NAME: KATEY GODWIN KATEY-OBAA
MATRIC NO: 18/ENG06/035
DEPT: MECHATRONICS
COURSE: STRUCTURED PROGRAMMING (ENG224)

Question
Covid-19 has causes a serious pandemic across the world, with serious impacts been felt in all areas of humanities. As a young engineer working with a multinational health company, you are saddle with a huge responsibility of designing
Web- based application that can detect, display, rate(degree of infection), store,
Transmit data obtained wirelessly and access the data via the web together with
Other features which the board of director sallow you to come up with.
1. Design the application following the software development cycle.
2. Critically discuss the hardware and software features.
3. Support your answer with a flow chart and an algorithm.
4. Draw the Top-down or Bottom-up design approach of the application.

DESIGNING A WEB-BASED APPLICATION APPLICABLE FOR TESTING OF THE COVID-19 IN HUMANS

1. PROGRAM DEVELOPMENT CYCLE

CONCEPTUALIZATION: Due to the current pandemic that hit the world, the world has been greatly affected economically, financially and health wise. Actions have been taken by various health bodies to curb the spread of the virus. The purpose of this program is to create a more effective way to test the Virus and detect it before it is given the chance to be spread.

SPECIFICATION: The application will require a User friendly interface so that even the layman would
Be able to maneuver his way and provide for optimum user experience. Frontend development using languages like HTML, CSS and Java Script would be used to ensure this.
The back end development using languages like Java, PHP or Python will ensure adequate communication between the database and the application. So that the Application's responsiveness and speed is at optimum levels at all times

DESIGN: This stage involves the development of the algorithm and flow chart in order to understand the program flow. The Algorithm, flowchart, modular design would be elaborated later.

IMPLEMENTATION: The program would be implemented using the following programs

1. Java & Java FX : For the structure and program construct
2. Firebase SQL: For the programs database
3. Javascript & CSS: For the programs web and graphical display
4. Html : For the program's web construct and design.

TESTING AND DEBUGGING: After the program is built, it would be run and tested for any logical errors and debugged of any if found. The program is tested across a variety of cases and made sure it goes along with SSL privacy terms and WHO health's specifications. Although the application is tested at every stage of its development, after the front end and back end development. The final integrated testing is carried out over the web to fix final bugs before it is deployed to the market to ensure its smooth running and user friendly interface

.

RELEASE & UPDATE: The program would be released and used to test patients all over the globe and if any recent development occurs, we would update the application to fit the new specifications.

2. HARDWARE AND SOFTWARE FEATURES

HARDWARE FEATURES:

The hard ware features necessary is the virus testing kit which is based on either:

1. Real time reverse transcription- polymerase chain reaction (rRT-PCR)
2. Isothermal and nucleic acid amplification

The techniques mentioned above involves taking the of air samples from the lungs to test for the presence of the virus.

Chest Scan: The chest scan is used to show the degree of infection once the presence of the virus has been predetermined be the above features, thus to the level of medication needed for the patient.

SERVER: A server would be needed to store the data collected from the various test for future reference and also research and development purposes.

Fibre Optics: To ensure the speedy transfer of date from the hardware to the server and through development Laboratories.

SOFTWARE FEATURES:

DETECTION: The RNA of the COVID-19 virus would be stored on the program and used as a reference point. Once a sample comes in that matches the RNA stored, program would show detected.

DEGREE OF INFECTION: Once the virus has been the detected, the patient would be taken for a

chest scan to know the rate of infection, if the scan falls in any of the four scan photos representing the various stages already stored on the program. The it would select the stage in reference.

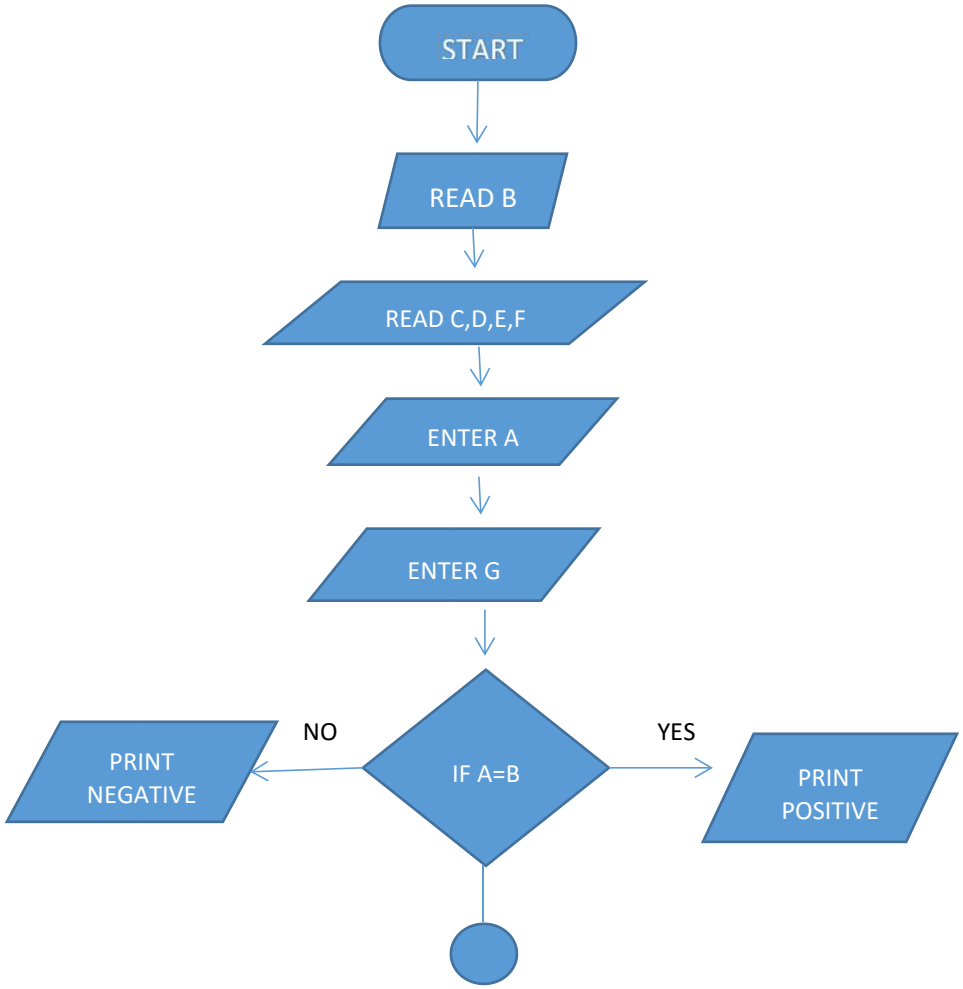
DISPLAY: The program would the send the date to the LED interface built with Touch screen clarification where the operator can input some specifications before sending it to the server.

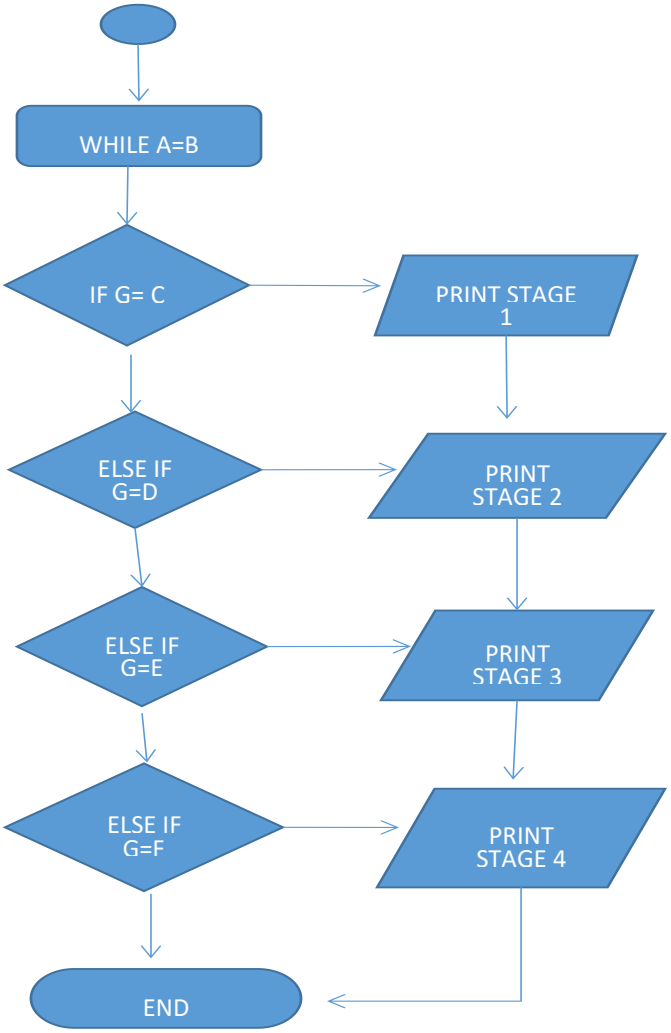
3. ALGORITHM & FLOW CHART

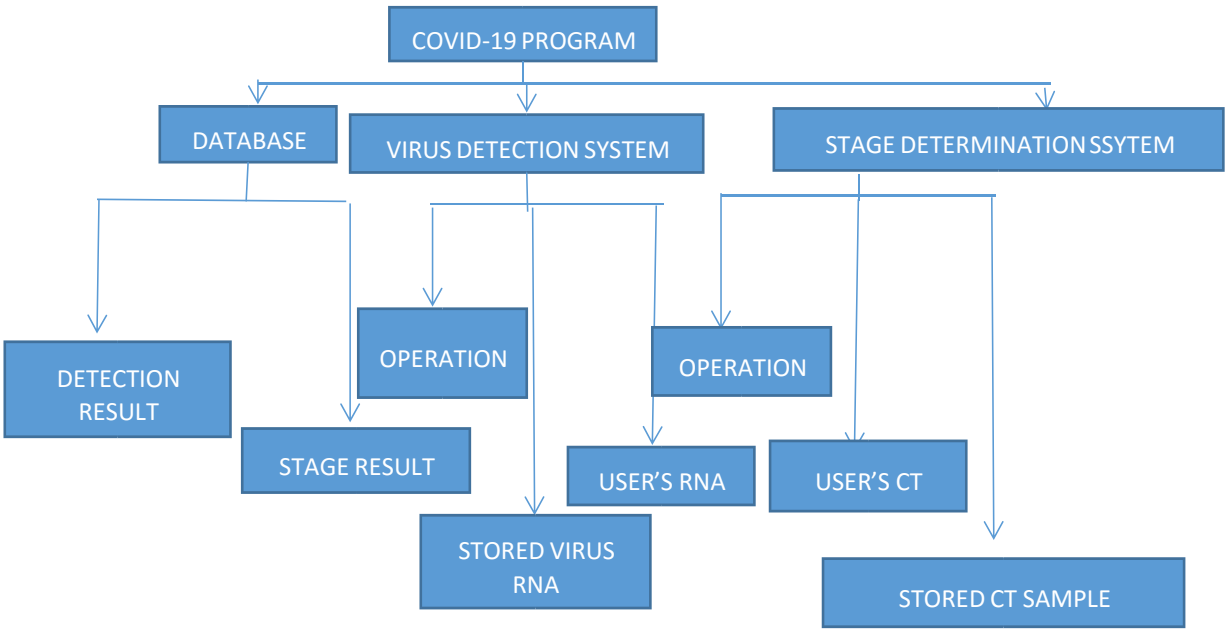
ALGORITHM:

Start
Read A= User's air Sample // Stored sample
Read G= User's CT photo //Patients CT scan
Read C,D,E,F //Already stored CT scan foe determining stages
Read B= Stored RNA sample of virus //Stored RNA sample of virus
If A=B
Print positive
Else
Print Negative
While A=B
If G=C
Print stage 1
Else if G= D
Print Stage 2
Else if G=E
Print stage 3
Else if G=F
Print stage 4
End

FLOW CHART:







4. MODULAR DESIGN