Mark Gameng

CS 487 – HW 1

You are developing an automated covid warning system for campus

- The system shall detect a suspected carrier and alert the campus.

1. 2 functional requirements in unambiguous and measurable terms
   The system shall specify a person as a suspected carrier when there is reasonable assumption such as presenting covid symptoms or have been in contact with someone who was in proximity of someone with covid or with direct contact with someone who tested positive for covid or someone who is showing covid symptoms.
   Once the system has detected suspected carriers, it shall notify the campus administration as well as those suspected. The people who were in proximity within the last couple days of the suspected carriers are also notified. The suspected carrier and people who were in direct or indirect contact with them are to take a covid test or quarantine themselves before returning to campus or class. If a suspected carrier is tested to be safe and covid free, then those that were notified for that specific carrier are told that they are safe and don't have to take a test or quarantine.

2. 2 non-functional requirements to capture how well the system must work
   The system should notify the campus within an hour of it detecting a suspected carrier. The people notified are listed above in the functional requirements.
   The system should detect suspected carriers with at least 95% accuracy. The specifics of what a suspected carrier is explained above in the functional requirements.

3. Document a set of test cases (initial state, execution steps, final state) to prove that the system satisfies each requirement
   A student has tested positive and notified the system -> System looks at the path and classes of the student and detects suspected carriers. Example of suspected carriers would be classmates, professors of the student as well as students taking other classes in the vicinity of the student's class and path -> Notifies administration and suspected carriers with required/optional actions such as taking covid test or quarantining

   A student is showing covid symptoms -> Student notifies the system or administration -> System notifies the student to take a covid test to be sure. System also notifies suspected carriers due to student and have them self-diagnose for the time being. -> If student is positive then notify suspected carriers and have them quarantine or take covid test. If student was not positive, notify suspected carriers of it and resume as normal.

   Test cases above should achieve the 2 non-functional requirements. An example of test case achieving two non-functional requirements is below.

Student reports positive test and have recently gone to campus and class -> The system analyzes classes and path of the student to determine suspected carriers with 95% accuracy -> Within 30 minutes, the system notifies administration and suspected carriers.

4. Describe a process for the automatic capture and reporting of metrics for analyzing the system's performance relative to these requirements
   The system keeps a log of suspected carriers with their validity and covid status as well as the time it took for them to notify the campus. For example, when a student tests positive, the system detects suspected carriers due to their proximity to the student. The system notifies the suspected carriers and asks them if they were actually in the same class or were in proximity of the positive student. If they were, then the system were accurate in making them a suspected carrier. The system then marks the suspected carrier as being true/accurate. Thus, the system keeps track of the suspected carriers with their self-reported validity and covid test. The validity and accuracy of suspected carriers are calculated using these statistics. For each suspected carrier, the system also keeps track of how long it took for them to notify the campus and the carrier. Both the accuracy and average times are calculated automatically ever so often to make sure the system works well. The system can notify these metrics to administration and students so they can trust and believe the system works.