

Unit Testing Plan

for Coffee Machine System

- Test Plan
- Test Design Specification
- Test Cases Specification

Project Team

Team 2

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Table of Contents

1	Introduction	4
1.1	Objectives.....	4
1.2	Background	4
1.3	Scope.....	4
1.4	Project plan	4
1.5	Configuration management plan.....	4
1.6	References.....	4
2	Test items	4
3	Features to be tested.....	7
4	Features not to be tested	8
5	Approach.....	8
6	Item pass/fail criteria.....	8
7	Unit test design specification.....	8
7.1	Test design specification identifier	8
7.2	Features to be tested	8
7.3	Approach refinements.....	8
7.4	Test identification	9
7.5	Feature pass/fail criteria	14
8	Unit test case specification.....	14
8.1	Test case specification identifier	14
8.2	Test items	19

8.3	Input specifications.....	19
8.4	Output specifications.....	19
9	Testing tasks	20
10	Environmental needs	20
11	Unit Test deliverables.....	20
12	Schedules	20

1 Introduction

1.1 Objectives

본 문서는 2016년 건국대학교의 소프트웨어공학 개론 강의의 실습과제를 설명한다. 실습 과제는 coffee machine을 소프트웨어로 구성된 가상의 시스템으로 구현하는 것이다.

1.2 Background

1.1 Scope

Coffee machine은 사용자의 요청에 따라 machine의 상태를 체크한 후 커피를 추출한다.

2016SE 수업을 통해 진행하게 될 프로젝트는 coffee machine을 가상 시스템으로 구현하는 것으로, coffee machine은 자신의 상태를 관리하여 사용자에게 알려주고, 사용자로부터 명령 및 입력 내용을 받아 출력을 만들어내는 역할을 한다. 모든 시스템은 SW만으로 구현한다. HW가 필요한 부분은 SW모듈을 만들어 가상의 HW를 구현한다.



1.3 Project plan

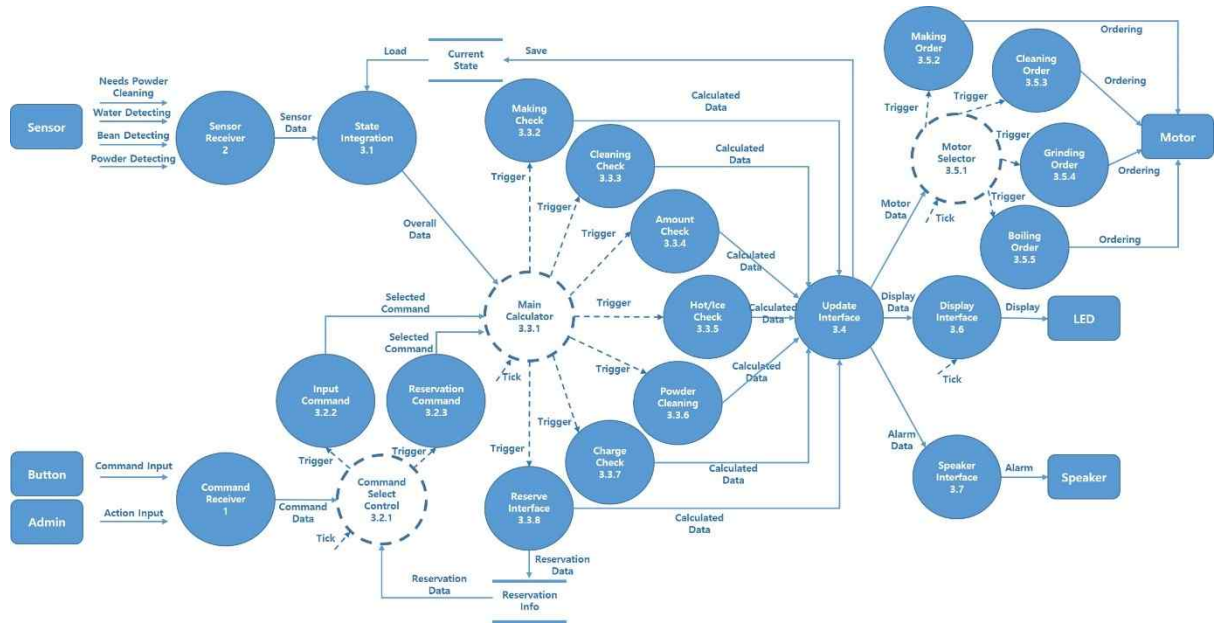
1.4 Configuration management plan

1.5 References

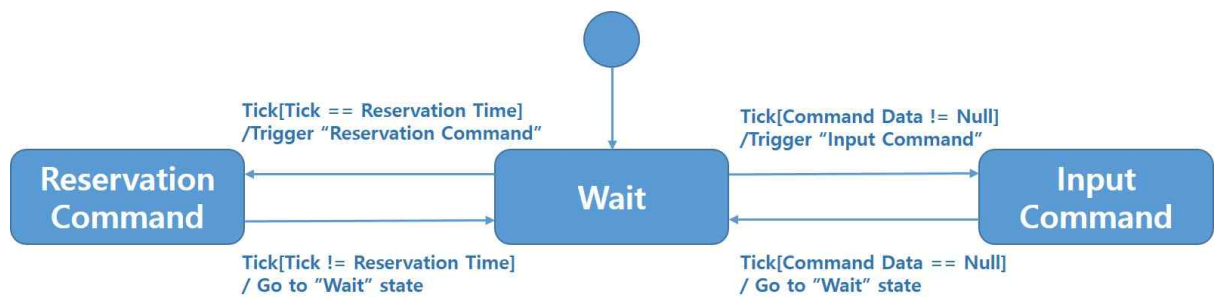
2 Test items

Coffee Machine System을 구성하는 단위 모듈들을 Test한다. 각 모듈들이 특정 input에 대하여 원하는 output을 만들어 내는지 Test하며, 잘못된 값에 대한 예외처리를 하는지 Test한다. Test item은 SRA 자료로부터 작성되었다.

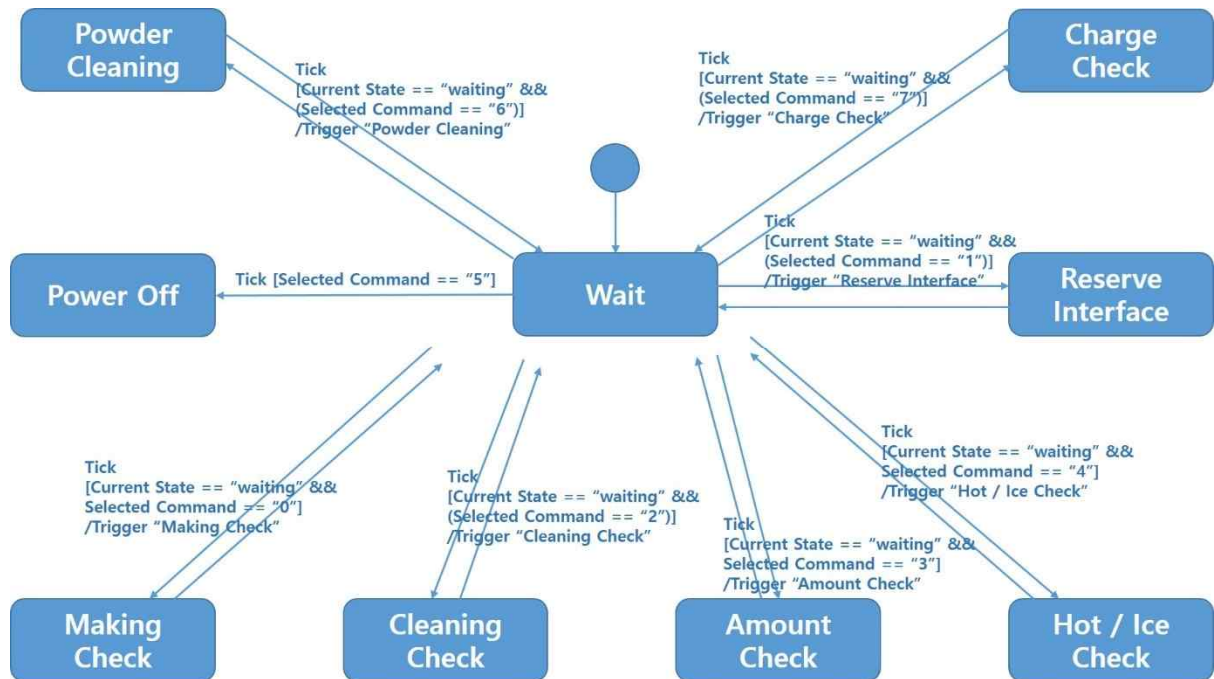
(1) Overall DFD for Coffee Machine System



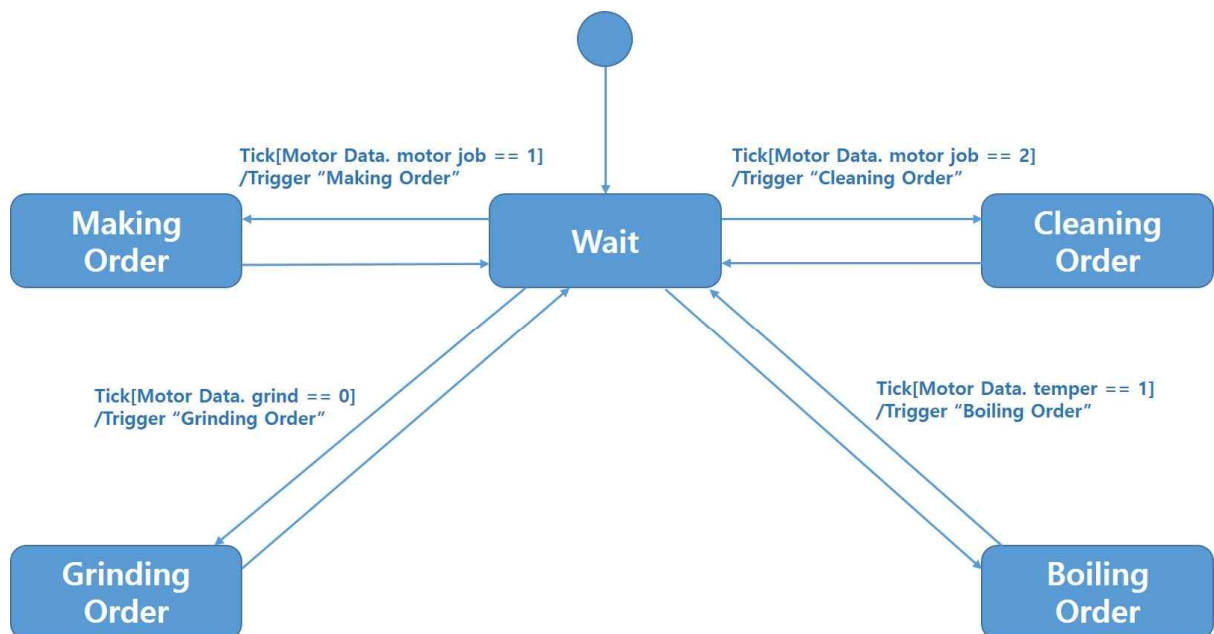
(2) State Transition Diagram for 3.2.1 Command Select Control



(3) State Transition Diagram for 3.3.1 Main Calculator



(4) State Transition Diagram for 3.5.1 Motor Selector



3 Features to be tested

(1) Process in SRA : 각 프로세스가 가지고 있는 요구사항을 만족하는 지를 Test한다.

(2) Modules in SDS : 각 모듈이 가지고 있는 데이터 인터페이스를 Test한다.

<Table1 Testing Process(DFD) 리스트>

ID	Name	Description
3.2.1	Command Select Control	Reservation Data를 분석하여 Input Command와 Reservation Command를 선별해서 Trigger 한다.
3.2.2	Input Command	사용자로부터 실시간으로 입력 받은 Command Data를 Selected Command로 바꿔준다.
3.2.3	Reservation Command	예약된 Command Data를 Selected Command로 바꿔준다.
3.3.1	Main Calculator	Overall Data 정보와 Selected Command를 바탕으로 수행되어야 할 계산 프로세스를 Trigger 한다.
3.3.2	Making Check	커피 추출 시 커피 가루의 상태, 커피의 양, 물의 양을 계산하여 각각의 경우에 대하여 error code를 만들어 내고, 각 명령에 대한 edit code를 생산하여 Calculated Data를 만든다.
3.3.3	Cleaning Check	청소 시에 필요한 물의 양을 계산하여 명령 실행 가능 여부에 따라 error code를 생산하여 Calculated Data를 만든다.
3.3.4	Amount Check	현재 상태가 대기중 인지를 확인하여 농도 변경이 현재 가능한지 여부에 따라 error code를 생산하여 Calculated Data를 만든다.
3.3.5	Hot/Ice Check	현재 상태가 대기중 인지를 확인하여 온도 변경이 현재 가능한지 여부에 따라 error code를 생산하여 Calculated Data를 만든다.
3.3.6	Powder Cleaning	현재 커피 가루 상태를 확인하여 커피 가루 제거가 가능한지 여부에 따라 error code를 생산하여 Calculated Data를 만든다.
3.3.7	Charge Check	현재 상태가 대기중 인지를 확인하여 재료 충전이 현재 가능한지 여부에 따라 error code를 생산하여 Calculated Data를 만든다.
3.3.8	Reservation Interface	현재 상태가 대기중 인지를 확인하여 현재 예

		약이 가능한지 여부에 따라 error code를 생산하여 Calculated Data를 만든다.
3.4	Update Interface	Calculated Data의 error code와 edit code를 확인하여 Motor에 수행해야할 Order Data를 전달한다.
3.5.1	Motor Selector	Motor Data의 motor job과 temp, grind data를 확인하여 현재 Motor가 수행해야 할 작업을 결정한다.

4 Features not to be tested

단순 Data 입력과 UI 출력에 관계된 프로세스는 테스트에서 제외한다.

5 Approach

Coffee Machine System의 Program Source Code 및 Unit Test를 위한 Test Code는 Cygwin (gcc) 환경에서 이루어지며 Program Source Code의 변경 및 수정 사항은 지속적으로 통합되고 테스트된다.

6 Item pass/fail criteria

각 모듈은 설정한 input 값에 대하여 기대되는 output 값이 나와야 한다.

7 Unit test design specification

7.1 Test design specification identifier

CMS_[Category]_000

7.2 Features to be tested

<Table1 Testing Process(DFD) 리스트> 참조

7.3 Approach refinements

각 Process specification에 명시된 내용을 바탕으로 Test Cases를 생성한다.

7.4 Test identification

< Table2 Test Design Identification >

Identifier	Feature(Process DFD)	Valid / Invalid value
CMS_RESERVE_DATA_001	3.2.1 Command Select Control	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,0,0}
CMS_RESERVE_DATA_002	3.2.1 Command Select Control	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,1,0}
CMS_RESERVE_DATA_003	3.2.1 Command Select Control	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,0,1}
CMS_RESERVEVE_DATA_004	3.2.1 Command Select Control	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,1,1}
CMS_InputCommand_Sample_01	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"0",1,1,1}
CMS_InputCommand_Sample_02	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"1",0,0,0}
CMS_InputCommand_Sample_03	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"2",0,0,0}
CMS_InputCommand_Sample_04	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"2",1,0,0}
CMS_InputCommand_Sample_05	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"2",2,0,0}
CMS_InputCommand_Sample_06	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"3",0,0,0}
CMS_InputCommand_Sample_07	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"4",0,0,0}
CMS_InputCommand_Sample_08	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"4",1,0,0}
CMS_InputCommand_Sample_09	3.2.2 Input	COMMAND_DATA(command,

	Command	option, type, amount) : {"4",2,0,0}
CMS_InputCommand_Sample_10	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"4",3,0,0}
CMS_InputCommand_Sample_11	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"tog",0,0,0}
CMS_InputCommand_Sample_12	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"@",0,0,0}
CMS_InputCommand_Sample_13	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"clp",0,0,0}
CMS_InputCommand_Sample_14	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"chrg",0,0,10}
CMS_InputCommand_Sample_15	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"chrg",0,1,100}
CMS_InputCommand_Sample_16	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"chrg",0,2,0}
CMS_InputCommand_Sample_17	3.2.2 Input Command	COMMAND_DATA(command, option, type, amount) : {"chrg",0,3,0}
CMS_RESERVE_COMMAND_SAMPLE_01	3.2.3 Reservation Command	selected_command : {0}
CMS_RESERVE_COMMAND_SAMPLE_02	3.2.3 Reservation Command	selected_command : {1}
CMS_RESERVE_COMMAND_SAMPLE_03	3.2.3 Reservation Command	selected_command : {2}
CMS_MAIN_CALCULATOR_01	3.3.1 Main Calculator	selected_command : {0}
CMS_MAIN_CALCULATOR_02	3.3.1 Main Calculator	selected_command : {1}
CMS_MAIN_CALCULATOR_03	3.3.1 Main Calculator	selected_command : {2}
CMS_MAIN_CALCULATOR_04	3.3.1 Main Calculator	selected_command : {3}
CMS_MAIN_CALCULATOR_05	3.3.1 Main Calculator	selected_command : {4}
CMS_MAIN_CALCULATOR_06	3.3.1 Main Calculator	selected_command : {5}

	Calculator	
CMS_MAIN_CALCULATOR_07	3.3.1 Main Calculator	selected_command : {6}
CMS_MAIN_CALCULATOR_08	3.3.1 Main Calculator	selected_command : {7}
CMS_MAKING_CHECK_01	3.3.2 Making Check	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {0} powder_state : {1}
CMS_MAKING_CHECK_02	3.3.2 Making Check	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {10} powder_state : {0}
CMS_MAKING_CHECK_03	3.3.2 Making Check	cur_state : {1} water_amt : {100} cur_amt : {0} coffee_amt : {10} powder_state : {0}
CMS_MAKING_CHECK_04	3.3.2 Making Check	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {0} powder_state : {0}
CMS_MAKING_CHECK_05	3.3.2 Making Check	cur_state : {0} water_amt : {100} cur_amt : {1} coffee_amt : {10} powder_state : {1}
CMS_MAKING_CHECK_06	3.3.2 Making Check	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {10} powder_state : {2}
CMS_CLEANING_CHECK_01	3.3.3 Cleaning Check	cur_state : {0} water_amt : {500}
CMS_CLEANING_CHECK_02	3.3.3 Cleaning	cur_state : {0}

	Check	water_amt : {400}
CMS_CLEANING_CHECK_03	3.3.3 Cleaning Check	cur_state : {1} water_amt : {500}
CMS_AMOUNT_CHECK_01	3.3.4 Amount Check	cur_state : {0} amount : {1}
CMS_AMOUNT_CHECK_02	3.3.4 Amount Check	cur_state : {1} amount : {1}
CMS_HOT_ICE_CHECK_01	3.3.5 Hot/Ice Check	cur_state : {0}
CMS_HOT_ICE_CHECK_02	3.3.5 Hot/Ice Check	cur_state : {1}
CMS_POWDER_CLEANING_01	3.3.6 Powder Cleaning	cur_state : {0} powder_state : {2}
CMS_POWDER_CLEANING_02	3.3.6 Powder Cleaning	cur_state : {0} powder_state : {1}
CMS_POWDER_CLEANING_03	3.3.6 Powder Cleaning	cur_state : {1} powder_state : {500}
CMS_CHARGE_CHECK_01	3.3.7 Charge Check	cur_state : {0} ingredi_type : {1} ingredi_amt : {100}
CMS_CHARGE_CHECK_02	3.3.7 Charge Check	cur_state : {1} ingredi_type : {1} ingredi_amt : {100}
CMS_RESERVATION_INTERACE_01	3.3.8 Reservation Interface	cur_state : {0} reserve_type : {0}
CMS_RESERVATION_INTERACE_02	3.3.8 Reservation Interface	cur_state : {0} reserve_type : {1}
CMS_RESERVATION_INTERACE_03	3.3.8 Reservation Interface	cur_state : {1} reserve_type : {1}
CMS_UPDATE_01	3.4 Update Interface	job_code : {0} error_code : {0} edit_code : {0}
CMS_UPDATE_02	3.4 Update Interface	job_code : {0} error_code : {1} edit_code : {1}
CMS_UPDATE_03	3.4 Update Interface	job_code : {1} error_code : {0} edit_code : {0}

CMS_UPDATE_04	3.4 Update Interface	job_code : {2} error_code : {0} edit_code : {0}
CMS_UPDATE_05	3.4 Update Interface	job_code : {3} error_code : {0} edit_code : {0}
CMS_UPDATE_06	3.4 Update Interface	job_code : {4} error_code : {0} edit_code : {0}
CMS_UPDATE_07	3.4 Update Interface	job_code : {5} error_code : {0} edit_code : {0}
CMS_UPDATE_08	3.4 Update Interface	job_code : {6} error_code : {0} edit_code : {0}
CMS_UPDATE_09	3.4 Update Interface	job_code : {0} error_code : {1} edit_code : {0}
CMS_UPDATE_10	3.4 Update Interface	job_code : {7} error_code : {0} edit_code : {0}
CMS_UPDATE_11	3.4 Update Interface	job_code : {7} error_code : {2} edit_code : {4}
CMS_MOTOR_DATA_SAMPLE_01	3.5.1 Motor Selector	motor_job : {0} temp : {0} grind : {0}
CMS_MOTOR_DATA_SAMPLE_02	3.5.1 Motor Selector	motor_job : {1} temp : {0} grind : {0}
CMS_MOTOR_DATA_SAMPLE_03	3.5.1 Motor Selector	motor_job : {1} temp : {1} grind : {0}
CMS_MOTOR_DATA_SAMPLE_04	3.5.1 Motor Selector	motor_job : {1} temp : {1} grind : {1}
CMS_MOTOR_DATA_SAMPLE_05	3.5.1 Motor Selector	motor_job : {2} temp : {1}

		grind : {1}
CMS_MOTOR_DATA_SAMPLE_06	3.5.1 Motor Selector	motor_job : {3} temp : {1} grind : {1}

7.5 Feature pass/fail criteria

각 input 값에 대하여 범위 밖의 값에 대해서는 예외처리 값이 나와야 하고, 범위 내의 값에 대해서는 specification에 부합하는 output이 나와야 한다.

8 Unit test case specification

8.1 Test case specification identifier

< Table3 Test Case Identification >

Identifier	Input Specification	Output Specification
CMS_RESERVE_DATA_001	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,0,0}	Input Command
CMS_RESERVE_DATA_002	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,1,0}	Reserve Command
CMS_RESERVE_DATA_003	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,0,1}	Reserve Command
CMS_RESERVE_DATA_004	RESRV_DATA(coffee_hour, coffee_min, cleaning_hour, cleaning_min, is_coffee, is_cleaning) : {1,30,1,30,1,1}	Reserve Command
CMS_InputCommand_Sample_01	COMMAND_DATA(command, option, type, amount) : {"0",1,1,1}	Exception Handling
CMS_InputCommand_Sample_02	COMMAND_DATA(command, option, type, amount) : {"1",0,0,0}	Command.order : 0

CMS_InputCommand_Sample_03	COMMAND_DATA(command, option, type, amount) : {"2",0,0,0}	Command.order : 1 Reserve_type : 0
CMS_InputCommand_Sample_04	COMMAND_DATA(command, option, type, amount) : {"2",1,0,0}	Command.order : 1 Reserve_type : 1
CMS_InputCommand_Sample_05	COMMAND_DATA(command, option, type, amount) : {"2",2,0,0}	Command.order : 1 Reserve_type : 2
CMS_InputCommand_Sample_06	COMMAND_DATA(command, option, type, amount) : {"3",0,0,0}	Command.order : 2
CMS_InputCommand_Sample_07	COMMAND_DATA(command, option, type, amount) : {"4",0,0,0}	Command.order : 3 Amount : 0
CMS_InputCommand_Sample_08	COMMAND_DATA(command, option, type, amount) : {"4",1,0,0}	Command.order : 3 Amount : 1
CMS_InputCommand_Sample_09	COMMAND_DATA(command, option, type, amount) : {"4",2,0,0}	Command.order : 3 Amount : 2
CMS_InputCommand_Sample_10	COMMAND_DATA(command, option, type, amount) : {"4",3,0,0}	Command.order : 10
CMS_InputCommand_Sample_11	COMMAND_DATA(command, option, type, amount) : {"tog",0,0,0}	Command.order : 4
CMS_InputCommand_Sample_12	COMMAND_DATA(command, option, type, amount) : {"@",0,0,0}	Command.order : 5
CMS_InputCommand_Sample_13	COMMAND_DATA(command, option, type, amount) : {"clp",0,0,0}	Command.order : 6
CMS_InputCommand_Sample_14	COMMAND_DATA(command, option, type, amount) : {"chrg",0,0,10}	Command.order : 7 Ingredi_type : 0 Ingredi_amt : 10
CMS_InputCommand_Sample_15	COMMAND_DATA(command, option, type, amount) :	Command.order : 7 Ingredi_type : 1

	{"chrg",0,1,100}	Ingredi_amt : 100
CMS_InputCommand_Sample_16	COMMAND_DATA(command, option, type, amount) : {"chrg",0,2,0}	Command.order : 7 Ingredi_type : 2
CMS_InputCommand_Sample_17	COMMAND_DATA(command, option, type, amount) : {"chrg",0,3,0}	Command.order : 10
CMS_RESERVE_COMMAND_SAMPLE_01	selected_command : {0}	Exception Handling
CMS_RESERVE_COMMAND_SAMPLE_02	selected_command : {1}	Command.order : 0 ls_coffee : 0
CMS_RESERVE_COMMAND_SAMPLE_03	selected_command : {2}	Command.order : 2 ls_cleaning : 0
CMS_MAIN_CALCULATOR_01	selected_command : {0}	Making check
CMS_MAIN_CALCULATOR_02	selected_command : {1}	Reservation Interface
CMS_MAIN_CALCULATOR_03	selected_command : {2}	Cleaning check
CMS_MAIN_CALCULATOR_04	selected_command : {3}	Amount check
CMS_MAIN_CALCULATOR_05	selected_command : {4}	Hot/Ice check
CMS_MAIN_CALCULATOR_06	selected_command : {5}	Power off
CMS_MAIN_CALCULATOR_07	selected_command : {6}	Powder cleaning
CMS_MAIN_CALCULATOR_08	selected_command : {7}	Charge check
CMS_MAKING_CHECK_01	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {0} powder_state : {1}	job_code : 0 error_code : 0 edit_code : 0
CMS_MAKING_CHECK_02	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {10} powder_state : {0}	job_code : 0 error_code : 0 edit_code : 1
CMS_MAKING_CHECK_03	cur_state : {1} water_amt : {100} cur_amt : {0} coffee_amt : {10} powder_state : {0}	job_code : 0 error_code : 1
CMS_MAKING_CHECK_04	cur_state : {0} water_amt : {100} cur_amt : {0}	job_code : 0 error_code : 2

	coffee_amt : {0} powder_state : {0}	
CMS_MAKING_CHECK_05	cur_state : {0} water_amt : {100} cur_amt : {1} coffee_amt : {10} powder_state : {1}	job_code : 0 error_code : 3
CMS_MAKING_CHECK_06	cur_state : {0} water_amt : {100} cur_amt : {0} coffee_amt : {10} powder_state : {2}	job_code : 0 error_code : 4
CMS_CLEANING_CHECK_01	cur_state : {0} water_amt : {500}	job_code : 2 error_code : 0
CMS_CLEANING_CHECK_02	cur_state : {0} water_amt : {400}	job_code : 2 error_code : 2
CMS_CLEANING_CHECK_03	cur_state : {1} water_amt : {500}	job_code : 2 error_code : 1
CMS_AMOUNT_CHECK_01	cur_state : {0} amount : {1}	job_code : 3 error_code : 0
CMS_AMOUNT_CHECK_02	cur_state : {1} amount : {1}	job_code : 3 error_code : 1
CMS_HOT_ICE_CHECK_01	cur_state : {0}	job_code : 4 error_code : 0
CMS_HOT_ICE_CHECK_02	cur_state : {1}	job_code : 4 error_code : 1
CMS_POWDER_CLEANING_01	cur_state : {0} powder_state : {2}	job_code : 5 error_code : 0
CMS_POWDER_CLEANING_02	cur_state : {0} powder_state : {1}	job_code : 5 error_code : 2
CMS_POWDER_CLEANING_03	cur_state : {1} powder_state : {500}	job_code : 5 Exception Handling
CMS_CHARGE_CHECK_01	cur_state : {0} ingredi_type : {1} ingredi_amt : {100}	job_code : 6 error_code : 0 edit_code : 1 new_data : 100
CMS_CHARGE_CHECK_02	cur_state : {1} ingredi_type : {1}	job_code : 6 error_code : 1

	ingredi_amt : {100}	
CMS_RESERVATION_INTERACE_01	cur_state : {0} reserve_type : {0}	job_code : 1 error_code : 0 is_coffee : 1 edit_code : 0
CMS_RESERVATION_INTERACE_02	cur_state : {0} reserve_type : {1}	job_code : 1 error_code : 0 is_cleaning : 1 edit_code : 1
CMS_RESERVATION_INTERACE_03	cur_state : {1} reserve_type : {1}	job_code : 1 error_code : 1
CMS_UPDATE_01	job_code : {0} error_code : {0} edit_code : {0}	Making update
CMS_UPDATE_02	job_code : {0} error_code : {1} edit_code : {1}	Making update / need grinding
CMS_UPDATE_03	job_code : {1} error_code : {0} edit_code : {0}	Reserve_update
CMS_UPDATE_04	job_code : {2} error_code : {0} edit_code : {0}	Cleaning_update
CMS_UPDATE_05	job_code : {3} error_code : {0} edit_code : {0}	Amount_update
CMS_UPDATE_06	job_code : {4} error_code : {0} edit_code : {0}	Temperature_update
CMS_UPDATE_07	job_code : {5} error_code : {0} edit_code : {0}	Powder_update
CMS_UPDATE_08	job_code : {6} error_code : {0} edit_code : {0}	Charge_update
CMS_UPDATE_09	job_code : {0} error_code : {1} edit_code : {0}	Making update / No need grinding

CMS_UPDATE_10	job_code : {7} error_code : {0} edit_code : {0}	Exception Handling
CMS_UPDATE_11	job_code : {7} error_code : {2} edit_code : {4}	Exception Handling
CMS_MOTOR_DATA_SAMPLE_01	motor_job : {0} temp : {0} grind : {0}	Exception Handling
CMS_MOTOR_DATA_SAMPLE_02	motor_job : {1} temp : {0} grind : {0}	Boiling Order Grinding Order Making Order
CMS_MOTOR_DATA_SAMPLE_03	motor_job : {1} temp : {1} grind : {0}	Grinding Order Making Order
CMS_MOTOR_DATA_SAMPLE_04	motor_job : {1} temp : {1} grind : {1}	Making Order
CMS_MOTOR_DATA_SAMPLE_05	motor_job : {2} temp : {1} grind : {1}	Cleaning Order
CMS_MOTOR_DATA_SAMPLE_06	motor_job : {3} temp : {1} grind : {1}	Exception Handling

8.2 Test items

< Table2 Test Design Identification > 참조

8.3 Input specifications

< Table3 Test Case Identification > 참조

8.4 Output specifications

< Table3 Test Case Identification > 참조

9 Testing tasks

< Table4 Testing tasks & Schedule >

Task	Predecessor task	Special skills	Effort	Finish data
Unit Test Plan 작성	SRA 작성 SDS 작성 CMS 구현			2016-10-31
Test Design Specification	Task 1	CMS에 대한 이해		2016-11-01
Test Case Specification	Task 2	CMS에 대한 이해		2016-11-01
Test Execution	Task 3	Test code 작성 Unit test tool 활용		2016-11-03
Test result report	Task 4			2016-11-05

10 Environmental needs

커피 머신 시스템의 Unit Test를 위한 환경적 요구사항은 다음과 같다.

(1) Platform

gcc compiler / linker

(2) Unit test framework

CUnit

(3) Integrated Platform

Cygwin

11 Unit Test deliverables

12 Schedules

< Table4 Testing tasks & Schedule > 참조