

## SMART HOME AUTOMATION SYSTEM

This project simulates a smart home automation system with a graphical dashboard.

### Test Cases

- Test different automation rules.
- Test user interactions with the GUI.
- Test motion detection and light activation.

### Test Cases for Automation System:

#### 1. Discover Device Test:

- **Description:** Ensure that devices are correctly discovered and added to the automation system.
- **Steps:**
- **Action:** Add a SmartLight device to the system.
- **Expected Result:** Device added successfully.
- **Action:** Check if the device is present in the list of discovered devices.
- **Expected Result:** SmartLight device is present in the list.

#### 2. Toggle Device Test:

- **Description:** Verify that the toggle functionality turns devices on and off as expected.
- **Steps:**
- **Action:** Add a SmartLight device to the system.
- **Expected Result:** Device added successfully.
- **Action:** Toggle the device on.
- **Expected Result:** Device status is 'on'.
- **Action:** Toggle the device off.
- **Expected Result:** Device status is 'off'.

#### 3. Set Temperature Test:

- **Description:** Test the thermostat's ability to set and maintain a specific temperature.
- **Steps:**
- **Action:** Add a Thermostat device to the system.
- **Expected Result:** Device added successfully.
- **Action:** Set a target temperature.
- **Expected Result:** Thermostat reaches and maintains the specified temperature.

#### 4. Motion Detection Test:

- **Description:** Ensure that security cameras can detect motion.
- **Steps:**
- **Action:** Add a SecurityCamera device to the system.

- **Expected Result:** Device added successfully.
- **Action:** Simulate motion.
- **Expected Result:** Camera reports motion detection.

#### Test Cases for Monitoring Dashboard:

##### 1. Device Status Display Test:

- **Description:** Verify that the dashboard correctly displays the status of each device.
- **Steps:**
- **Action:** Add various devices to the system.
- **Expected Result:** Devices added successfully.
- **Action:** Check if the dashboard displays the status of each device correctly.
- **Expected Result:** Dashboard displays accurate device statuses.

##### 2. Toggle Device from Dashboard Test:

- **Description:** Test the ability to toggle devices on and off from the dashboard.
- **Steps:**
- **Action:** Add a SmartLight device to the system.
- **Expected Result:** Device added successfully.
- **Action:** Use the dashboard to toggle the device on.
- **Expected Result:** Device status is 'on'.

##### 3. Update Interval Test:

- **Description:** Verify that the dashboard updates at the specified interval.
- **Steps:**
- **Action:** Add devices to the system.
- **Expected Result:** Devices added successfully.
- **Action:** Observe the dashboard for updates at regular intervals.
- **Expected Result:** Dashboard updates at the specified interval.

##### 4. Console Output Test:

- **Description:** Ensure that the console output in the dashboard displays the simulation output.
- **Steps:**
- **Action:** Run a simulation.
- **Expected Result:** Simulation output is displayed in the dashboard console.