Week 10 Test Plan
Team 3
“Heat-o-Matic”
12/03/2021
Team Members: Zheng Zhang, Luis Nadora, Luke Hoskam, Kai Han

Test Author:Zheng Zhang				
	Test Case Name:	System test	**Test ID #:**	
	Description:	Test system by using different methods to change the temperature of the environment, so as to observe after the smart heater has passed the webpage default temperature of 24°C. The heater can be switched on and off by changing the indoor temperature	**Type:**	□ white box ☑ black box □ _____
Tester Information				
	Name of Tester:	Zhengzhang, Kai Han	**Date:**	11/27/2021
	HW/SW Version:	1.0	**Time:**	2:00 pm
	Setup:	Use a hair dryer to raise the temperature for the DHT11 temperature sensor, and place it outdoors to reduce the temperature to simulate the indoor temperature		

TEST	Action	Expected Output：stepper motor state	PASS	FAIL	N/A	Comments
1	Open the window and place the board outside the window to lower the sensor temperature to 20 °C	The stepper motor rotates 180° and the heater turns on				Setting temperature less than the indoor temperature，system start to work，stepper motor rotates 180° and the heater turns on
2	Use a hair dryer to raise the temperature sensed to 26°C	The stepper motor rotates 180° and the heater turns off				Setting the temperature over the indoor temperature，system does not work，the steeper turns back to the original position.
3	Use a hair dryer to raise the temperature sensed to 28°C	The stepper motor not move and the heater turns off				Increasing the temperature after the system has already turned on the heater，the system keep to stay off.
4	Open the window and place the board outside the window to lower the sensor temperature to 20 °	The stepper motor rotates 180° and the heater turns on				Setting the temperature smaller than the indoor temperature，the system turns on again, stepper motor rotates 180° and the heater turns on
	Overall test result:					The project can perfectly work with the temperature change.

Detailed Description：Our project depends on the user setting the temperature to tell the system to turn the heater on or off. Users will set the specific temperature on the website, the DHT11 sensor will detect the temperature and send a digital signal to the esp32 microcontroller to move the heater knob in the appropriate position via the stepper motor. Therefore, proper communication between the input temperature and output stepper motor control is very important. We will test the system by simulating indoor temperature and using different methods to change the temperature of the environment, so as to observe the result after the smart heater has passed the webpage default temperature of 24°C. The heater should be switched on or off depending on the indoor temperature.

Test Author: Zheng Zhang

	Test Case Name:	Component tests	**Test ID #:**	
	Description:	Test to confirm the basic function of the heat-o-matic project.	**Type:**	☑white box □ black box □ _____

Tester Information

	Name of Tester:	Zheng Zhang, Kai Han	**Date:**	11/30/2021
	HW/SW Version:	1.0	**Time:**	4:00pm
	Setup:	Build the circuit on the breadboard and test the basic function of each component.		

STEP	Test part:	Expected Result	PASS	FAIL	N/A	Comments
1	DHT11 temperature sensor	DHT 11 can detect the surrounding temperature				The temperature sensor sometimes displays packet loss behavior, and occasionally displays nan°, but because the temperature sensor refreshes in real time and the frequency is twice per second, it does not affect the use of the function
2	Stepper motor	Stepper motor can accept the digital signal to Rotate 180°				The motor can successfully receive the signal to complete the work
3	Website display	Website can accept the ESP 32 offer IP , also can create it on the local host and normally display current temperature, user setting temperature, and system status				When multiple people connect to the same wifi hotspot, it may cause the website to display normally, should fix this bug.
4	OLED display	OLED can display the current temperature, user setting temperature and website IP				The OLED connection is correct and properly displays the information for the user
5	Websocket Connection	Users can use the website to set the expected temperature to make the heater turn on or off.				Websocket connection works properly between esp32 and the website.
	Overall test result:					The basic functions can be implemented very well. Although the DHT11 occasionally loses packets, it does not affect the use. The occasional behavior that cannot be displayed on the multi-person connection web page needs to be repaired.

Detialed Description：To make sure the project works well, we need to do the white box test to make sure every part of the project works well. So we will build each different part on a breadboard, to test if the function of every component works properly. We must test if the DHT11 temperature sensor can detect the surrounding temperature correctly, if the stepper motor can accept the digital signal to Rotate 180° to turn on or off the system, if the website can be created properly on the local host. We must also test if the OLED can display the current temperature, the desired temperature, and the website IP for the Websocket Connection so that the user can set the desired temperature from the website.
If each part individually functions properly then it illustrates that the function of the system as a whole functions properly as well.

Test Author:Luis Nadora				
	Test Case Name:	Button Test	**Test ID #:**	
	Description:	Press each button to ensure that it is being detected properly by the ESP32 Microcontroller.	**Type:**	□ white box ☑ black box □ _____
Tester Information				
	Name of Tester:		**Date:**	
	HW/SW Version:	1.0	**Time:**	
	Setup:	Observe the confirmation of each button press by looking at the output script via microcontroller program on the monitor.		

TEST	**Action**	**Expected Output**:	**PASS**	**FAIL**	**N/A**	**Comments**
1	Press Button A	Output Script on the monitor saying “Button A Was Pressed”				
2	Press Button B	Output Script on the monitor saying “Button B Was Pressed”				
3	Press Button C	Output Script on the monitor saying “Button C Was Pressed”				
4	Press Button D	Output Script on the monitor saying “Button D Was Pressed”				
	Overall test result:					

Detailed Description: The purpose of this test is to simply ensure that each of the buttons are correctly connected to the system and communicate properly with the rest of the system through the microcontroller. A simple program will be needed in order to conduct this test. If the result of any of the button tests results in a failure, there may be something incorrect with the assembly of the system. Check to ensure that the buttons are correctly connected to the appropriate pins of the microcontroller, and check the program to make sure that there are no errors resulting from the test code.