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MATRIC NUMBER: 18/ENG08/007

DEPARTMENT: BIOMEDICAL ENGINEERING

Course Title: Structured Computer Programming

Course Code: ENG 224

ASSIGNMENT

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 multi-national health company, you are saddle with a huge responsibility of designing web-based application that can detect, display, rate (degree of infection), and store, transmit data obtained wirelessly and access the data via the web together with other features which the board of directors allow you to come up with.

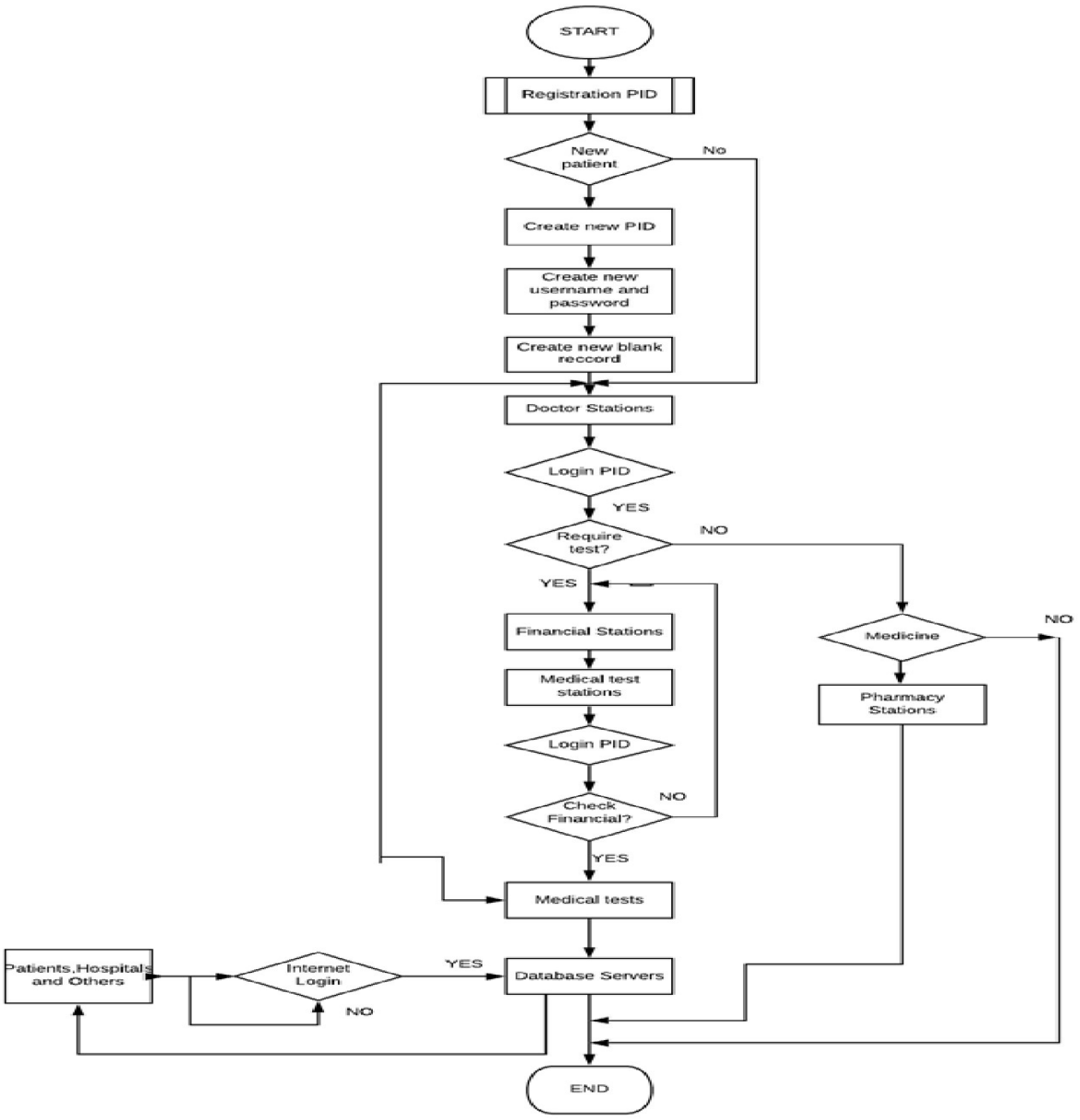
A. Design the application following the software development cycle.
B. Critically discuss the hardware and software features.
C. Support your answer with a flowchart and an algorithm.
D. Draw the Top-down or Bottom-up design approach of the application.

SOLUTION

A) Design the application following the software development cycle

1. Conceptualization: The plan or concept is to design a web based application that can detect, display, rate (degree of infection), store, transmit data obtained wirelessly and access the data via the web. The need of this application is to help detect the pandemic (Covid-19) easier and reduce the spread of the pandemic
2. Specification:
    i. Software
        i. Patient track software
        ii. Chatbot helper software
        iii. GUI
    ii. Hardware
        i. EHR guidance tool/system
        ii. Rapid-response Covid-19 test kits
        iii. Digital Epidemiology

3.Design:



4. Implementation: The software is implemented using both higher level language like (Python, PHP, Visual Basic and C programming) and low level language like (assembly and machine code)
5. Testing and Debugging: The device didn't run as it should have due to logical or syntax error, a test was therefore carried out to identify these errors. And then the process of debugging took place (process of removing errors/bugs). After this took place application ran smoothly
6. Release and Update: The application is manufactured, sold and distributed, and a surveillance occurs for feedbacks. The application is updated every 3 months due to any change in Habit or Health issues

B) Critically discuss the hardware and software features.

1. Software

Patient track software: This tool removes the need for paper records and enables hospitals to provide real time and complete information to other health departments on the number of people screened, tested positive and who have died.

Chatbot helper software: This software is used to remind patients about an upcoming appointment or a regular checkup, to collect feedback, to check up on their health condition.

GUI: With the use of a GUI, patients or medical professionals have easy access to a whole range of data stored by the device, via a simple interaction with the screen. Therefore with a paperless system and proper data security protocols in place, sensitive patient information is safer.

2. Hardware

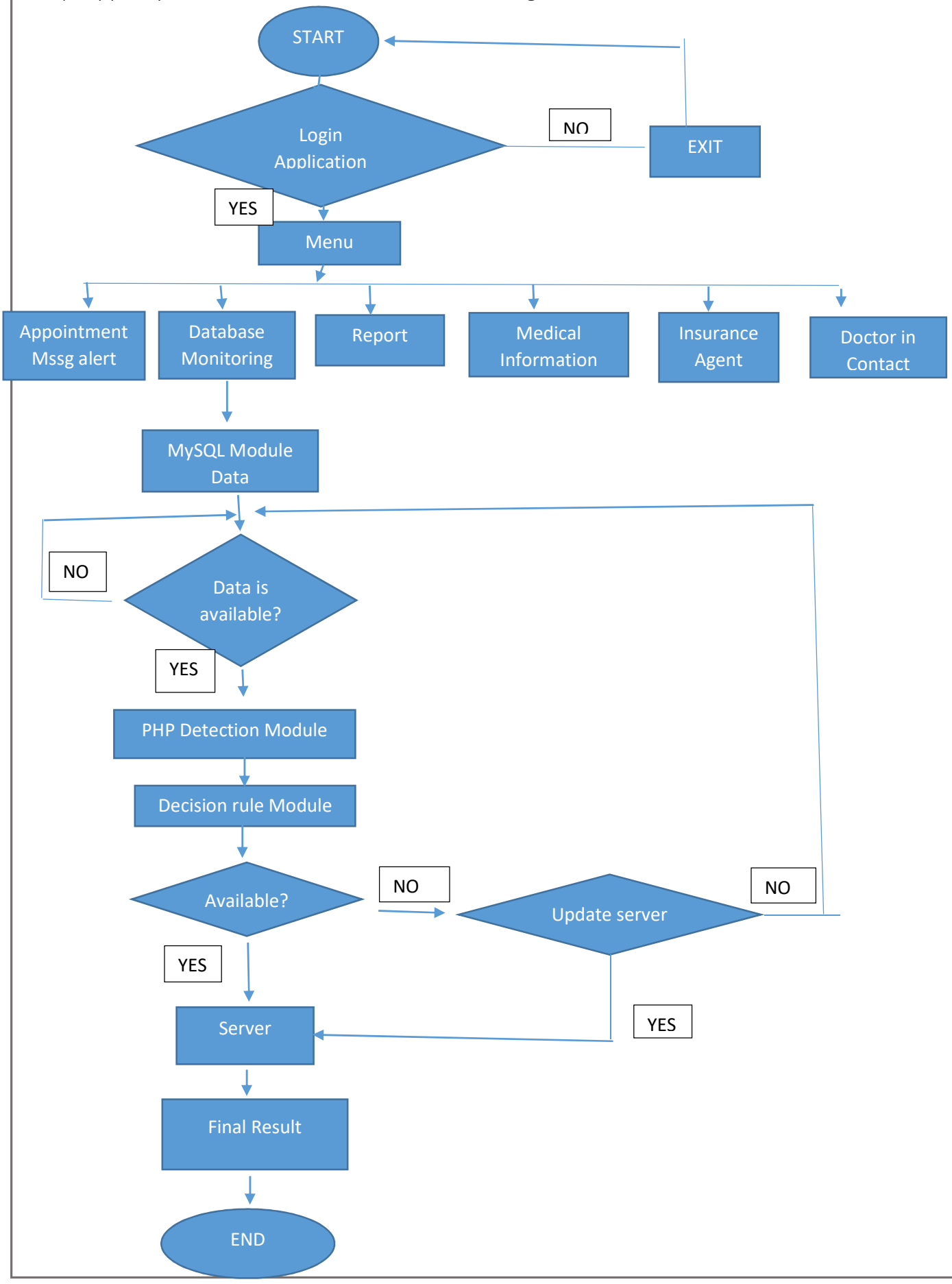
EHR guidance tool/system: This can be used to integrate real time electronic health care information from medical devices and multiple health care providers involved in the care of patients.

Rapid-response Covid-19 test kits: These test kits can detect a corona virus infection in patients under two and a half hours, it can be performed directly at the point of care, and it eliminates the need to transport samples to health organizations which takes valuable time. It therefore leaves room for immediate treatment

Digital Epidemiology: This is a combination of large datasets and advanced analytics on the epidemic and it allows health care workers to access the information at a touch to aid the identification of the epidemic. This device will be adapted to aid in the pandemic and be used as a digital pathogen surveillance, it will also be used to monitor and predict disease outbreaks. It will be created to aid in health report and response especially in rural and war areas.

NB:this device with the following hardware's will also partake in crowdsourcing, that is the practice of obtaining information or input into a task or project by enlisting the service of a large number of people typically via the internet

C) Support your answer with a flowchart and an algorithm.



ALGORITHM:

1. Start
2. Input login application
3. If yes, then input menu; if no – exit
4. Read Menu
5. If yes, process appointment mssg alert, database monitoring, report, medical information, insurance agent, doctor in contact
6. Read Database Monitoring
7. Read MySQL Module data
8. Read Data Availability
9. If Data is not available, then GoTo MySQL Module Data, Else Read PHP Detection module
10. Read Decision rule module
11. Read Available
12. If available, GoTo Server; Else GoTo Update Server
13. If Update server is NO; GoTo Data Available, Else GoTo Server
14. Read Server
15. Print Final Result
16. END/STOP

D) Draw the Top-down or Bottom-up design approach of the application.