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| DEPARTMENT | AERONAUTICAL ENGINEERING |
| COURSE CODE | ENG 224 |
| COURSE TITLE  | STRUCTURED COMPUTER PROGRAMMING  |
| TOPIC | ASSIGNMENT ON APPLICATION DESIGN |
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TASK:

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), 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.

1. Design the application following the software development cycle.
2. Critically discuss the hardware and software features.
3. Support your answer with a flowchart and an algorithm.
4. Draw the Top-down or Bottom-up design approach of the application.

SOLUTION:

1. UNDERSTANDING THE SPECIFICATIONS:

The application that I am required to design, as specified, should be able to:

* Detect the presence of coronavirus in a person
* Display the details of the detection
* Display the Rate (degree) of the infection
* Store this data
* Transmit the data obtained wirelessly
* Accessible via the web
1. SYSTEM ANALYSIS:

The presence of coronavirus in a person can be detected by the symptoms they display, including shortness of breath, cough, fever. Furthermore, in severe cases, an infected person can develop pneumonia, severe acute respiratory syndrome and kidney failure.

Therefore, some numerical inputs required for this application would be:

* Temperature of body
* Temperature of forehead

Some YES/NO inputs required would be:

* Breathing stability
* Presence of a cough
* Presence of a headache
* Presence of sore eyes
* Loss of appetite
* Dehydration
* Feeling of weakness or tiredness
* Swelling in the legs or ankles
* Reduced amount of urine
* Persistent nausea
* Chest pain or pressure

The presence of some or all these symptoms will be an indication that the individual may be a carrier of the coronavirus. However, these symptoms may be as result of something else. Therefore, if by reason of these symptoms, a person is suspected of being a carrier of the virus, they must proceed to a designated medical facility for immediate screening.

The output of the application will be whether or not a person may be carrying the virus.

1. PROBLEM ANALYSIS

The application required is not so complex because it is not able to tell with total accuracy if a person has been infected with the virus, but simply displays a suspicion, based on the presence or absence of symptoms in the individual. If the result shows that a person might be a carrier of the virus, then they are to proceed to a medical facility for screening. Therefore, the application required is simple. This application however, should not be directly operated by many different individuals, but accessible online. The reason for this is that, if a person so happens to be a carrier of the virus, they would not transmit it to other people. Furthermore, some people develop fear when they feel that they may have caught the virus, because they do not want to be isolated. Therefore, the application should include some form of friendly explanation to the public that they do not need to be afraid of isolation because it is simply an effort to prevent any further spread of the virus; if they are found to be carriers, they will receive proper medical care and be released once the virus has left their system.

1. SOLUTION DESIGN

The design of the application I have put forward is a simple questionnaire, with a user-friendly design. The name of the application is “Corolusion”, formed from the words, ‘corona’ and ‘solution’. The visual appearance of the application will be an animated doctor with a smiling face, holding a piece of paper where the individual’s response to the questionnaire will be stored; this feature is meant to make the program interesting. The function of the app is to use the results from the questionnaire to form an output number, which will be a probability percentage of which the individual might have coronavirus. The program will have a visual display that looks like this:

**COROLUSION**

Click here to fill online Questionnaire

Well, **HELLO THERE FRIEND!!**

I’m doctor Steve, and I’ll attend to you today, but first I’ve got a few questions for you. Please fill in the questionnaire in the link below and I will get back to you when you are done. Sound Good?



1. TESTING AND DEBUGGING:

The application will use test data; the test data includes:

* Test in all parts of the world
* Test on all kinds of devices
* Test for performance on different internet speeds
* Test for accuracy of output, based on input
* Test for precision of output, based on a specific input.
1. INSTALLATION:

The application, once officially and properly licenced, will be provided to be downloadable on all electronic application stores, some examples being:

* Samsung Galaxy Store
* Google Play Store
* Play Station Store
* Apple App Store
* Amazon
* Opera Mobile Store

Furthermore, the services provided be the app will be accessible on the website, “www.corolusion.com”, for any user that requires the service, but is unable to download the app.

**Flowchart:**

OUTPUT “There is a ‘SUM’ percent probability that you have coronavirus”

STOP

START

YES

YES

YES

Do you have any difficulty breathing?

Do you have a cough?

Do you have a fever?

SUM \* 33

SUM + 0

SUM + 1

TRUE

FALSE

SUM + 1

SUM + 0

TRUE

FALSE

SUM + 1

SUM + 0

TRUE

FALSE

SUM = 0

**Algorithm:**

|  |
| --- |
| START |
| SUM = 0 |
| IS THERE A FEVER? |
| IF YES, ADD 1 TO SUM |
| ELSE, ADD 0 TO SUM |
| IS THERE A COUGH? |
| IF YES, ADD 1 TO SUM |
| ELSE, ADD 0 TO SUM |
| IS THERE A BREATHING DIFFICULTY? |
| IF YES, ADD 1 TO SUM |
| ELSE, ADD 0 TO SUM |
| MULTIPLY SUM BY 33 |
| PRINT “There is a ‘SUM’ percent probability that you have coronavirus” |
| STOP |

**Top-Down Design:**

AN APP TO HELP DIAGNOSE CORONAVIRUS

APP MUST BE BEAUTIFUL

CHECK FOR ANY BREATHING DIFFICULTY

CHECK FOR FEVER

CHECK FOR COUGH

APP MUST BE USER FRIENDLY

ATTRACTIVENESS OF THE APP

FUNCTIONALITY OF THE APP

 **Button-up Design:**

DESIGN THE PROGRAM TO USE THESE THREE SYMPTOMS TO GENERATE A PROBABILITY THAT THE PERSON HAS CORONAVIRUS

CREATE A PROGRAM TO DETERMINE IF A PERSON MIGHT HAVE CORONAVIRUS BASED ON THESE THREE SYMPTOMS

THIS PERSON MIGHT HAVE CORONAVIRUS

THIS PERSON HAS A COUGH

THIS PERSON ALSO HAS A FEVER

THIS PERSON ALSO HAS SOME DIFFICULTY BREATHING