Group 6 - Term Project - Smart Security System
Test Data and Documentation

Group Members:

- Poorvi Lakkadi (G01389351)
- Prabath Reddy Sagili Venkata (G01393364)
- Pranitha Kakumanu (G01379534)
- Sai Hruthik Karumanchi (G01352466)
- Sai Sujith Reddy Ravula (G01409395)
- Sri Harish Jayaram (G01393332)

Functionality 1: Locking and Unlocking of System

In our Smart Home Security System, the first functionality is the locking and unlocking of the system, implemented using four buttons (button 1, button 2, button 3, button 4).

Test Case 1: Verify the activation/locking of the system.

1. Preconditions: The system is initially in inactive state/unlocked state.

2. Steps:

    - Hold button 1 for more than five seconds.

3. Expected outcome:

    - The Red LED should be turned ON.
    - The terminal window should display "LOCKED".

4. Actual outcome:

    - The Red LED is ON, and the terminal window shows "LOCKED".

Test Case 2: Verify the deactivation/unlocking of the system.

1. Preconditions: The system is active, in other words in Locked state.

2. Steps:

    - Enter the sequence: Press buttons 1, 3, 4, and 2 in this order.

3. Expected outcome:

    - The Green LED should be turned ON.
    - The Red LED should turn OFF.
    - The terminal window should display "UNLOCKED."

4. Actual outcome:

- The Green LED is turned ON, and the Red LED is turned OFF. The terminal window shows "UNLOCKED".

Test Case 3: Verify entering an incorrect sequence when the system is activated.

1. Preconditions: The system is active, in other words in Locked state.
2. Steps:
   - Enter an incorrect sequence.
3. Expected outcome:
   - The Red LED should stay ON.
4. Actual outcome:
   - The Red LED stays ON.

Functionality 2: Intrusion Detection System

In our smart home security system, the second functionality is the Intrusion Detection System, implemented using a PIR sensor, a buzzer, and a Red LED. The Motion Detection System is dependent on the Smart Locking and Unlocking system being active.

Test Case 1: Verify the system detects motion when it is active.

1. Preconditions: The system is active, in other words, is in Locked state.
2. Steps:
   - Move an object in front of the PIR sensor within one meter distance.
3. Expected outcome:
   - The Red LED should turn ON.
   - The buzzer should stay ON for five seconds and then turns OFF.
   - The terminal window should display "INTRUDER alert triggered".
4. Actual outcome:
   - The Red LED turns ON, and the buzzer continues for five seconds and then turns OFF. The terminal window shows "INTRUDER alert triggered".

Test Case 2: Verify the system doesn't detect motion when it is inactive.

1. Preconditions: The system is inactive, in other words, is in the Unlocked state.
2. Steps:

- Move an object in front of the PIR sensor within one meter distance.

3. Expected outcome:

- The Red LED and the buzzer should remain OFF.

4. Actual outcome:

- The Red LED and the buzzer remain turned OFF.

Test Case 3: Verify the system detects motion continuously when it is active.

1. Preconditions: The system is active, in other words, is in Locked state.

2. Steps:

- Continuously move an object in front of the PIR sensor.

3. Expected outcome:

- The Red LED should stay ON.
- The buzzer should trigger every time motion is detected.
  - The terminal window should display "INTRUDER alert triggered" every five seconds.

4. Actual outcome:

- The Red LED stays ON, and the buzzer gets triggered every time motion is detected by the PIR sensor. The system prints "INTRUDER alert triggered" every five seconds when there is continuous motion in front of the PIR sensor.

Functionality 3: Water Leakage Detection System

In our Smart Home Security System, the third functionality is the Water Leakage Detection System, utilizing a water level sensor, a buzzer, and a Red LED. This system works even when the system is inactive, in other words, is in Unlocked state.

Test Case 1: Verify the system detects water when it is active.

1. Preconditions: The system is active, in other words, is in Locked state.

2. Steps:

- Trigger the water level sensor by introducing water.

3. Expected outcome:

- The Red LED should turn ON.
- The buzzer is triggered for five seconds.

- The terminal window should display "Water Leakage Detected!" and "WATER LEAKAGE alert triggered."

4. Actual outcome:

- The Red LED is turned ON, and the buzzer gets triggered for five seconds. The text "Water Leakage Detected!" and "WATER LEAKAGE alert triggered" are printed on the terminal window.

Test Case 2: Verify the system detects water when it is inactive.

1. Preconditions: The system is inactive, in other words, is in Unlocked state.

2. Steps:

- Trigger the water level sensor by introducing water.

3. Expected outcome:

- The Red LED should turn ON.
- The buzzer gets triggered for five seconds.
- The terminal window should display "Water Leakage Detected!" and "WATER LEAKAGE alert triggered."

4. Actual outcome:

- The Red LED is turned ON, and the buzzer gets triggered for five seconds. The text "Water Leakage Detected!" and "WATER LEAKAGE alert triggered" are printed on the terminal window.

In summary, we have demonstrated all possible testcases in our Demonstration video and have hence achieved **100% coverage**.