Eon

Temperature Control System - Den

Test Procedure

Revision History

Authors	Description of Change	Sections	Rev	Date
Erine Estrella Mohamed Jaafar Devontae Reid Sean Wulwick	Initial release	All	O	4-10-18
Mohamed Jaafar Devontae Reid	Started working on Test Case 1	Test Case 1	I	4-15-18
Mohamed Jaafar	Worked on Test Cases 2 and 4	Test Case 2 Test Case 4	II	4-17-18
Mohamed Jaafar	Updated Test Cases 2 and 4	Test Case 2 Test Case 4	III	4-26-18
Mohamed Jaafar Devonate Reid	Worked on Test Case 3	Test Case 3	IV	5-1-18
Mohamed Jaafar	Finalized document	All	V	5-5-18

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1   Team Description

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2   Introduction

The following test procedure cases serve to ensure that requirements that were specified in the **Written Requirements** document are properly incorporated in the system. The test cases range from Basic Functionality to Setting Up Calendar to Setting Temperature Based on City and finally, Setting User Defined Temperature.

Note 1: In all four test cases, the first five steps and the last step are identical, as they serve to describe initiating and setting up the system, which is necessary to perform any type of testing.

Note 2: In regards to the 6. Maintain Temperature Threshold section, which is described in the **Written Requirements** document, it is noted below that the room temperature never actually changes. Instead, the set point (temperature that is set by the user) slowly changes in order to reach that of the room temperature. This is because the project is solely a simulation and does not include a cooling/heating unit. This means that internal temperature will never actually change.

2.1   Identification

Requirement Document Tested:	Written Requirements document
Requirement Document Revision:	Revision III
Revision Release Date:	04-19-2018

3   Test Procedures

3.1   Test Case 1 - Basic Functionality

Description: This test validates the default settings and modes that are available to the user.

Precondition:

1) Power source available.

2) Internet connection available.

3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1	Apply power to Raspberry Pi Assembly.	Terminal windows is displayed on Adafruit Touchscreen	
2	Launch the GUI by entering interface.exe (the execution command).	The GUI is displayed, with the current temperature on the homepage.	RID-009
3	Establish the wifi connection from the computer by configuring the network settings.	Icon, indicating successful connection, is displayed.	RID-001
4	Wait for 30 seconds.	System will indicate successful fetching of weather data via an icon.	
5	Observe the display.	System displays the current updated temperature, along with weather forecast. "Current Temp: _____"	RID-009
6	Set the set point to be equal to the current temperature minus the threshold minus 1.	Heater turns on. System reflects that input by adjusting the set point, gradually, until it reaches the room temperature. Note that room temperature must not change in this case. (Refer to Introduction for additional information).	RID-008, RID-0010, RID-0011

7	Increase set point temperature by 1 degree.	Heater remains on.	
8	Increase set point temperature by 1 degree.	Heater remains on.	
9	Increase set point temperature by 1 degree.	Heater remains on.	
10	Increase set point temperature by 1 degree.	Heater shuts down.	RID-0011
11	Set the set point to be equal to the current temperature plus the threshold plus 1.	Cooler turns on. System reflects that input by adjusting the set point, gradually, until it reaches the room temperature. Note that room temperature must not change in this case. (Refer to Introduction for additional information).	RID-008, RID--0010, RID-012
12	Decrease set point temperature by 1 degree.	Cooler remains on.	
13	Decrease set point temperature by 1 degree.	Cooler remains on.	
14	Decrease set point temperature by 1 degree.	Cooler remains on.	
15	Decrease set point temperature by 1 degree.	Cooler shuts down.	RID-0012
16	Disable system.	System remains on, connection to wifi is lost, along with all basic functionality.	RID-0013
17	Re-enable system.	Connection to wifi is retained, along with all basic functionality.	RID-0013
18	Shutdown system by pressing appropriate button on interface.	System successfully shuts down; power removed from Raspberry Pi assembly.	

3.2   Test Case 2 - Setting up Calendar

Description: This test ensures that the system is able to receive the temperature from the Yahoo Weather API and displays it to the user.

Precondition:

1) Power source available.

2) Internet connection available.

3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1	Apply power to Raspberry Pi Assembly.	Terminal windows is displayed on Adafruit Touchscreen	
2	Launch the GUI by entering interface.exe (the execution command).	The GUI is displayed, with the current temperature on the homepage.	RID-009
3	Establish the wifi connection from the computer by configuring the network settings.	Icon, indicating successful connection, is displayed.	RID-001
4	Wait for 30 seconds.	System will indicate successful fetching of weather data via an icon.	
5	Observe the display.	System displays the current updated temperature, along with weather forecast. "Current Temp: _____"	RID-009
6	Launch the calendar	System displays the calendar for the current week	RID-002
7	Press a date on the calendar	System should ask user for temperature and specific time that they would like to set this temperature for???	RID-003

8		Cooler or Heater turns on until target temperature is reached for the current temperature event	RID-005
	Tracks changes in time throughout day	Event should repeat weekly	
9	Press date to allow user to modify temperature event	System should ask user which option they would like to choose (insert,delete,or modify)	RID-004
10	Shutdown system by pressing appropriate button on interface.	System successfully shuts down; power removed from Raspberry Pi assembly.	

3.3   Test Case 3 - Setting Temperature Based on City

Description: This test ensures that the system is able to receive the temperature from the Yahoo Weather API and displays it to the user.

Precondition:

   1) Power source available.

   2) Internet connection available.

   3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1	Apply power to Raspberry Pi Assembly.	Terminal windows is displayed on Adafruit Touchscreen	
2	Launch the GUI by entering interface.exe (the execution command).	The GUI is displayed, with the current temperature on the homepage.	RID-009
3	Establish the wifi connection from the computer by configuring the network settings.	Icon, indicating successful connection, is displayed.	RID-001
4	Wait for 30 seconds.	System will indicate successful fetching of weather data via an icon.	
5	Observe the display.	System displays the current updated temperature, along with weather forecast. "Current Temp: _____"	RID-009
6	Press button that allows you to enter a city of choice to track.	System prompts for entry of location through city name or zip code.	RID-006
7	Enter a valid zip code (such as 92834, which identifies Fullerton, CA).	System successfully identifies information and indicate fetching of weather data for Fullerton via an icon.	RID-006
8	Track changes in temperature.	Cooler or Heater turns on.	

9		System reflects that input by adjusting the set point, gradually, until it reaches the room temperature.

Note that room temperature must not change in this case. (Refer to Introduction for additional information). | |
10	Press button that allows you to enter a city of choice to track.	System prompts for entry of location through city name or zip code.	RID-006
11	Enter an invalid zip code (such as 0000, which is short by one number).	System fails to identify weather information and displays an error addressing the issue faced.	RID-007
12	Track potential changes in temperature.	No changes at all.	RID-007
13	Shutdown system by pressing appropriate button on interface.	System successfully shuts down; power removed from Raspberry Pi assembly.	

3.4   Test Case 4 - Setting User Defined Temperature

Description: This will test the system's ability to take user input, activate the system, force a disable of the system and re-enable of the system. It will also leave the system in vacation mode and retake the user input to show that it will not be activated in vacation mode.

Precondition:

1) Power source available.

2) Internet connection available.

3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1	Apply power to Raspberry Pi Assembly.	Apply power to Raspberry Pi Assembly.	
2	Launch the GUI by entering interface.exe (the execution command).	Launch the GUI by entering interface.exe (the execution command).	RID-009
3	Establish the wifi connection from the computer by configuring the network settings.	Icon, indicating successful connection, is displayed.	RID-001
4	Wait for 30 seconds.	System will indicate successful fetching of weather data via an icon.	
5	Observe the display.	System displays the current updated temperature, along with weather forecast. "Current Temp: _____"	RID-009
6	Press button that allows you to enter a user defined temperature.	The system should prompt for temperature entry by user.	RID-008
7	Set the set point to be equal to the current temperature minus the threshold minus 1.	Heater turns on. System reflects that input by adjusting the set point, gradually, until it reaches the room temperature.	RID-008, RID-0010, RID-0011

		Note that room temperature must not change in this case. (Refer to Introduction for additional information)	
8	Increase set point temperature by 1 degree.	Heater remains on.	
9	Increase set point temperature by 1 degree.	Heater remains on.	
10	Increase set point temperature by 1 degree.	Heater remains on.	
11	Increase set point temperature by 1 degree.	Heater shuts down.	RID-0011
12	Set the set point to be equal to the current temperature plus the threshold plus 1.	Cooler turns on. System reflects that input by adjusting the set point, gradually, until it reaches the room temperature. Note that room temperature must not change in this case. (Refer to Introduction for additional information)	RID-008, RID--0010, RID-012
13	Decrease set point temperature by 1 degree.	Cooler remains on.	
14	Decrease set point temperature by 1 degree.	Cooler remains on.	
15	Decrease set point temperature by 1 degree.	Cooler remains on.	
16	Decrease set point temperature by 1 degree.	Cooler shuts down.	RID-0012
17	Press button that enters Vacation mode.	System should confirm change to Vacation mode; set point is automatically saved as 40 degrees (F).	RID-0014
18	Observe change in temperature.	Set point temperature should incrementally reach that of the current temperature. Note that room temperature must not change in this case (Refer to Introduction for additional information)	RID-0014
19	As HVAC is running, intentionally prevent temperature from changing with any input from user.	System should disable itself completely; system should display an error message description of the issue.	RID-015 RID-016

| 20 | Shutdown system by pressing appropriate button on interface. | System successfully shuts down; power removed from Raspberry Pi assembly. | |

4. Verification Cross Reference Matrix

Requirement Identifier	Where Tested
RID-0001	Test 1: Basic Functionality Test 3: Setting Temperature Based on City Test 4: Setting User Defined Temperature
RID-0002	Test 2: Setting up Calendar
RID-0003	Test 2: Setting up Calendar
RID-0004	Test 2: Setting up Calendar
RID-0005	Test 2: Setting up Calendar
RID-0006	Test 3: Setting Temperature Based on City
RID-0007	Test 3: Setting Temperature Based on City
RID-0008	Test 1: Basic Functionality, Test 4: Setting User Defined Temperature
RID-0009	Test 1: Basic Functionality, Test 3: Setting Temperature Based on City
RID-0010	Test 1: Basic Functionality, Test 4: Setting User Defined Temperature
RID-0011	Test 1: Basic Functionality, Test 4: Setting User Defined Temperature
RID-0012	Test 1: Basic Functionality Test 4: Setting User Defined Temperature
RID-0013	Test 4: Setting User Defined Temperature
RID-0014	Test 4: Setting User Defined Temperature
RID-0015	Test 4: Setting User Defined Temperature
RID-0016	Test 4: Setting User Defined Temperature