1) Introduction and General Description

In this project, we have written the system and integration tests for Smart Door Lock Automation application. The application has 3 compenents:

- Embedded system which is simulated
- Mobile application
- Web application

We have used yEd for model creation and gave these models to Graphwalker to create test scenarios and saved these generated sample test scenarios as .json file. We have created different models for each use-case.

Then, we have written our custom method which can be found in the test_scenarios_parse.py file to run these test scenarios automatically. In this method, we first parsed the json files in the form that we can use in pytest script.

Then, we have implemented edge functions which refers to action needed to be taken and test functions for vertexes which needed to be verified in the related test file. We used a script for pytest to call our functions and make verifications.

Then, we have used Allure to report test results.

2) Test Cases

We have created a model for each use-case. We have used these models both in integration and system testing. The system has 5 functionalities which are open the door, close the door, lock the door and open garden door. We assume that close the door functionality is provided by open the door functionality automatically after some time has passed.

Detailed descriptions for test cases as follow:

- Integration Testing Test Cases

Test Name	Open the House Door
Description	Pressing the open the door button for at least 3 seconds opens the door

Purpose	To ensure that pressing the open the door button for at least 3 seconds changes the door status as opened both in server and in mobile application
Functionality	
Input	Door status is Close/Unlocked
Expected Output	Door status is Open in embedded system and “Door status:Opened” text in mobile application

Test Name	Close the House Door
Description	Door is closed automatically after opening the door.
Purpose	To ensure that after the door is opened, door status changes automatically as closed both in server and in mobile application
Functionality	
Input	Appropriate time after opening the door
Expected Output	Door status is closed in embedded system and “Door status: Closed/ Unlocked” text in mobile application

Test Name	Lock the House Door
Description	Pressing the lock the door button for at least 3 seconds locks the door
Purpose	To ensure that pressing the lock the door button for at least 3 seconds changes the door status as closed/locked both in server and in mobile application
Functionality	
Input	Door status is Close/Unlocked
Expected Output	Door status is Close/Locked in embedded system and “Door status: Closed/Locked” text in mobile application

Test Name	Unlock the House Door
Description	Pressing the unlock the door button for at least 3 seconds unlocks the door

Purpose	To ensure that pressing the unlock the door button for at least 3 seconds changes the door status as closed/unlocked both in server and in mobile application
Functionality	
Input	Door status is Close/Locked
Expected Output	Door status is Close/Unlocked in embedded system and “Door status: Closed/Unlocked” text in mobile application

Test Name	Open the Garden Door
Description	Sliding the open the door slider for at least 3 seconds opens the garden door
Purpose	We cannot be sure if the door is opened or not(we do not have that data)
Functionality	
Input	Slider is in x=122
Expected Output	Slider is in x=879

- **System Testing Test Cases**

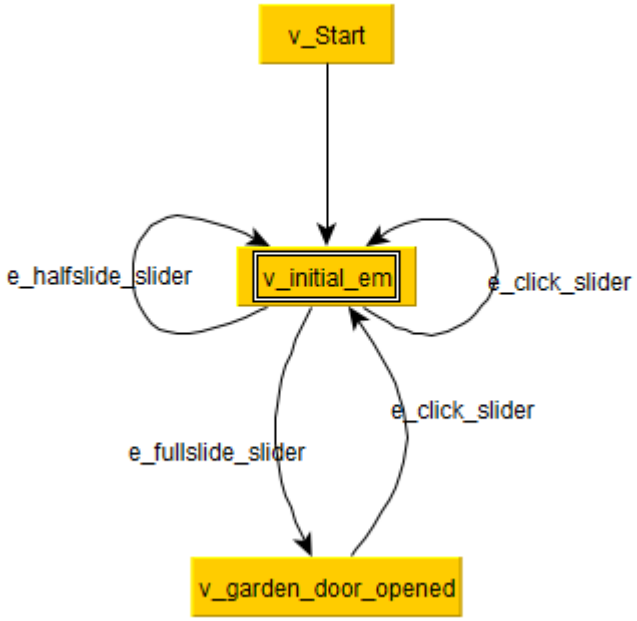
Test Name	Open the House Door
Description	Pressing the open the door button for at least 3 seconds opens the door
Purpose	To ensure that pressing the open the door button for at least 3 seconds changes the door status as opened both in server and in mobile application and in web application
Functionality	
Input	Door status is Close/Unlocked
Expected Output	Door status is Open in embedded system and “Door status:Opened” text in mobile application and web application

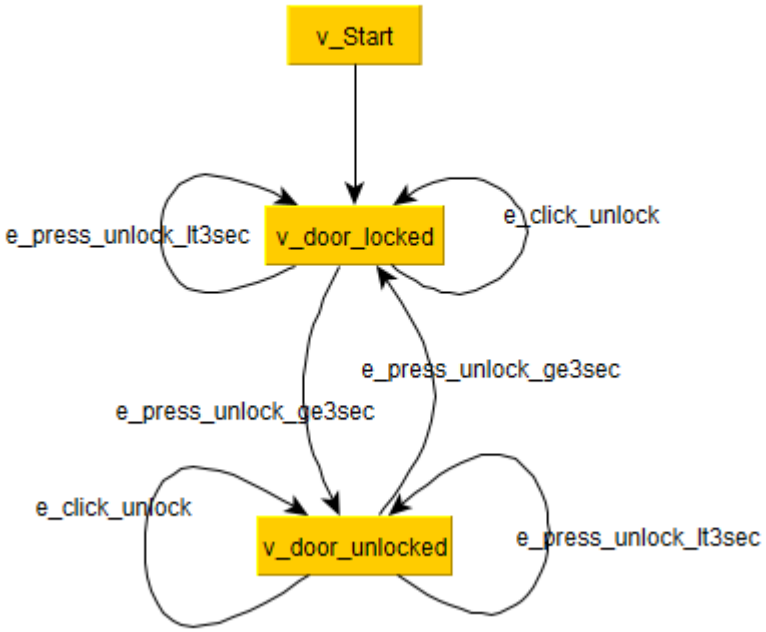
Test Name	Close the House Door
Description	Door is closed automatically after opening the door.
Purpose	To ensure that after the door is opened, door status changes automatically as closed both in server and in mobile application and in web application
Functionality	
Input	Appropriate time after opening the door
Expected Output	Door status is closed in embedded system and “Door status: Closed/ Unlocked” text in mobile application and web application

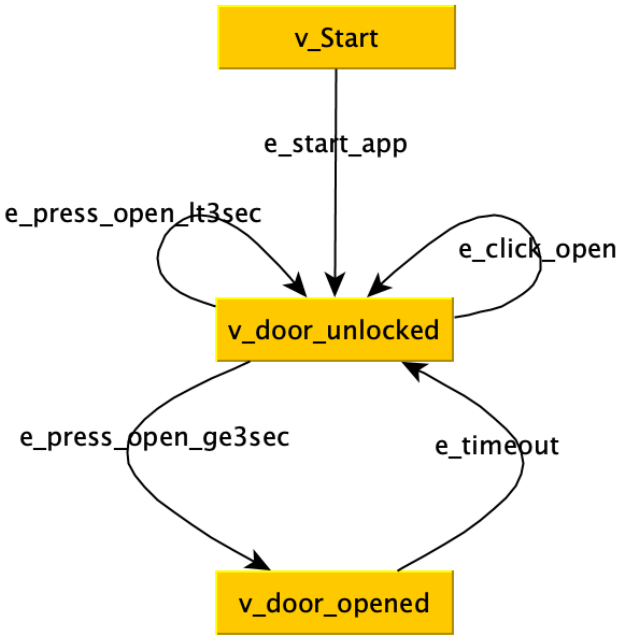
Test Name	Lock the House Door
Description	Pressing the lock the door button for at least 3 seconds locks the door
Purpose	To ensure that pressing the lock the door button for at least 3 seconds changes the door status as closed/locked both in server and in mobile application and in web application
Functionality	
Input	Door status is Close/Unlocked
Expected Output	Door status is Close/Locked in embedded system and “Door status: Closed/Locked” text in mobile application

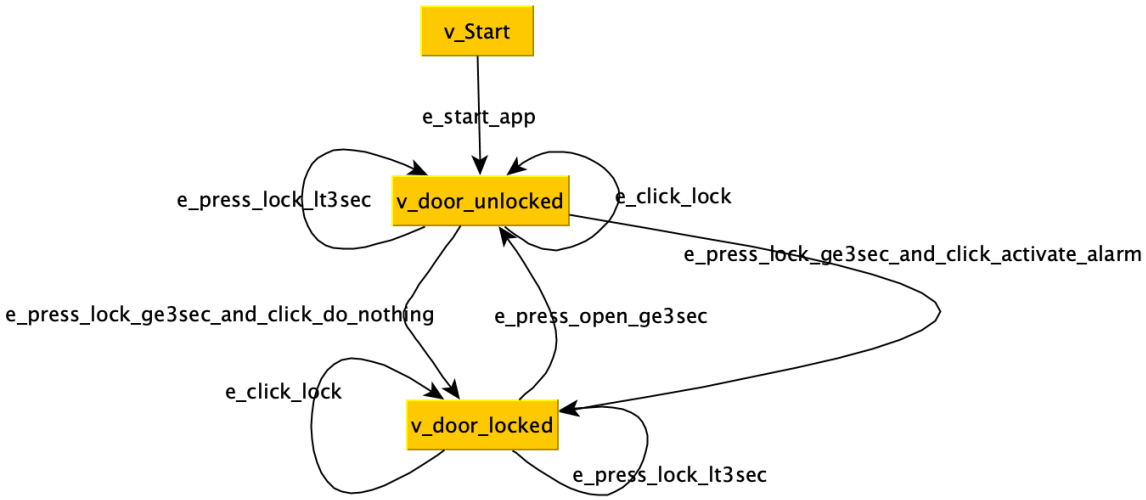
Test Name	Unlock the House Door
Description	Pressing the unlock the door button for at least 3 seconds unlocks the door
Purpose	To ensure that pressing the unlock the door button for at least 3 seconds changes the door status as closed/unlocked both in server and in mobile application and in web application
Functionality	
Input	Door status is Close/Locked
Expected Output	Door status is Close/Unlocked in embedded system and “Door status: Closed/Unlocked” text in mobile application and web application

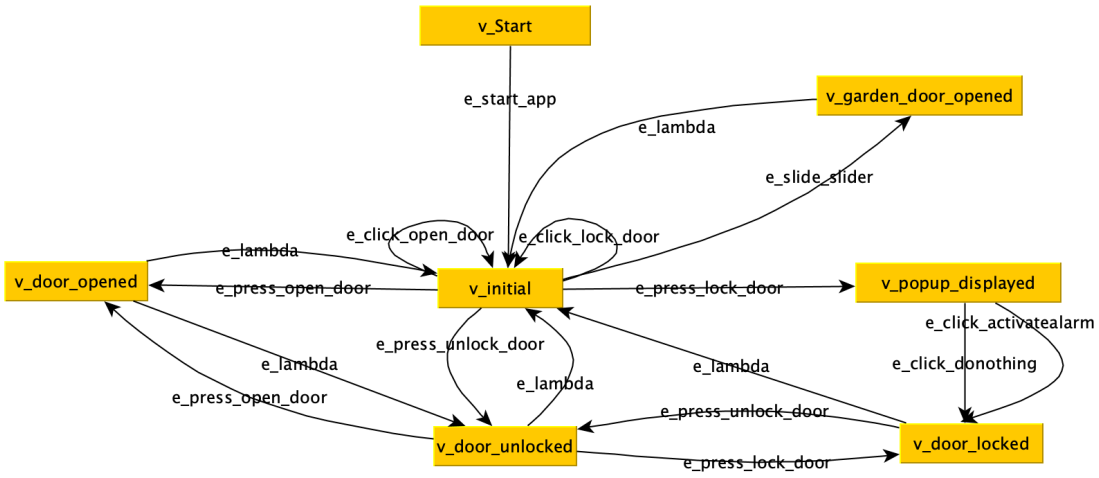
3) Models


v_Start
e_halfslide_slider
v_initial_em
e_click_slider
e_click_slider
e_fullslide_slider
v_garden_door_opened


v_Start
e_press_unlock_lt3sec
v_door_locked
e_click_unlock
e_press_unlock_ge3sec
e_press_unlock_ge3sec
e_click_unlock
v_door_unlocked
e_press_unlock_lt3sec


v_Start
e_start_app
e_press_open_lt3sec
e_click_open
v_door_unlocked
e_press_open_ge3sec
e_timeout
v_door_opened


v_Start
e_start_app
e_press_lock_lt3sec
v_door_unlocked
e_click_lock
e_press_lock_ge3sec_and_click_activate_alarm
e_press_lock_ge3sec_and_click_do_nothing
e_press_open_ge3sec
e_click_lock
v_door_locked
e_press_lock_lt3sec


v_Start
e_start_app
v_garden_door_opened
e_lambda
e_slide_slider
e_click_open_door
e_click_lock_door
e_lambda
v_door_opened
e_press_open_door
v_initial
e_press_lock_door
v_popup_displayed
e_click_activatealarm
e_press_unlock_door
e_lambda
e_lambda
e_click_donothing
e_press_open_door
e_press_unlock_door
v_door_unlocked
v_door_locked
e_press_lock_door