SOFTWARE ENGINEERING CS 487
Homework #4

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Design a hospital management system (HMS) for a large hospital (1 patient and several sensors per room; many rooms across multiple floors)
a) Caregivers must have real-time awareness of each patient's status
b) Caregivers must respond to patient emergencies quickly
c) Maintenance workers must respond to sensor failures quickly

Deliverable
1. Rewrite each requirement to remove ambiguity (1 pt)

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Original req given
Caregivers must have real-time awareness of each patient's status
Caregivers must respond to patient emergencies quickly
Maintenance workers must respond to sensor failures quickly

a) Caregivers must have real-time awareness of each patient's status like heart rate, blood pressure and other health measurements with the location of the room and caregivers ID.
-> The ambiguity related awareness is removed

b) Caregivers must respond to patient emergencies in a specific time frame using emergency level indication.
-> Quickly is not defined so that was edited to specific time frame

c) Maintenance workers must respond to sensor failures immediately and also there should be a maintainance cycle running so that there are no chances of sensor failure.
-> addressing sensor failure is added to remove ambiguity

2. Depict a UI which presents the status of each patient on a single screen and explain how it provides SA (1 pt)
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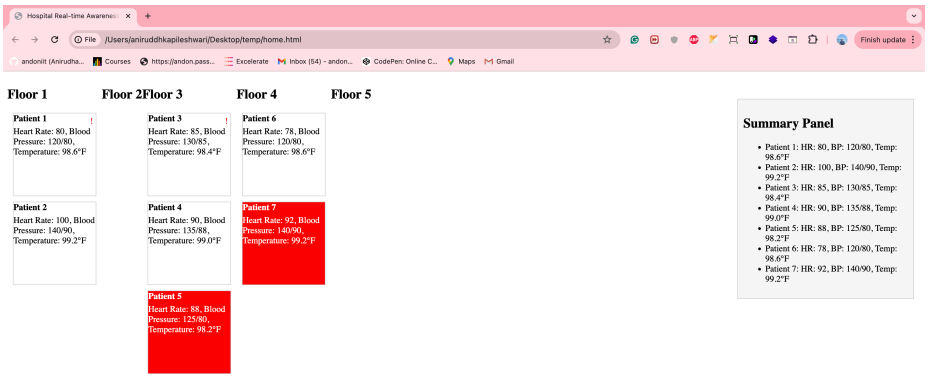

- Should display floor and rooms with the room number or name

- Each room should have vital signs indicator which is showing data in real time
- Showing colour dot to indicator patient condition (eg red is emergency and so on)
- It should provide location of the room and caregivers contact to contact in the case of emergency
- Provide a quick overview of entire hospital health status
- Here easy navigation is the key to build this hospital UI

This aspects provides situation averseness for the user to get all details in a single screen.

3. Specify a protocol that maximizes the likeliness of patient emergencies being handled quickly (1 pt)

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Implementing priority based alert system
Where

- Emergency alert - notification to nearby caregivers with the location and emergency status
- Update alart - if no one is nearby make the emergency more prioritise
- Non emergency alert - queue the non emergency alerts
- Assign required number of caregivers to balance the structure on each floor

4. Specify a protocol that maximizes the likeliness of sensor failures being fixed quickly (1 pt)

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- Continuously check the sensor status
- Create a sensor failure system and generate a maintainance ticket
- Ticket will have location and details of senior failure
- Assign maintainance workers with skills and expertise
- Give them emergency status to work on the sensors quickly
- Contenous monitoring to check the sensor in case of failure
- Keep a record of the no of times the sensor failed and give a notification to replace the sensor

5. Plot awareness over time for an emergency (1 pt)

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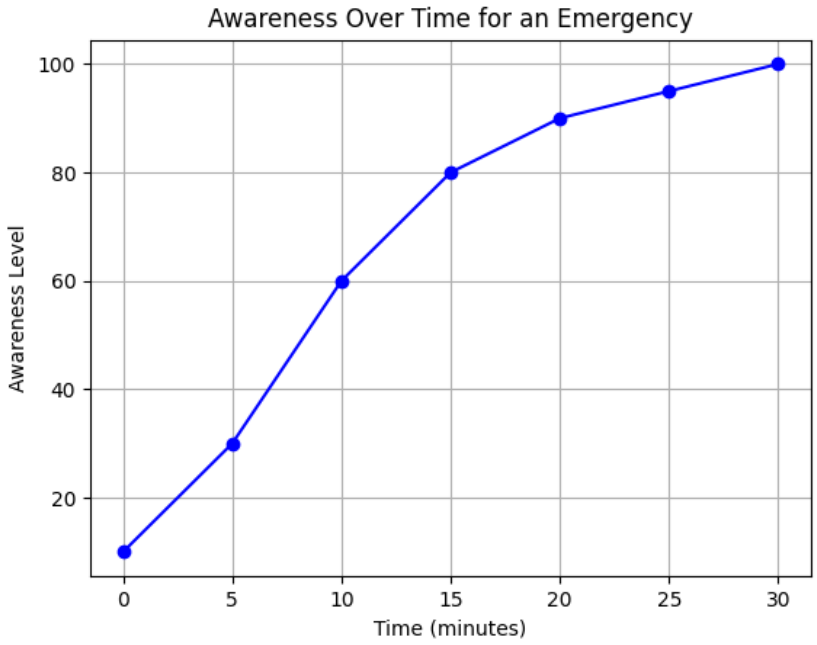


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Key Points:
0 minutes: Immediate awareness triggered by alarm system
5 minutes: Caregivers in proximity respond and assess the situation
10 minutes: Additional caregivers and resources mobilized if needed
15 minutes: Patient stabilized or transferred to higher care level
30 minutes: Post-emergency debriefing and review of response procedures
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