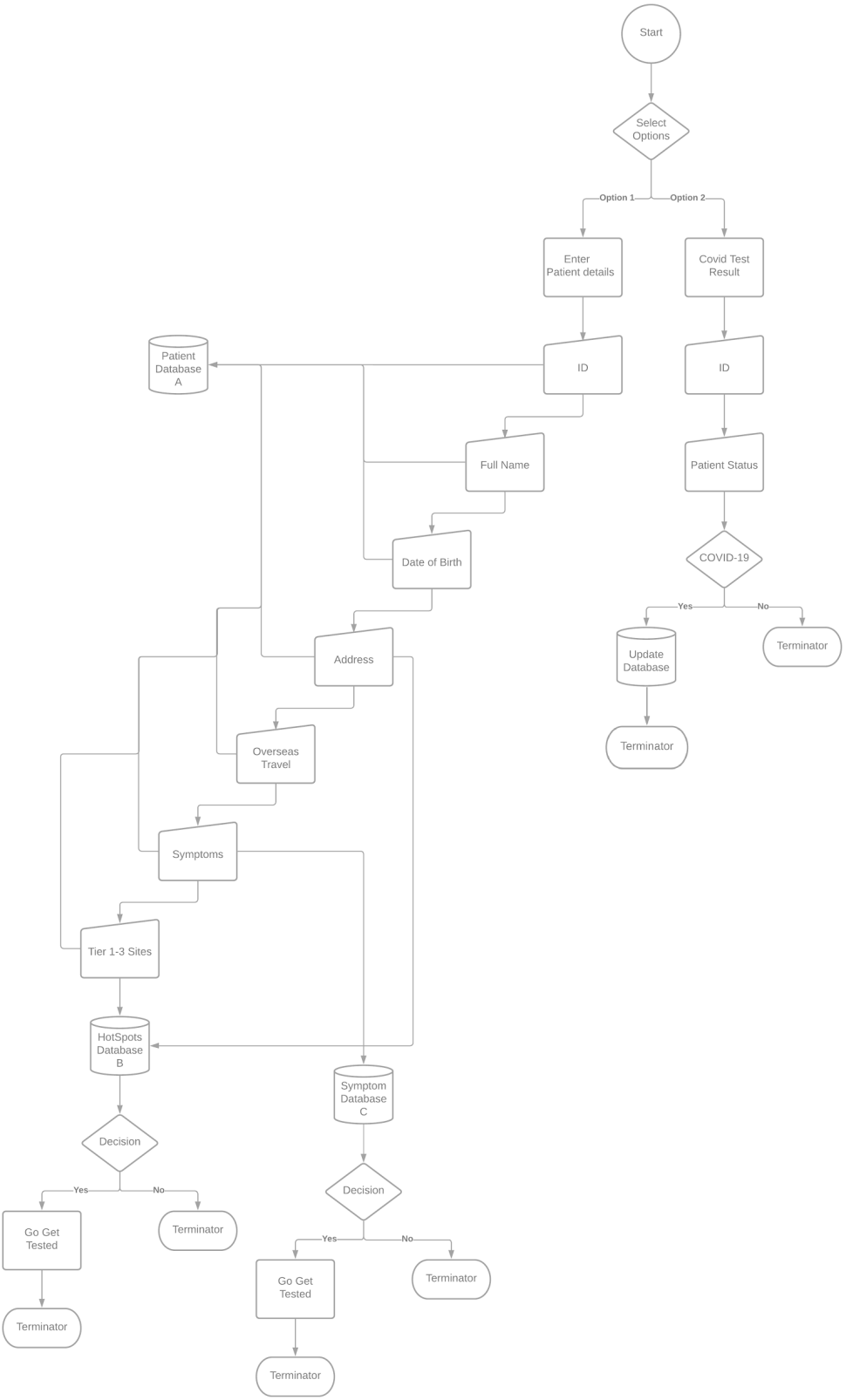
High Risk COVID Location

Field Name	Data Type	Description
id	Var Char	Auburn Train Station
id	Var Char	Royal Hotel

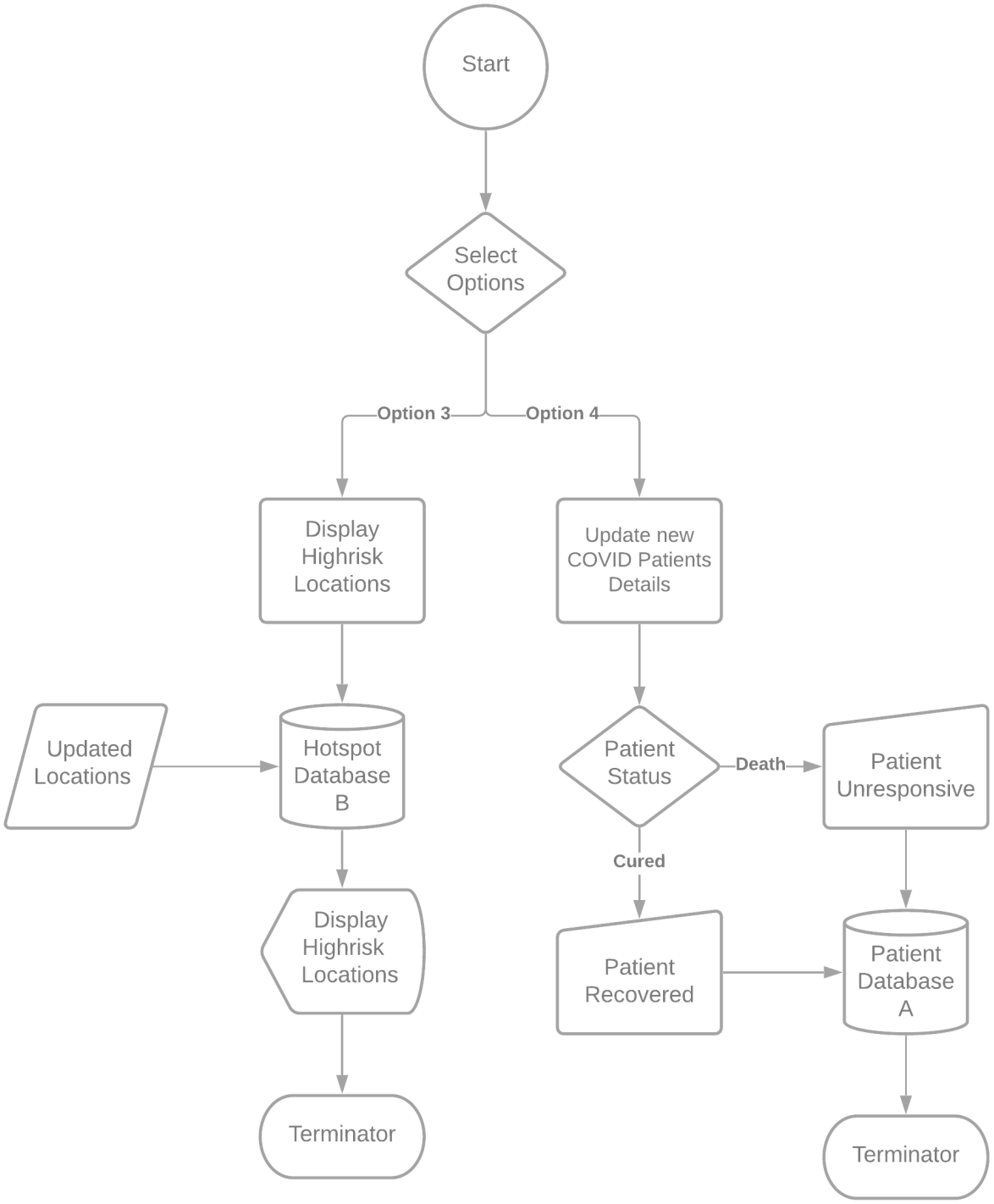
Recommendations Flow chart



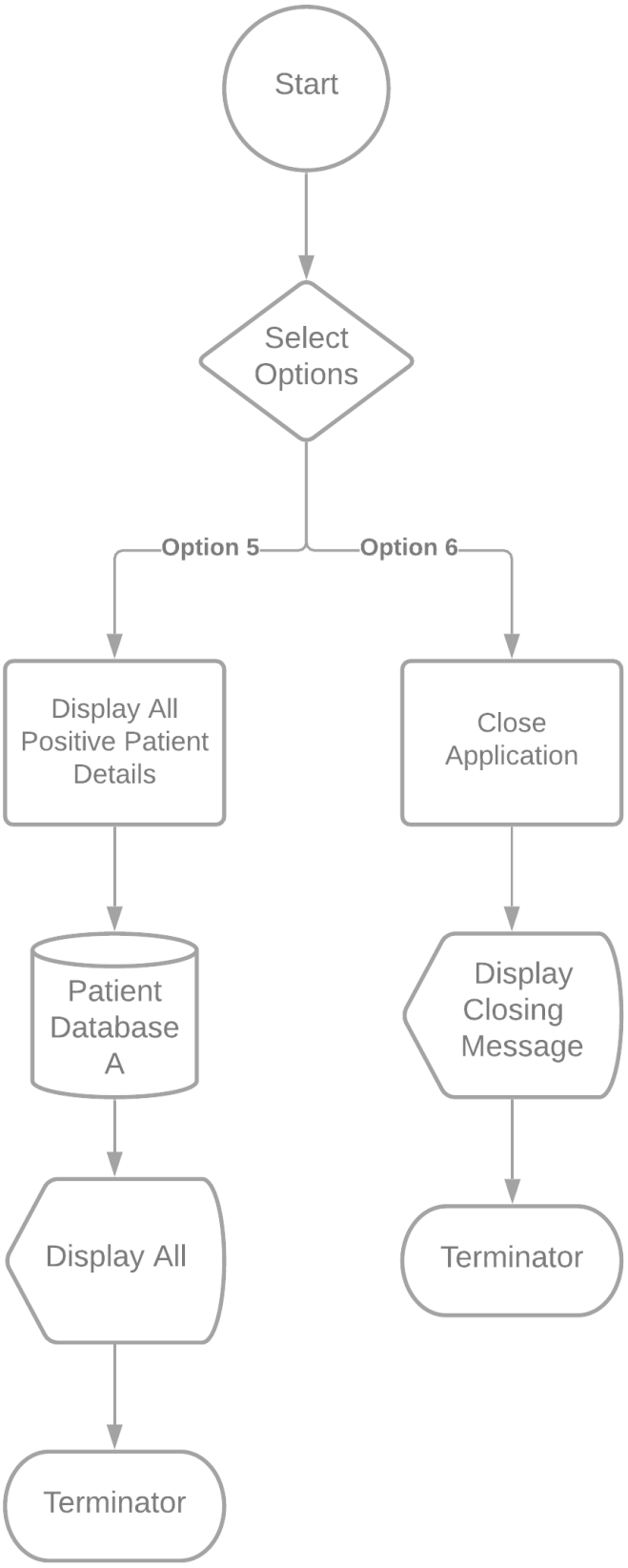
Flow Chart 1-2



Flow Chart 3-4



Flow Chart 5-6



Project Deliverables

Deliverables

An application for citizens of Victoria, to provide a service of recommendation to users to get a COVID-19 test. This is to deliver the user:

- Enter detail for COVID-19 recommendation
- Update of status of test
- Display of all exposure sites
- Update to patient's status
- Display positive patients logs
- Exit message

The application is to provide with three databases to withheld unique data sets that are to provide the majority of functionality to the user's experiences, these to be:

- Patients Database (A)
    - Record providing information of each patient's status.
- Hotspot Database (B)
    - Record of all location positive case patients have visited recently, well infectious.
- Symptom Database (C)
    - List of common symptoms to serious complication related to COVID-19.

Miscellaneous

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Project Team: Matthew Zobec (102567581), Alex Zmasser (102293556)
Year: 2021

Quality Assurance Review:

Reviewed by	Date

Release and Revision Record:

Revision Date	Release/Revision Description	Version

File name:

Last Save Date:

Project Principal:

Contributing Authors: