Unit Testing Report

for Smart Humidifier System

Project Team

Team 4

Date

2022-07-16

Team Information

고현서

Table of Contents

1   Introduction

1.1 Objectives

본 문서는 2022년 동국대학교의 캡스톤 디자인 강의의 실습과제를 설명한다. 실습과제는

스마트 가습기 시스템(SHS)을 아두이노와 앱인벤터를 통해 구현하는 것을 의미한다.

1.6 References

T4_2022_SRA_SHS_Ver5.0

T4_2022_UTP_SHS_Ver1.0

2   Unit test case specification

2.1   Test case specification identifier

<Table 1 : Test Design Identification>

Identifier	Feature(Process DFD)	Valid/ Invalid value
TEAM4_SHS_0_000_000	1.1.1 LCD_SET	Data Input : t = 25, h = 40
TEAM4_SHS_0_001_000	1.2.1 Water Level Inspection	Data Input : water_level = 90
TEAM4_SHS_0_001_001	1.2.1 Water Level Inspection	Data Input : water_level = 100
TEAM4_SHS_0_002_000	1.3.1 Mode Controller	Data Input : mode_set = "1",

		auto_control = 0
TEAM4_SHS_0_002_001	1.3.1 Mode Controller	Data Input : mode_set = "2", auto_control = 0
TEAM4_SHS_0_002_002	1.3.1 Mode Controller	Data Input : mode_set = "4", auto_control = 0
TEAM4_SHS_0_002_003	1.3.1 Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_002_004	1.3.1 Mode Controller	Data Input : mode_set = "6", auto_control = 0
TEAM4_SHS_0_003_000	1.3.2 Manual Mode Controller	Data Input : mode_set = "1", auto_control = 0
TEAM4_SHS_0_003_001	1.3.2 Manual Mode Controller	Data Input : mode_set = "2", auto_control = 0
TEAM4_SHS_0_003_002	1.3.2 Manual Mode Controller	Data Input : mode_set = "2", auto_control = 0
TEAM4_SHS_0_003_003	1.3.2 Manual Mode Controller	Data Input : mode_set = "1", auto_control = 0
TEAM4_SHS_0_003_004	1.3.2 Manual Mode Controller	Data Input : mode_set = "2",

		auto_control = 0
TEAM4_SHS_0_004_000	1.3.3 Auto Mode Controller	Data Input : mode_set = "4", auto_control = 0
TEAM4_SHS_0_004_001	1.3.3 Auto Mode Controller	Data Input : mode_set = "1", auto_control = 0
TEAM4_SHS_0_004_002	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_003	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_004	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_005	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_006	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_007	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_008	1.3.3 Auto Mode Controller	Data Input : mode_set = "5",

		auto_control = 0
TEAM4_SHS_0_004_009	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_010	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_011	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_012	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_004_013	1.3.3 Auto Mode Controller	Data Input : mode_set = "5", auto_control = 0
TEAM4_SHS_0_005_000	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 45
TEAM4_SHS_0_005_001	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 55
TEAM4_SHS_0_005_002	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0,

		mode_set = "4", temp = 18, humi = 65
TEAM4_SHS_0_005_003	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 17, humi = 45
TEAM4_SHS_0_005_004	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 45
TEAM4_SHS_0_005_005	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 55
TEAM4_SHS_0_005_006	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 65
TEAM4_SHS_0_005_007	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 45
TEAM4_SHS_0_005_008	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0,

		mode_set = "4", temp = 22, humi = 55
TEAM4_SHS_0_005_009	1.3.3.1 Auto Mode Control_ON	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 65
TEAM4_SHS_0_006_000	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 35
TEAM4_SHS_0_006_001	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 45
TEAM4_SHS_0_006_002	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 55
TEAM4_SHS_0_006_003	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 17, humi = 45
TEAM4_SHS_0_006_004	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0,

		mode_set = "4", temp = 24, humi = 35
TEAM4_SHS_0_006_005	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 45
TEAM4_SHS_0_006_006	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 55
TEAM4_SHS_0_006_007	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 35
TEAM4_SHS_0_006_008	1.3.3.2 Auto Mode Control_OFF	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 45
TEAM4_SHS_0_006_009	1.3.3.2 Auto Mode Control_OFF	mode_set = "4", temp = 18, humi = 55
TEAM4_SHS_0_007_000	1.4.1 Setting Mode Controller	Data Input : input_humi = "std", humi = 50, user_humi = 60,

		only_set = 1, higher_humi = 1
TEAM4_SHS_0_007_001	1.4.1 Setting Mode Controller	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1
TEAM4_SHS_0_007_002	1.4.1 Setting Mode Controller	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 40 , only_set = 1, higher_humi = 1, pause = 1
TEAM4_SHS_0_007_003	1.4.1 Setting Mode Controller	Data Input : user_humi = -10
TEAM4_SHS_0_007_004	1.4.1 Setting Mode Controller	Data Input : user_humi = 95
TEAM4_SHS_0_007_005	1.4.1 Setting Mode Controller	Data Input : user_humi = 80
TEAM4_SHS_0_007_006	1.4.1 Setting Mode Controller	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1
TEAM4_SHS_0_007_007	1.4.1 Setting Mode Controller	Data Input : input_humi = "std", humi = 50, user_humi = 60,

		humi_up = 70, only_set = 1, higher_humi = 1, pause = 1
TEAM4_SHS_0_007_008	1.4.1 Setting Mode Controller	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1

2.2 Test items

<Table 2 : Test Case Identification>

Test case Identifier	Input Specification	Output Specification
TEAM4_SHS_0_000_000	Data Input : t = 25, h = 40	"temperature : 25°C humidity : 40%" 출력
TEAM4_SHS_0_001_000	Data Input : commandInspectionData. water_level = 90	commandInspectionData.info_water = 1
TEAM4_SHS_0_001_001	Data Input : commandInspectionData.water_level	commandInspectionData.info_water = 0

	= 100	
TEAM4_SHS_0_002_000	Data Input : CommandData.mode_set = "1" CommandData.auto_control = 0	CommandData.mode_result = 30
TEAM4_SHS_0_002_001	Data Input : CommandData.mode_set = "2" CommandData.auto_control = 0	CommandData. mode_result = 31
TEAM4_SHS_0_002_002	Data Input : CommandData.mode_set = "4" CommandData.auto_control = 0	CommandData. mode_result = 1
TEAM4_SHS_0_002_003	Data Input : CommandData.mode_set = "5" CommandData.auto_control = 0	CommandData.manualActiveCommandData. mode_result = 34,
TEAM4_SHS_0_002_004	Data Input : CommandData.mode_set = "6" CommandData.auto_control = 0	CommandData. mode_result = 40
TEAM4_SHS_0_003_000	Data Input : manualActiveCommandData.mode_s	manualActiveCommandData.result_manual_o n = 30,

	et = "1" manualActiveCommandData auto_control = 0	manualActiveCommandData.auto_control = 0
TEAM4_SHS_0_003_ 001	Data Input : manualActiveCommandData.mode_s et = "2" CommandData. auto_control = 1	manualActiveCommandData.result_manual_o n = 40
TEAM4_SHS_0_003_ 002	Data Input : manualActiveCommandData.mode_s et = "2" manualActiveCommandData .auto_c ontrol = 0	manualActiveCommandData.mode_result= 31, manualActiveCommandData.auto_control = 0
TEAM4_SHS_0_003_ 003	Data Input : manualActiveCommandData.mode_s et = "1" manualActiveCommandData.auto_co ntrol = 0	manualActiveCommandData.mode_result = 30 manualActiveCommandData.auto_control = 0
TEAM4_SHS_0_003_	Data Input :	autoActiveCommandData.mode_result = 31

004	autoActiveCommandData.mode_set = "2", CommandData.auto_control = 0	autoActiveCommandData.auto_control = 0
TEAM4_SHS_0_004_ 000	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_contr ol = 0	autoActiveCommandData.mode_result = 1
TEAM4_SHS_0_004_ 001	Data Input : autoActiveCommandData.mode_set ="1", autoActiveCommandData.auto_contr ol = 0	autoActiveCommandData.mode_result = 40
TEAM4_SHS_0_004_ 002	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_contr ol = 0	autoActiveCommandData.mode_result = 34

TEAM4_SHS_0_004_003	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_control = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_004	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_control = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_005	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_control = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_006	Data Input : autoActiveCommandData.mode_set ="5",	autoActiveCommandData.mode_result = 34

	autoActiveCommandData.auto_control = 0	
TEAM4_SHS_0_004_007	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_control = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_008	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_control = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_009	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_control = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_	Data Input :	autoActiveCommandData.mode_result = 34

010	autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_contr ol = 0	
TEAM4_SHS_0_004_ 011	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_contr ol = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_ 012	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_contr ol = 0	autoActiveCommandData.mode_result = 34
TEAM4_SHS_0_004_ 013	Data Input : autoActiveCommandData.mode_set ="5", autoActiveCommandData.auto_contr	autoActiveCommandData.mode_result = 34

	ol = 0	
TEAM4_SHS_0_005_000	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 24, autoActiveCommandData.humi =45	autoActiveCommandData. result_auto_humi_succeed= 32
TEAM4_SHS_0_005_001	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 22, autoActiveCommandData.humi =55	autoActiveCommandData. result_auto_humi_succeed= 32
TEAM4_SHS_0_005_	Data Input :	autoActiveCommandData.

002	autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 18, autoActiveCommandData.humi =65	result_auto_humi_succeed= 32
TEAM4_SHS_0_005_ 003	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 17, autoActiveCommandData.humi =45	autoActiveCommandData.result_auto_humi_succeed = 40
TEAM4_SHS_0_005_ 004	Data Input : autoActiveCommandData.mode_set = "4",	aut autoActiveCommandData. result_auto_humi_succeed= 32

	autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 24, autoActiveCommandData.humi =45	
TEAM4_SHS_0_005_005	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 22, autoActiveCommandData.humi =55	autoActiveCommandData. result_auto_humi_succeed= 32
TEAM4_SHS_0_005_006	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0,	autoActiveCommandData. result_auto_humi_succeed= 32

	autoActiveCommandData.temp = 18, autoActiveCommandData.humi =65	
TEAM4_SHS_0_005_ 007	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_contr ol = 0, autoActiveCommandData.temp = 24, autoActiveCommandData.humi =45	autoActiveCommandData. result_auto_humi_succeed= 32
TEAM4_SHS_0_005_ 008	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_contr ol = 0, autoActiveCommandData.temp = 22,	autoActiveCommandData. result_auto_humi_succeed= 32

	autoActiveCommandData.humi =55	
TEAM4_SHS_0_005_009	Data Input : autoActiveCommandData.mode_set = "4", autoActiveCommandData.auto_control = 0, autoActiveCommandData.temp = 18, autoActiveCommandData.humi =65	autoActiveCommandData. result_auto_humi_succeed= 32
TEAM4_SHS_0_006_000	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 35	autoActiveCommandData.result_auto_humi_fail = 33
TEAM4_SHS_0_006_001	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 45	autoActiveCommandData.result_auto_humi_fail = 33
TEAM4_SHS_0_006_002	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 55	autoActiveCommandData.result_auto_humi_fail = 33

TEAM4_SHS_0_006_ 003	Data Input : auto_control = 0, mode_set = "4", temp = 17, humi = 45	autoActiveCommandData.result_auto_humi_f ail = 40
TEAM4_SHS_0_006_ 004	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 35	autoActiveCommandData.result_auto_humi_f ail = 33
TEAM4_SHS_0_006_ 005	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 45	setActiveCommandData.result_set_mode_off = 33
TEAM4_SHS_0_006_ 006	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 55	setActiveCommandData.result_set_mode_off = 33
TEAM4_SHS_0_006_ 007	Data Input : auto_control = 0, mode_set = "4", temp = 24, humi = 35	autoActiveCommandData.result_auto_humi_f ail = 33
TEAM4_SHS_0_006_ 008	Data Input : auto_control = 0, mode_set = "4", temp = 22, humi = 45	setActiveCommandData.result_set_mode_off = 33

TEAM4_SHS_0_006_ 009	Data Input : auto_control = 0, mode_set = "4", temp = 18, humi = 55	setActiveCommandData.result_set_mode_off = 33
TEAM4_SHS_0_007_ 000	Data Input : input_humi = "std", humi = 50, user_humi = 60, only_set = 1, higher_humi = 1	setActiveCommandData.result_set_mode_on = 35
TEAM4_SHS_0_007_ 001	Data Input : input_humi = "std", Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1	setActiveCommandData.result_set_mode_on = 36
TEAM4_SHS_0_007_ 002	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 40 , only_set = 1, higher_humi = 1, pause = 1	setActiveCommandData.result_set_mistake = 40
TEAM4_SHS_0_007_ 003	Data Input : user_humi = -10	setActiveCommandData.result_set_mistake = 37
TEAM4_SHS_0_007_	Data Input : user_humi = 95	setActiveCommandData.result_set_mistake =

004		37
TEAM4_SHS_0_007_005	Data Input : user_humi = 80	setActiveCommandData.result_set_mistake = 40
TEAM4_SHS_0_007_006	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1	setActiveCommandData.result_set_mode_on = 36
TEAM4_SHS_0_007_007	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1	setActiveCommandData.result_set_mode_on = 36
TEAM4_SHS_0_007_008	Data Input : input_humi = "std", humi = 50, user_humi = 60, humi_up = 70, only_set = 1, higher_humi = 1, pause = 1	setActiveCommandData.result_set_mode_on = 36

2.3   Input specifications

<Table 1 : Test Design Identification> 참조

8.4   Output Specifications

<Table 2 : Test Case Identification> 참조

3   Environmental needs

UTP_Ver1.0, 9 Environmental needs 참조

4.   Unit test summary report identifier

4.1   Test summary report identifier

Test Case Identifier	Result
TEAM4_SHS_0_000_000	Passed
TEAM4_SHS_0_001_000	Passed
TEAM4_SHS_0_001_001	Passed
TEAM4_SHS_0_002_000	Passed
TEAM4_SHS_0_002_001	Passed
TEAM4_SHS_0_002_002	Passed
TEAM4_SHS_0_002_003	Passed
TEAM4_SHS_0_002_004	Passed
TEAM4_SHS_0_003_000	Passed

TEAM4_SHS_0_003_001	Passed
TEAM4_SHS_0_003_002	Passed
TEAM4_SHS_0_003_003	Passed
TEAM4_SHS_0_003_004	Passed
TEAM4_SHS_0_004_000	Passed
TEAM4_SHS_0_004_001	Passed
TEAM4_SHS_0_004_002	Passed
TEAM4_SHS_0_004_003	Passed
TEAM4_SHS_0_004_004	Passed
TEAM4_SHS_0_004_005	Passed
TEAM4_SHS_0_004_006	Passed
TEAM4_SHS_0_004_007	Passed
TEAM4_SHS_0_004_008	Passed
TEAM4_SHS_0_004_009	Passed
TEAM4_SHS_0_004_010	Passed
TEAM4_SHS_0_004_011	Passed

TEAM4_SHS_0_004_012	Passed
TEAM4_SHS_0_004_013	Passed
TEAM4_SHS_0_005_000	Passed
TEAM4_SHS_0_005_001	Passed
TEAM4_SHS_0_005_002	Passed
TEAM4_SHS_0_005_003	Passed
TEAM4_SHS_0_005_004	Passed
TEAM4_SHS_0_005_005	Passed
TEAM4_SHS_0_005_006	Passed
TEAM4_SHS_0_005_007	Passed
TEAM4_SHS_0_005_008	Passed
TEAM4_SHS_0_005_009	Passed
TEAM4_SHS_0_006_000	Passed
TEAM4_SHS_0_006_001	Passed
TEAM4_SHS_0_006_002	Passed
TEAM4_SHS_0_006_003	Passed

TEAM4_SHS_0_006_004	Passed
TEAM4_SHS_0_006_005	Passed
TEAM4_SHS_0_006_006	Passed
TEAM4_SHS_0_006_007	Passed
TEAM4_SHS_0_006_008	Passed
TEAM4_SHS_0_006_009	Passed
TEAM4_SHS_0_007_000	Passed
TEAM4_SHS_0_007_001	Passed
TEAM4_SHS_0_007_002	Passed
TEAM4_SHS_0_007_003	Passed
TEAM4_SHS_0_007_004	Passed
TEAM4_SHS_0_007_005	Passed
TEAM4_SHS_0_007_006	Passed
TEAM4_SHS_0_007_007	Passed
TEAM4_SHS_0_007_008	Passed

4.2   Evaluation

Total Test Case : 56

Passed : 56

Failed : 0