Eon

Temperature Control System - Den

Use Case Report

Revision History

Authors	Description of Change	Sections	Rev	Date
Erine Estrella Mohamed Jaafar Devontae Reid Sean Wulwick	➢ Initial release	All	O	2-13-18
Erine Estrella Devontae Reid Mohamed Jaafar Sean Wulwick	➢ Corrected minor formatting issues ➢ Updated table of contents ➢ Added an example of the "Calendar" ➢ Updated Use Case Diagram ➢ Revised the Use case list ➢ Updated the Statement of Purpose ➢ Updated the Detailed Description	-Table of Contents -(2) Project Description -(2.1) Use case Diagram -(2.2) Use case List -(2.2.2) Setting Temperature -(2.2.5) Calendar Example	I	2-22-18
Erine Estrella Devontae Reid Mohamed Jaafar Sean Wulwick	➢ Corrected minor formatting issues ➢ Update Use Case Diagram ➢ Added section represented in Use Case Diagram ➢ Proofread the document, correcting spelling/ grammatical/ punctuation errors.	-Table of Contents -(2.1) Use case Diagram -(2.2.3) Setting Temperature - City Choice -(2.2.4) Setting Temperature - Calender -(2.2.6) Vacation Mode -(2.2.7) Enable/Disable -(2.2.8) Error Override	II	2-28-18

Table of Contents

1 Team Description

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2 Project Description

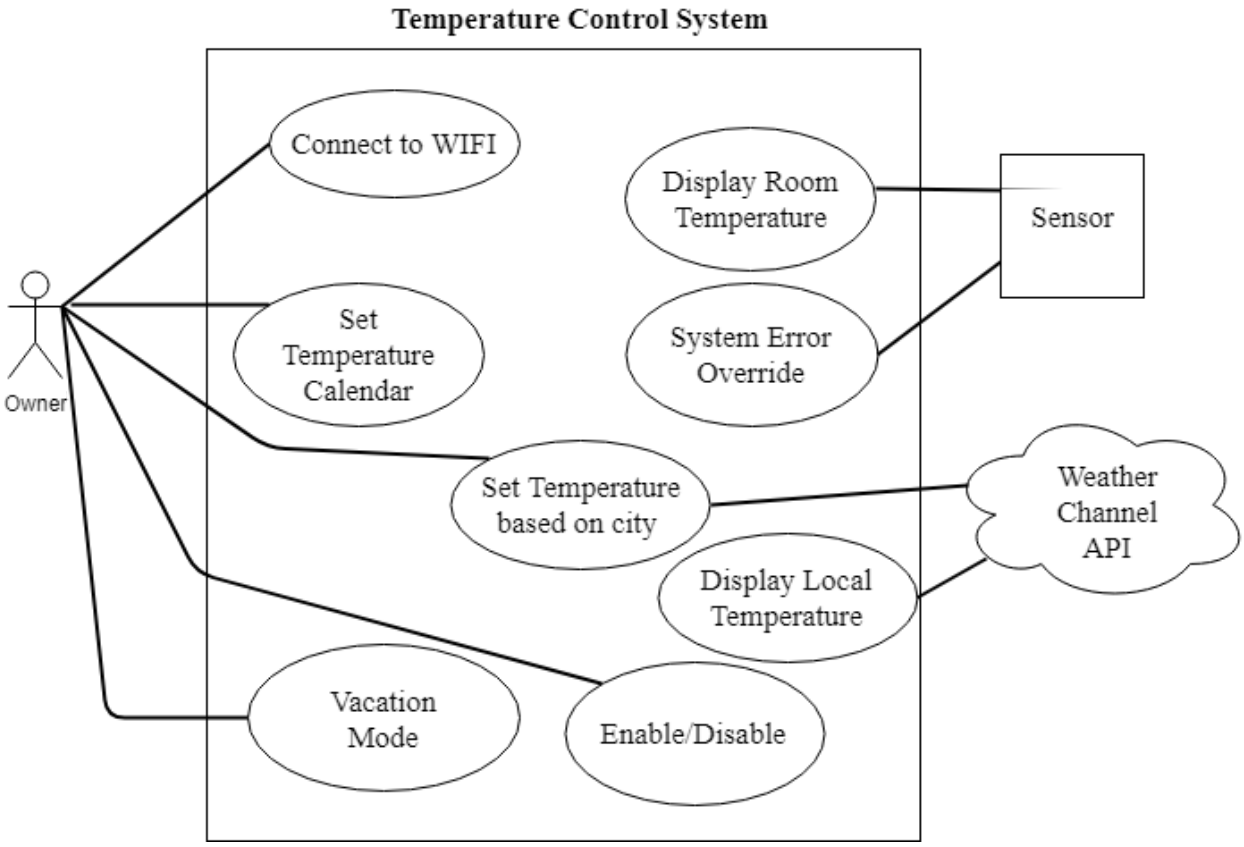
Statement of Purpose:

This project serves as a Temperature Control System, allowing the user to maintain their room's temperature according to their personal input.

Detailed Description:

A heating/cooling control system that is capable of taking user input (temperature in either Fahrenheit or Celsius) in and activating an HVAC (Heating, ventilation, and air conditioning) system. This system also allows for scheduling and an external temperature display based on location information that is collected from the weather channel API. The control system is also capable of maintaining a climate type within a room at a predefined threshold of temperature. For example, if the user would like a warm climate, a temperature of 80 degrees F can be maintained constantly.

2.1 Use Case Diagram



2.2 Use Case List

Use Case		
Sequence Number	**Actor**	**Goal**
1	User	Connect to WiFi
2	User/Weather Channel API	Set temperature based on city
3	User	Set temperature calendar
4	User	Enable / Disable System
5	User	Vacation Mode
6	Sensor	Display Room Temperature
7	Sensor	Activate System Error Override
8	Weather Channel API	Display Local Temperature

2.2.1 Connect to WiFi

Primary Actor: Owner

Goal in Context: Giving the system access to home WiFi.

Preconditions: System must be powered on.

Additional Description: Mostly simple setup procedures; most issues that arise are based on the connection to the user's WiFi.

2.2.1.1 Connection Made

1. User taps the Connect to WiFi button.
2. List of nearby WiFi connections is shown.
3. User selects desired WiFi connection.
4. Display prompts user for password to WiFi.
5. User correctly inputs password.
6. System connects to WiFi.

2.2.1.2 Desired Connection Unavailable

1. User taps the Connect to WiFi button.
2. List of nearby WiFi connections is shown.
3. User's desired WiFi connection is not displayed (failure).
4. Check personal router to ensure WiFi connection is available.

2.2.1.3 No Connections Available

1. User taps the Connect to Wifi button.
2. List of nearby WiFi connections is empty; simple text stating "No WiFi".
3. Reset system and try again.

4. If there are still no connections displayed in the list, call customer assistance.

2.2.2 Setting Temperature

Primary Actor: Owner

Goal in Context: User would like to set room temperature to their own specified temperature.

Preconditions: System must be on; sensor must be functional.

Additional Description: The user is able to set the room to a requested temperature that will be displayed and kept up to date using the temperature sensor within the room.

2.2.2.1 Set Temperature

1. User presses Display to activate.
2. User presses arrows under internal temperature read-out.
3. System displays a temperature equal to current internal temperature under Current Internal Temperature.
4. Using the arrows to the left and right of this read-out, the user sets the read-out to requested temperature.
5. System will kick on when requested temperature has not changed within 5 seconds.
6. When heating/cooling is completed and requested temperature is achieved, system will turn off HVAC system.
7. If the temperature moves outside of 5 degrees within 5 minutes of the system turning off, the system will turn back on to maintain the requested temperature. (This feature can be modified or disabled within the settings menu).

2.2.2.2 Sensor Error/HVAC error

1. If system has been active for 30 minutes with no significant change to room temperature, system will turn off the HVAC.
2. System will then display an error stating there is an issue with either the sensor or HVAC system and will inform user to call customer support.

2.2.3 Setting Temperature - City Choice

Primary Actor: Owner

Goal in Context: User would like to set room temperature to one that matches a certain location's temperature, which should be tracked.

Preconditions: System must be on; internet access.

Additional Description: The user must be able to choose a temperature depending on a city of their choice. For example, if the user lives in Los Angeles, CA, where it's currently 84 F, the user might choose to set the room temperature to that of Manhattan, NY, where its 51 F.

2.2.3.1 Set Temperature According to City

1. User touches the display in order to start the system up.
2. System displays current room temperature, along with any additional information (username, date, etc)
3. User chooses to search for a city by entering zip code.
4. User enters 10002 as input.
5. System display weather report for Manhattan, NY and asks user to confirm choice.
6. Temperature is set to 51 degrees and further changes in temperature are tracked.

2.2.3.2 City Not Found

1. User touches the display in order to start the system up.
2. System displays current temperature, along with any additional information (username, date, etc).
3. User chooses to search for a city by entering zip code.
4. User enters 00000 as input.
5. System is unable to detect city that corresponds to zip code entered.
6. User is informed of such error and asked to re-enter input or exit.
7. User finally enters valid input.
8. Temperature is set accordingly.

2.2.4 Setting Temperature - Calendar

Primary Actor: Owner

Goal in Context: User would like to set room temperature to a desired temperature at a given time on any given day.

Preconditions: System must be on.

Additional Description: This must be set up. This will then become a recurring event every week until cancelled or changed. This is also able to be disabled by the user using the vacation option in the system.

2.2.4.1 Set Temperature Event

1. User accesses the calendar on the system.
2. User presses the desired day of the event.
3. System will display an options box with times and a seperate options box with temperatures.
4. User will select time and temperature.
5. User will press the Confirm button.
6. System will then monitor time and temperature. If the temperature during that time of that day of the week does not match, the system will activate and cool/heat the dwelling.

2.2.4.2 Delete Temperature Event

1. User presses the Calendar on the system.
2. User selects day of requested deletion.

3. User selects Delete. Day of deletion could also be modified.
4. If there is only one, the event will be deleted without any other window.
5. If there are multiple events set on the given day, system will display them in a list.
6. User selects the requested-to-delete event.
7. System prompts user for confirmation, displaying the temperature and time of the event.
8. If correct, the user selects the Confirm option.
9. If incorrect, the user selects Cancel.
10. System will reset to list view.
11. Once confirmed or if it was the only event, system returns to main display; brief text box stating “Event Deleted”.

2.2.5 Calendar Example

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
6:30 am	70 F	70 F	65 F	65 F	70 F	70 F	70 F
6:00 am	70 F	70 F	60 F	65 F	70 F	70 F	65 F
7:00 am	70 F	70 F	60 F	65 F	70 F	70 F	65 F
7:30 am	70 F	70 F	60 F	65 F	70 F	70 F	65 F
8:00 am	70 F	70 F	60 F	65 F	70 F	70 F	65 F
8:30 am	70 F	70 F	60 F	65 F	70 F	70 F	65 F
9:00 am	65 F	off	off	off	off	off	65 F
9:30 am	65 F	off	off	off	off	off	65 F
10:00 am	65 F	off	off	off	off	off	65 F
10:30 am	65 F	off	off	off	off	off	65 F
11:00 am	65 F	off	off	off	off	off	65 F

2.2.6 Vacation Mode

Primary Actor: Owner

Goal in Context: User wants to disable system and all events for an unspecified amount of time and wishes to avoid pipe freeze.

Preconditions: System must be on.

Additional Description: This maintains a defined minimum temperature within the house. The system is only activated when needed and not during calendar events.

2.2.6.1 Enable

1. User activates display.
2. User presses the blue airplane button.
3. Airplane button turns red.

2.2.6.2 Disable

1. User activates display.
2. User presses the red airplane button.
3. Airplane button turns blue.

2.2.7 Enable/Disable

Primary Actor: Owner

Goal in Context: User wants to disable system and all events for an unspecified amount of time.

Preconditions: System must be on.

Additional Description: This turns the system completely off disallowing any activation of the system.

2.2.7.1 Disable

1. User activates display.
2. User long presses the blue airplane button.
3. Airplane button turns grey.

2.2.7.2 Enable

1. User activates display.
2. User presses the grey airplane button.
3. Airplane button turns blue.

2.2.8 System Error Override

Primary Actor: Sensor

Goal in Context: If there is no change in the temperature within the room in a finite amount of time, the system will be forced to a disabled state and an error message will be displayed on screen.

Preconditions: Malfunction in HVAC system

Additional Description: This turns the system completely off, disallowing any activation of the system.

2.2.8.1 Activation

1. Sensor sends input to system
2. System has temperature at activation stored.
3. A comparison is made at XX amount of time.
4. If there is no change or the temperature is moving opposite of intended temperature, the system is overridden and set in Disabled.
5. System displays an error.

2.2.8.2 Clearing Error

1. User reads error.
2. User corrects problem.
3. User presses Clear on the Error Message box.