TEAM 2

Object Oriented Analysis

강병완 202211248
강현준 202211251
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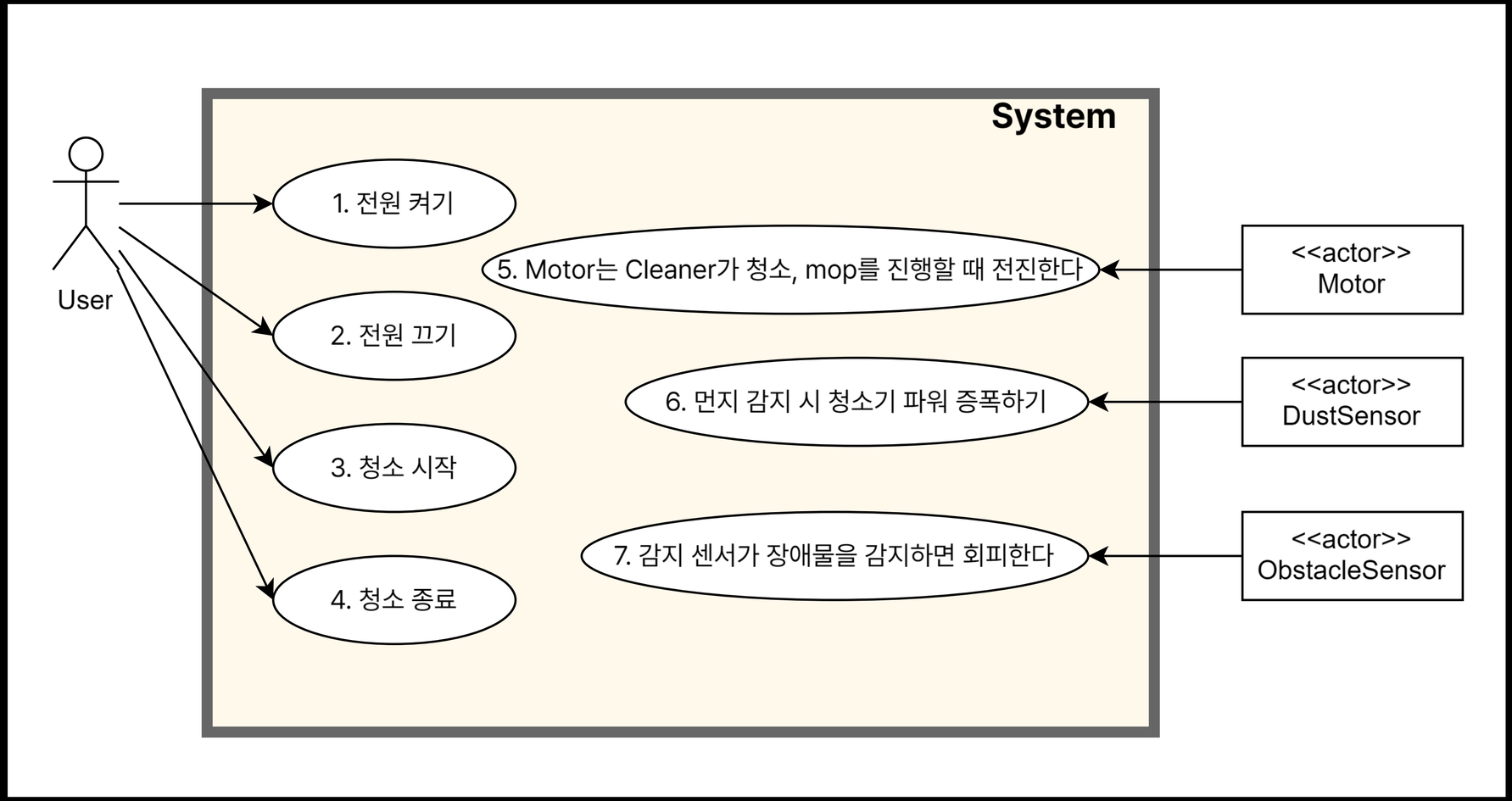
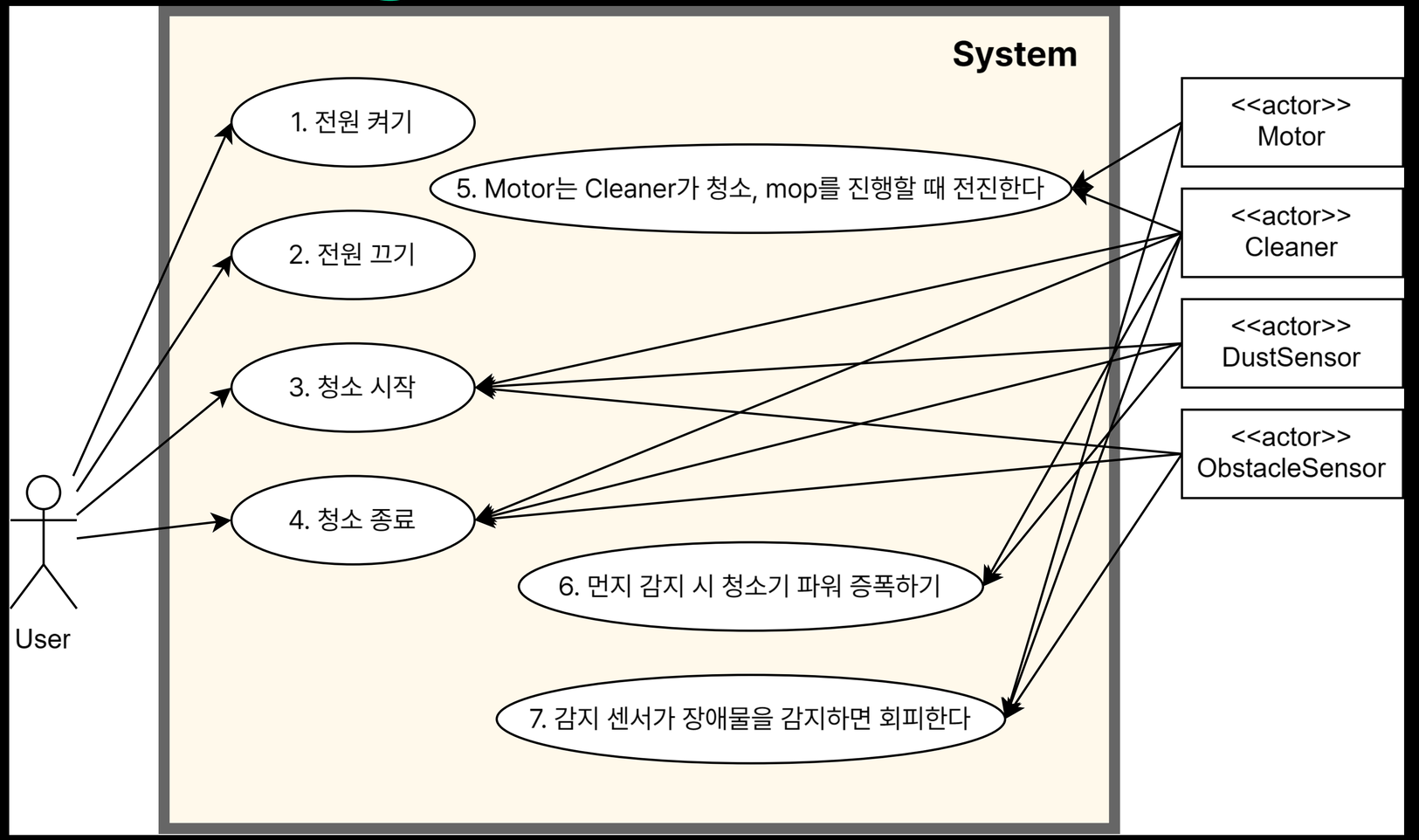
Use case Diagram

Before



UPDATE

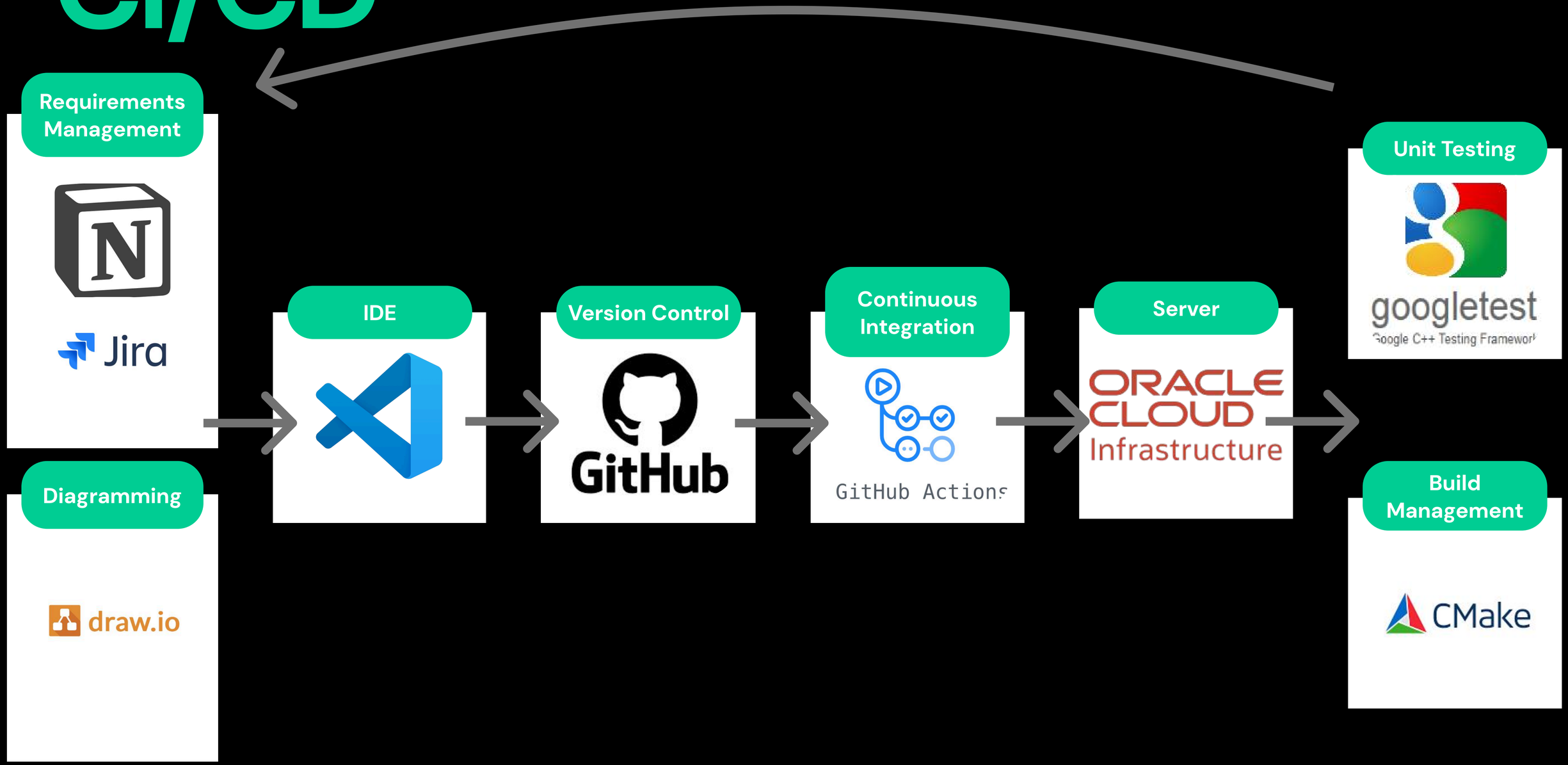
Use case Diagram



Changes #3

CI/CD

Before


Requirements Management
Jira
Diagramming
draw.io
IDE
Version Control
GitHub
Continuous Integration
GitHub Actions
Server
ORACLE CLOUD Infrastructure
Unit Testing
googletest
Google C++ Testing Framework
Build Management
CMake

CI/CD

Development

IDE

Build Management

CMake

Unit Testing

googletest

Google C++ Testing Framework

Version Control

GitHub

Requirements Management

Jira

Team Communication

Server

ORACLE CLOUD Infrastructure

CI

Continuous Integration

GitHub Actions

Build Management

CMake

Unit Testing

googletest

Google C++ Testing Framework

Static Code Analysis

clang-tidy

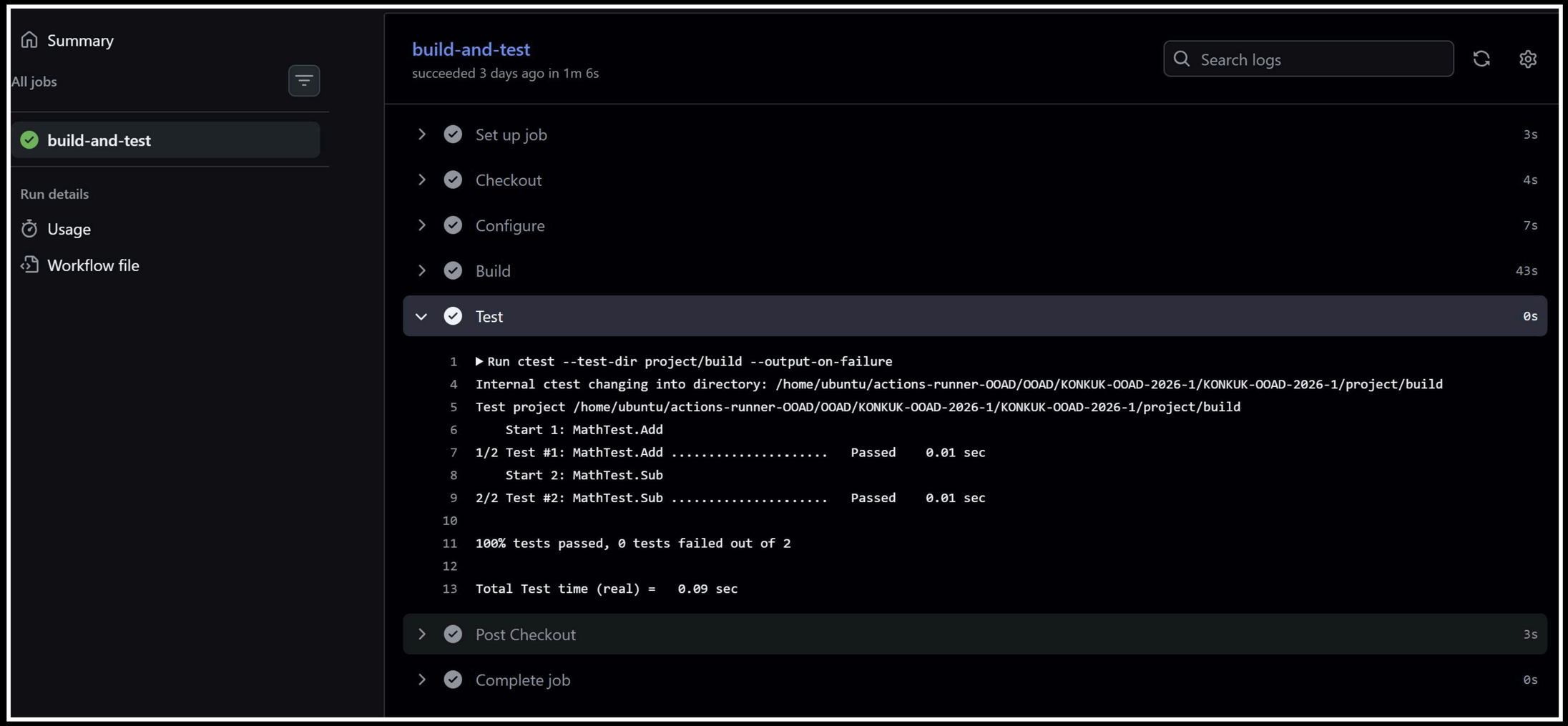
Coverage

gcovr

UPDATE

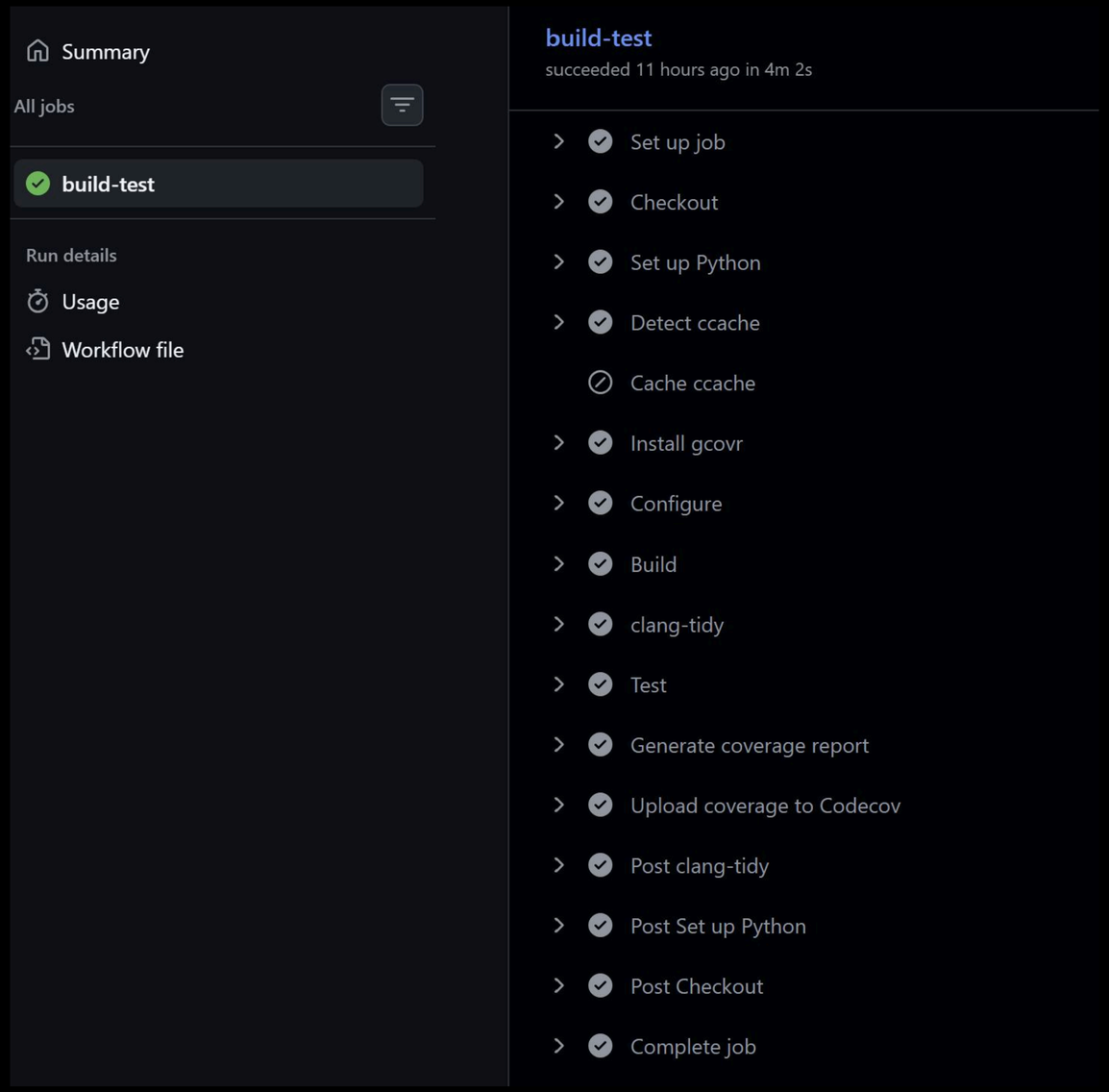
CI/CD

Before


Summary
All jobs
build-and-test
Run details
Usage
Workflow file
build-and-test
succeeded 3 days ago in 1m 6s
Search logs
Set up job 3s
Checkout 4s
Configure 7s
Build 43s
Test 0s
1 ▶ Run ctest --test-dir project/build --output-on-failure
4 Internal ctest changing into directory: /home/ubuntu/actions-runner-OOAD/OOAD/KONKUK-OOAD-2026-1/KONKUK-OOAD-2026-1/project/build
5 Test project /home/ubuntu/actions-runner-OOAD/OOAD/KONKUK-OOAD-2026-1/KONKUK-OOAD-2026-1/project/build
6 Start 1: MathTest.Add
7 1/2 Test #1: MathTest.Add ..... Passed 0.01 sec
8 Start 2: MathTest.Sub
9 2/2 Test #2: MathTest.Sub ..... Passed 0.01 sec
10
11 100% tests passed, 0 tests failed out of 2
12
13 Total Test time (real) = 0.09 sec
Post Checkout 3s
Complete job 0s

CI/CD

UPDATE


Summary
All jobs
build-test
Run details
Usage
Workflow file
build-test
succeeded 11 hours ago in 4m 2s
Set up job
Checkout
Set up Python
Detect ccache
Cache ccache
Install gcovr
Configure
Build
clang-tidy
Test
Generate coverage report
Upload coverage to Codecov
Post clang-tidy
Post Set up Python
Post Checkout
Complete job

Use Case

Before

# Ref. #	Aa Use-Case Name	Actor
1	1. 전원 켜기	User (Primary)
2	2. 전원 끄기	User (Primary)
3	3. 청소 시작	User (Primary) Cleaner(Supporting) DustSensor(Supporting) ObstacleSensor(Supporting)
4	4. 청소 종료	User (Primary) Cleaner(Supporting) DustSensor(Supporting) ObstacleSensor(Supporting)
5	5. Motor는 Cleaner가 켜져 있을 때 전진한다	Motor(Supporting) Cleaner(Supporting)
6	6. 먼지 감지 시 청소기 파워 증폭하기	DustSensor(Supporting) Cleaner(Supporting)
7	7. ObstacleSensor가 장애물을 감지하면 회피한다	ObstacleSensor(Supporting) Motor(Supporting) Cleaner(Supporting)

Update

Use Case

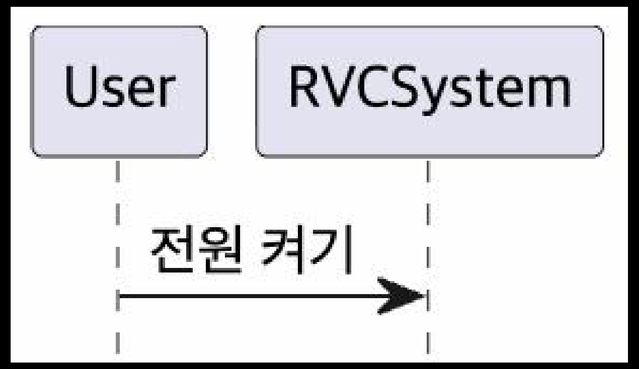
# Ref. #	Aa Use-Case Name	Actor
1	1. 전원 켜기	User (Primary)
2	2. 전원 끄기	User (Primary)
3	3. 청소 시작	User (Primary) Cleaner(Supporting) DustSensor(Supporting) ObstacleSensor(Supporting)
4	4. 청소 종료	User (Primary) Cleaner(Supporting) DustSensor(Supporting) ObstacleSensor(Supporting)
5	5. 청소 시 전진	Motor(Supporting) Cleaner(Supporting)
6	6. 청소 파워 증폭	DustSensor(Supporting) Cleaner(Supporting)
7	7. 장애물 감지 후 회피	ObstacleSensor(Supporting) Motor(Supporting) Cleaner(Supporting)

Use Case #1

Name	1. 전원 켜기
Actor	User (Primary)
Pre-Requisites	RVC의 전원이 꺼져있는 상태이다.
Typical Courses of Events	(R) : RVCSystem, (U) : User 1. (U)가 (R)의 전원을 켠다. 2. (R)의 전원이 켜진다.
Alternative Courses of Events	N/A
Exceptional Courses of Events	N/A

Use Case #1

Before



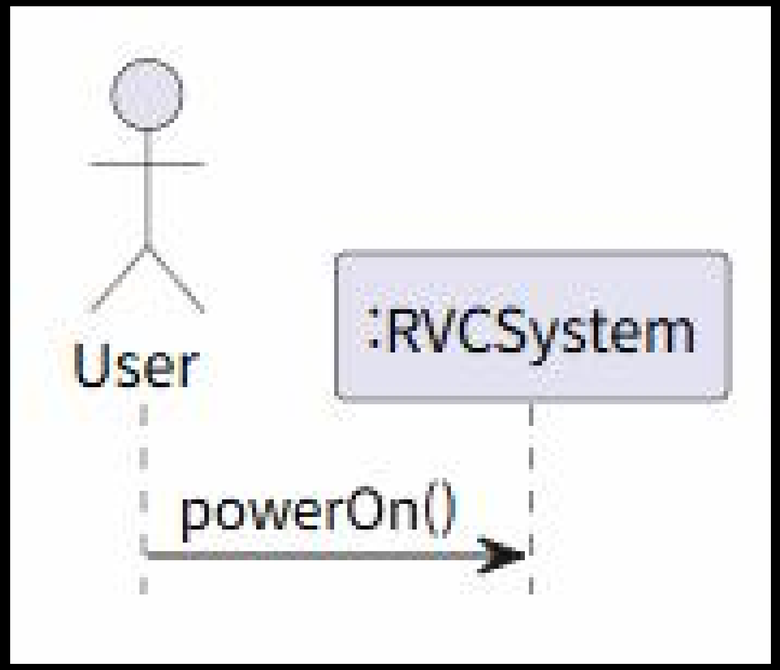
+ 전원 켜기

System Sequence Diagram

System Operations

Use Case #1

Update



+ powerOn()

System Sequence Diagram

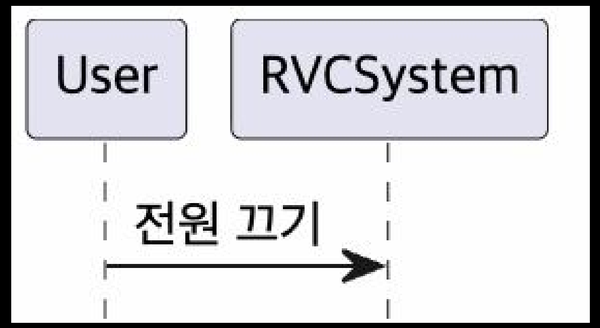
System Operations

Use Case #2

Name	2. 전원 끄기
Actor	User (Primary)
Pre-Requisites	RVC의 전원이 켜져 있음.
Typical Courses of Events	(R) : RVCSystem, (U) : User 1. (U)가 (R)의 전원을 끈다. 2. (R)의 전원이 꺼진다.
Alternative Courses of Events	N/A
Exceptional Courses of Events	N/A

Use Case #2

Before



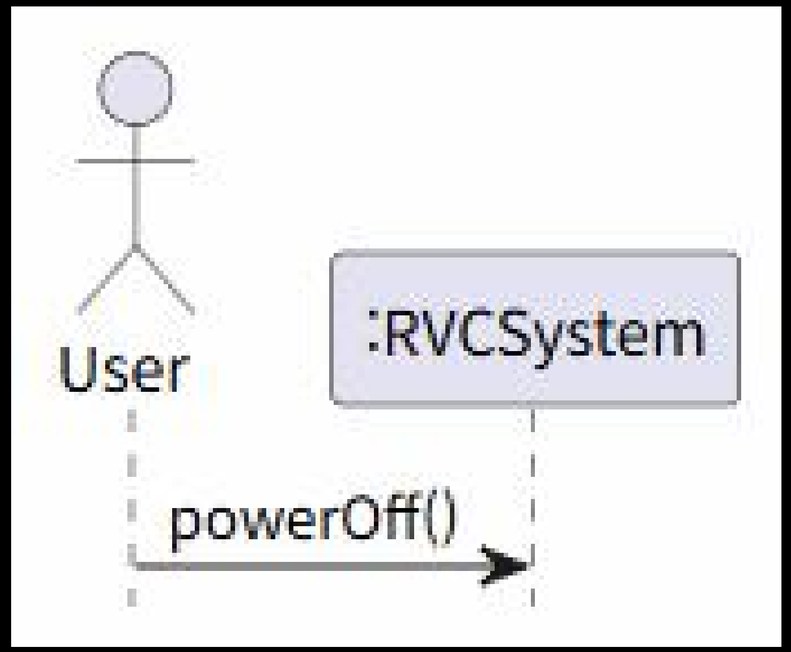
+ 전원 끄기

System Sequence Diagram

System Operations

Use Case #2

Update



System Sequence Diagram

+ powerOff()

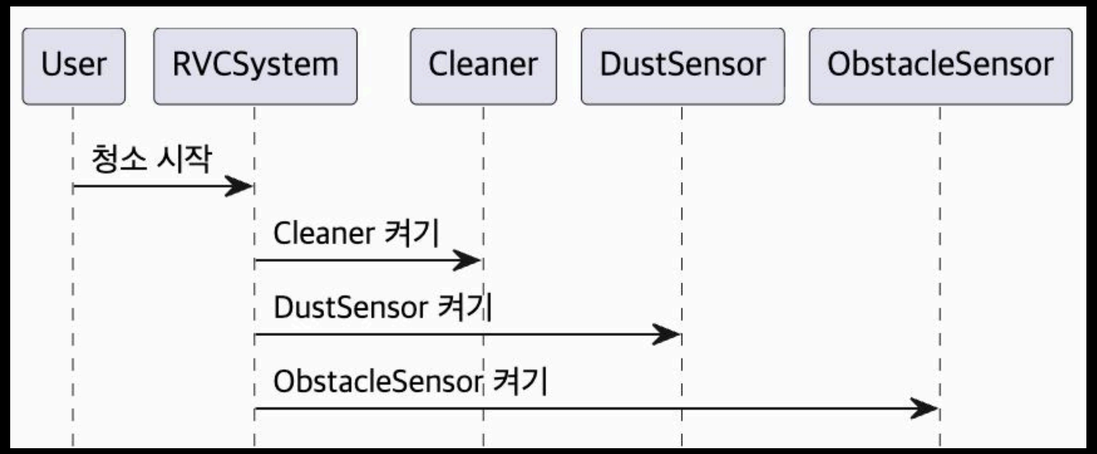
System Operations

Use Case #3

Name	3. 청소 시작
Actor	User(Primary), Cleaner(Supporting), ObstacleSensor(Supporting), DustSensor(Supporting)
Pre-Requisites	RVC의 전원이 켜져있다.
Typical Courses of Events	(R) : RVCSystem, (U) : User, (C) : Cleaner, (O) : ObstacleSensor, (D) : DustSensor 1. (U)이 (R)에게 청소시작을 지시 한다. 2. (R)이 (C)를 킨다. 3. (R)이 (D)의 전원을 킨다. 4. (R)이 (O)의 전원을 킨다.
Alternative Courses of Events	N/A
Exceptional Courses of Events	N/A

Use Case #3

Before



System Sequence Diagram

+ 청소 시작

+ Cleaner 켜기

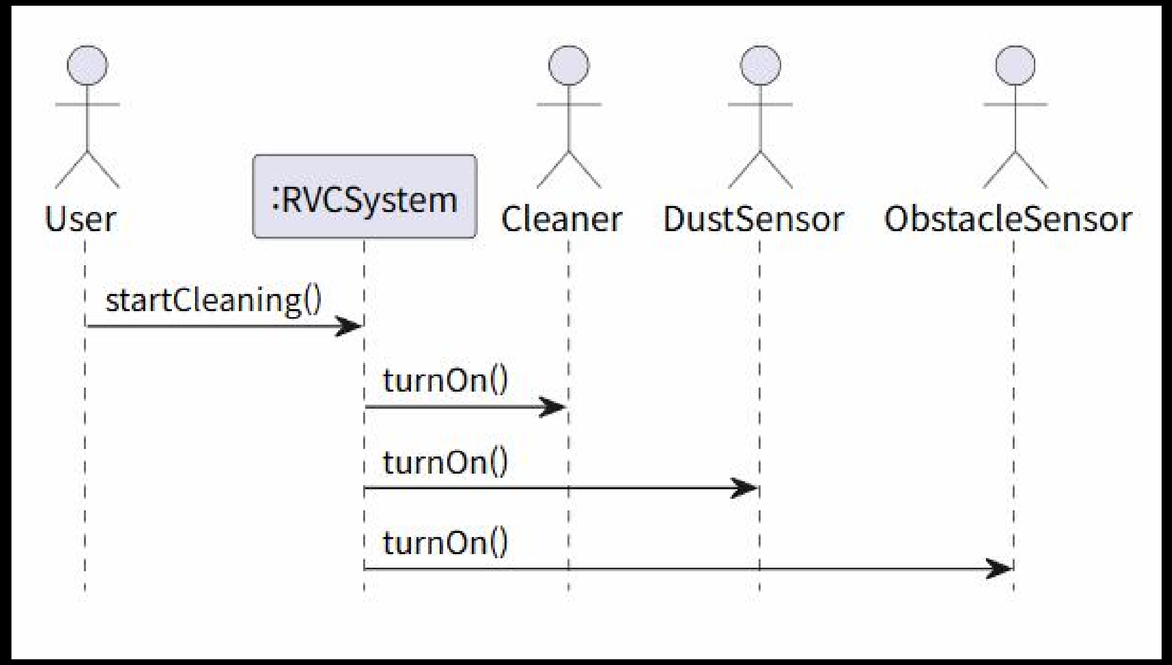
+ DustSensor 켜기

+ ObstacleSensor 켜기

System Operations

Use Case #3

Update



+ startCleaning()

+ turnOn()

System Sequence Diagram

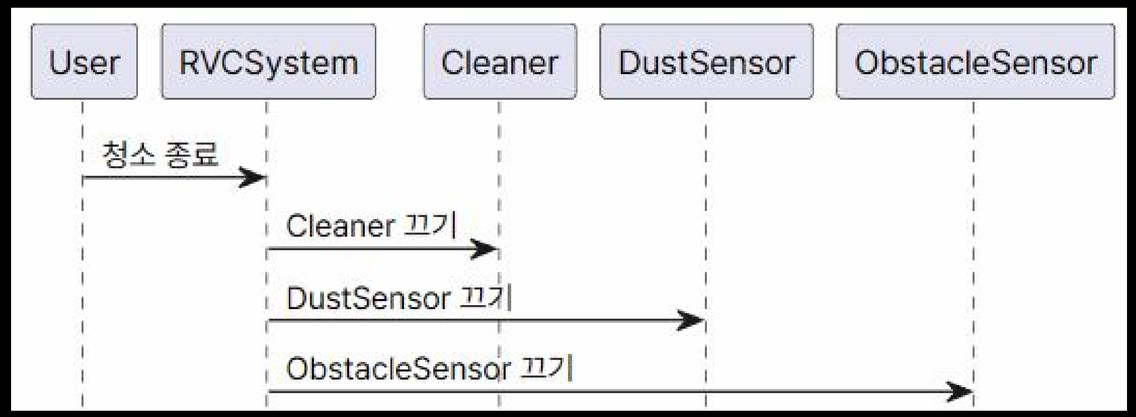
System Operations

Use Case #4

Name	4. 청소 종료
Actor	User(Primary), Cleaner(Supporting), ObstacleSensor(Supporting), DustSensor(Supporting)
Pre-Requisites	RVC가 청소를 진행 중이다.
Typical Courses of Events	(R): RVCSystem, (U): User, (C): Cleaner, (O): ObstacleSensor, (D): DustSensor 1. (U)가 (R)의 청소를 종료하게 지시한다. 2. (R)이 (C)를 끈다. 3. (R)이 (D)를 끈다. 4. (R)이 (O)를 끈다.
Alternative Courses of Events	N/A
Exceptional Courses of Events	N/A

Use Case #4

Before



+ 청소 종료

+ Cleaner 끄기

+ DustSensor 끄기

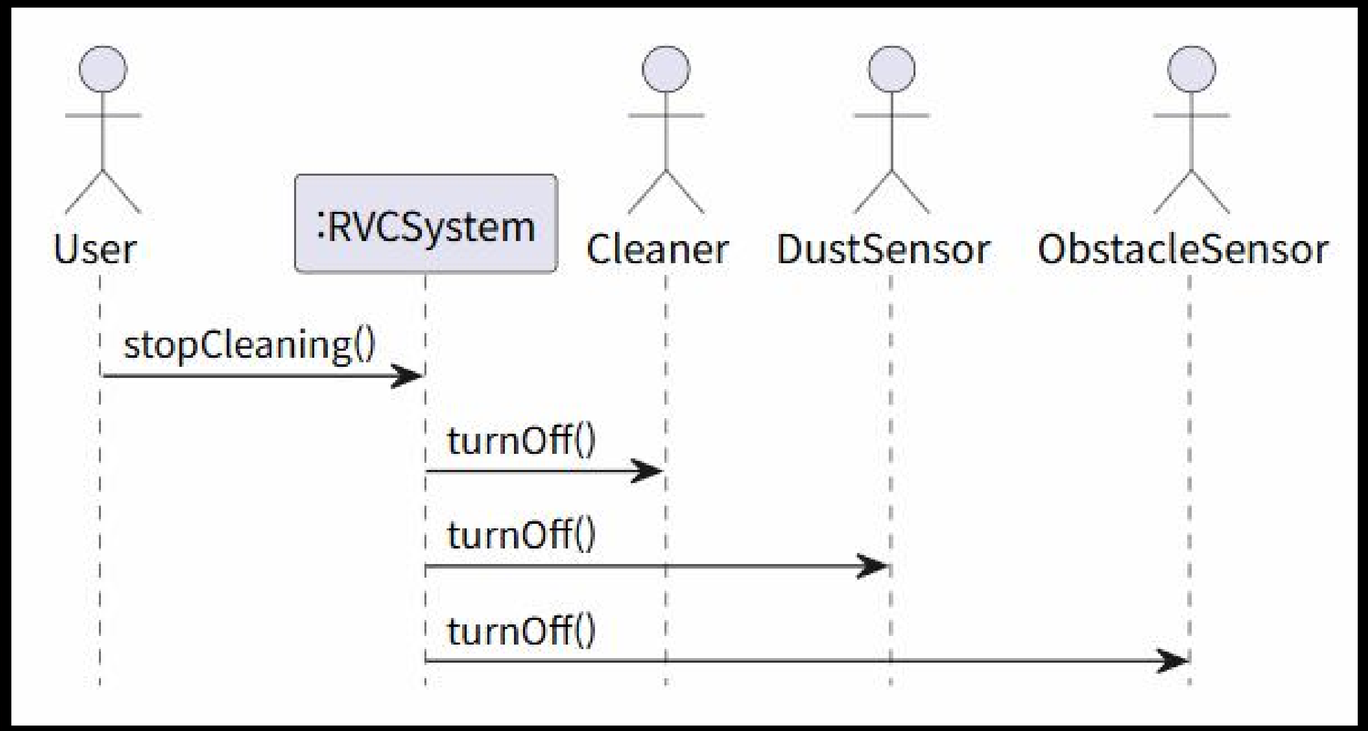
+ ObstacleSensor 끄기

System Sequence Diagram

System Operations

Use Case #4

Update



+ stopCleaning()

+ turnOff()

System Sequence Diagram

System Operations

Use Case #5

Before

Name	5. Motor는 Cleaner가 켜져 있을 때 전진한다.
Actor	Motor(Supporting), Cleaner(Supporting)
Pre-Requisites	RVC가 켜진 상태이다.
Typical Courses of Events	(C) : Cleaner, (M) : Motor, (R) : RVCSystem 1. (C)가 (R)에게 신호를 보낸다. 2. (R)은 (M)이 전진하도록 한다.
Alternative Courses of Events	N/A
Exceptional Courses of Events	N/A

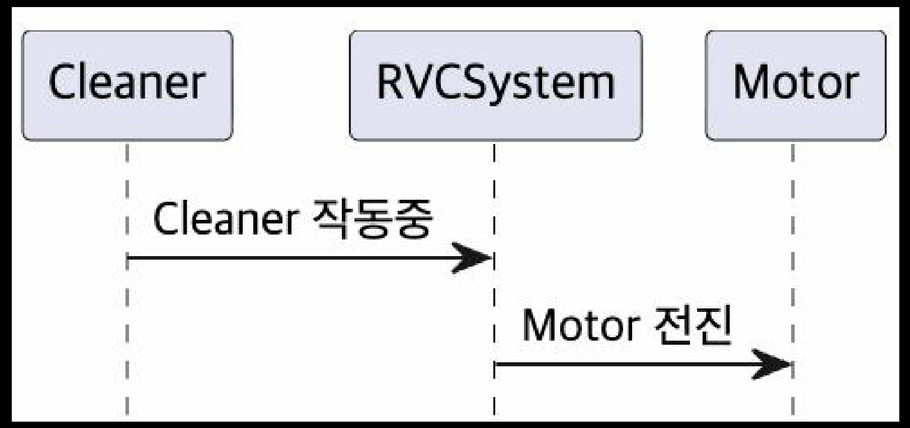
Use Case #5

Update

Name	5. 청소 시 전진
Actor	Motor(Supporting), Cleaner(Supporting)
Pre-Requisites	RVC가 켜진 상태이다.
Typical Courses of Events	(C) : Cleaner, (M) : Motor, (R) : RVCSystem 1. (R)이 (C)에게 켜져있냐고 물어본다. 2. (C)가 켜져있는 걸 (R)이 인식하면, (R)은 (M)을 전진하도록 한다.
Alternative Courses of Events	N/A
Exceptional Courses of Events	N/A

Use Case #5

Before



+ Cleaner 작동중

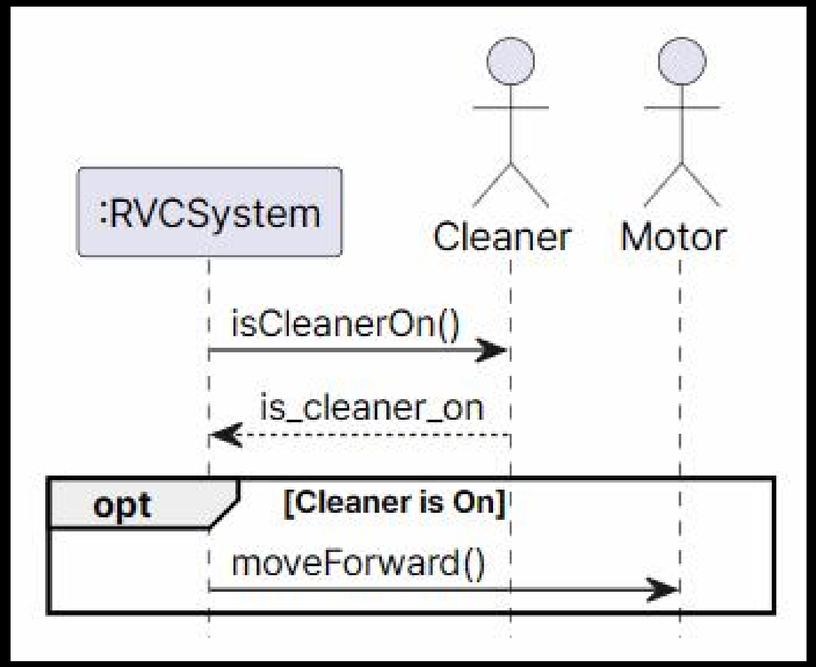
+ Motor 전진

System Sequence Diagram

System Operations

Use Case #5

Update



System Sequence Diagram

+ isCleanerOn()

+ moveForward()

System Operations

Use Case #6

Before

Name	6. 먼지 감지 시 청소기 파워 증폭하기
Actor	DustSensor(Supporting), Cleaner(Supporting)
Pre-Requisites	RVC가 청소 중이다.
Typical Courses of Events	(R): RVCSystem, (D): DustSensor, (C):Cleaner 1. (D)가 (R)에게 신호를 보낸다. 2. 먼지가 감지되었다면 (R)이 (C)의 파워를 증폭모드로 설정한다.
Alternative Courses of Events	Line 2: 먼지가 감지되지 않았다면 (R)이 (C)의 파워를 기본 모드로 설정한다.
Exceptional Courses of Events	N/A

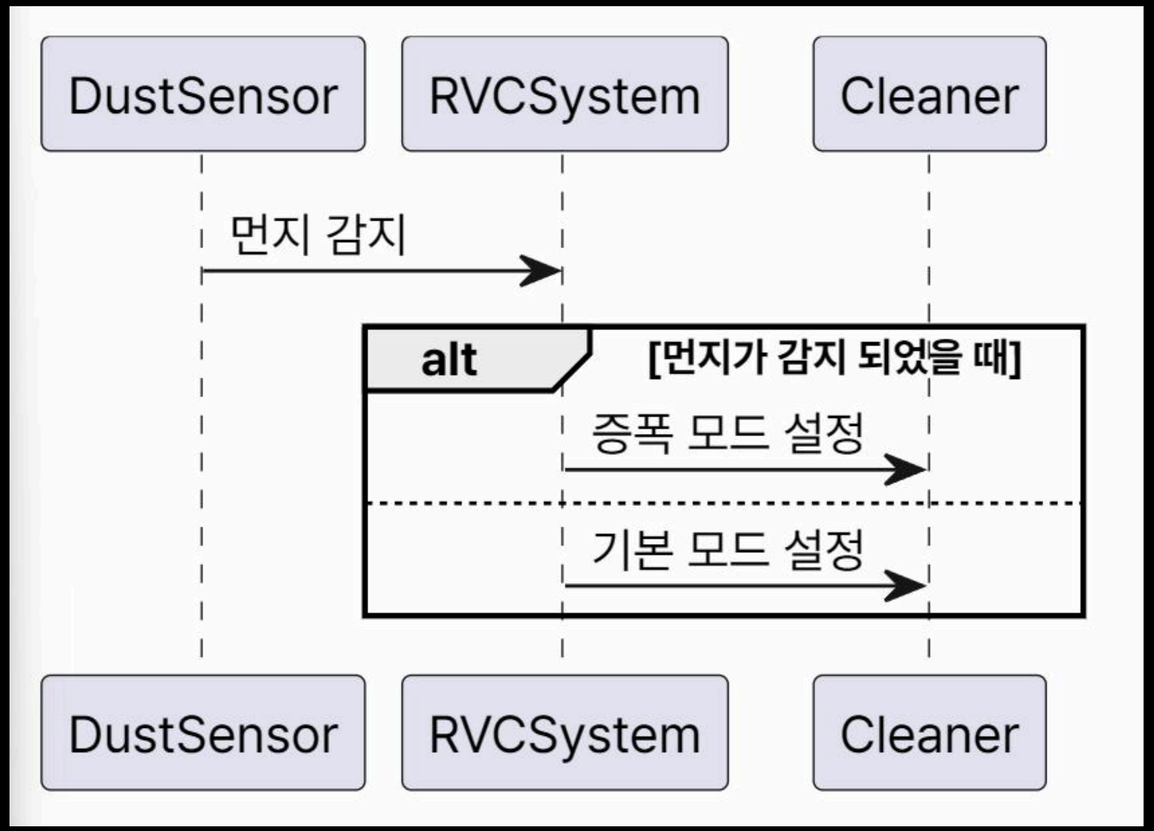
Use Case #6

Update

Name	6. 청소 파워 증폭
Actor	DustSensor(Supporting), Cleaner(Supporting)
Pre-Requisites	RVC가 청소 중이고, Cleaner가 켜져있다.
Typical Courses of Events	(R): RVCSystem, (D): DustSensor, (C):Cleaner 1. (R)이 (D)에게 먼지 감지를 요청한다. 2. 먼지가 감지되었다면 (R)이 (C)의 파워를 증폭모드로 설정한다.
Alternative Courses of Events	Line 2: 먼지가 감지되지 않았다면 (R)이 (C)의 파워를 기본 모드로 설정한다.
Exceptional Courses of Events	N/A

Use Case #6

Before



+ 먼지 감지

+ 증폭 모드

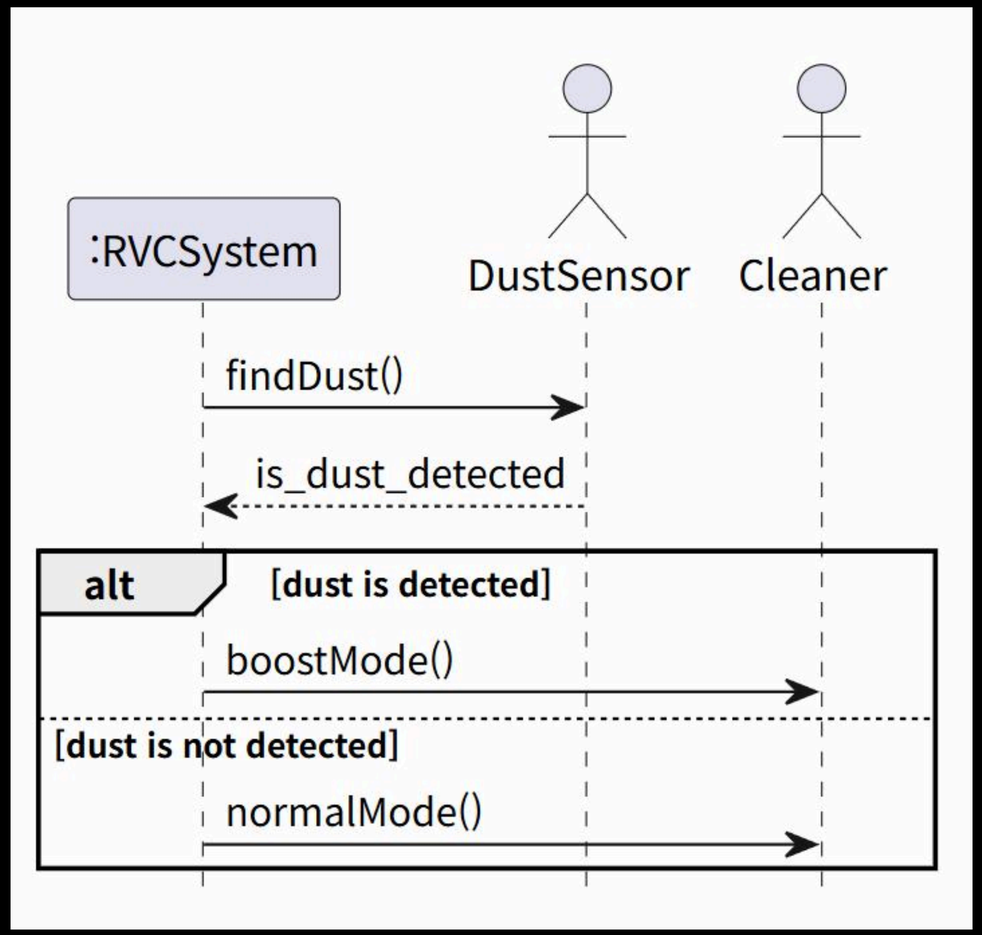
+ 기본 모드

System Sequence Diagram

System Operations

Use Case #6

Update



System Sequence Diagram

+ findDust()

+ boostMode()

+ normalMode()

System Operations

Use Case #7

Before

Name	7. ObstacleSensor가 장애물을 감지하면 회피한다
Actor	ObstacleSensor(Supporting), Cleaner(Supporting), Motor(Motor)
Pre-Requisites	RVC가 청소 중이다.
Typical Courses of Events	(C) : Cleaner (M): Motor, (O): ObstacleSensor, (R) : RVCSystem 1. (O)가 장애물을 감지해 (R)에게 알린다. 2. (R)이 (C)를 끈다. 3. (R)이 (M)의 이동을 중단하도록 한다. 4. 좌측 또는 우측에 장애물이 없다면, (R)은 (M)이 장애물이 없는 방향으로 회전하도록 한다. 5. (R)이 (C)를 켠다.
Alternative Courses of Events	Line 4: 좌우측에 장애물이 있다면, (R)은 (M)이 후진 후에 좌측 또는 우측으로 회전하도록 한다.
Exceptional Courses of Events	Line 4~5: 사방에 장애물이 있다면, (O)를 끄고 청소를 종료한다.

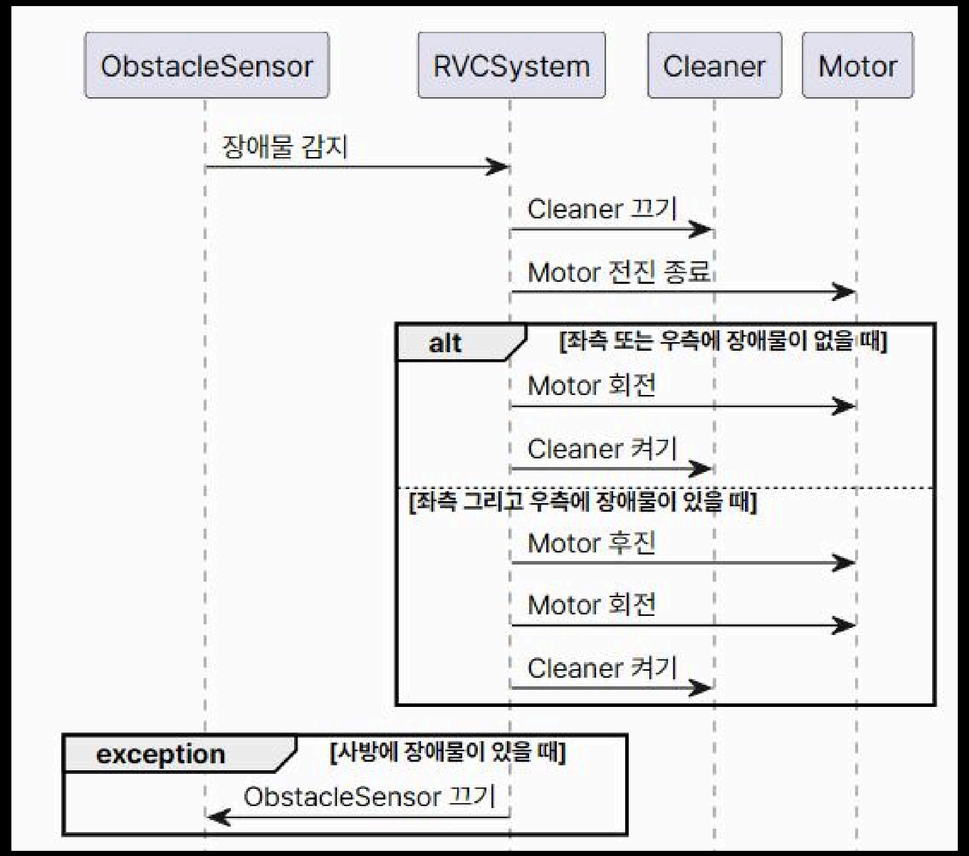
Use Case #7

Update

Name	7. 장애물 감지 후 회피
Actor	ObstacleSensor(Supporting), Cleaner(Supporting), Motor(Motor)
Pre-Requisites	RVC가 청소 중이다.
Typical Courses of Events	(C) : Cleaner (M): Motor, (O): ObstacleSensor, (R) : RVCSystem 1. (R)이 (O)에게 장애물 감지를 요청한다. 2. 정면에서 장애물을 감지했다면, (R)이 (C)를 끈다. 3. (R)이 (M)의 이동을 중단한다. 4. 좌측에 장애물이 없다면, (R)은 (M)이 좌측으로 회전하도록 한다. 5. (R)이 (C)를 켠다.
Alternative Courses of Events	Line 4 : 좌측에 장애물이 있고 우측에 장애물이 없다면 (R)은 (M)이 우측으로 회전하도록 한다. Line 4: 좌측 그리고 우측에 장애물이 있다면, (R)은 (M)이 후진 후에 좌측 또는 우측으로 회전하도록 한다.
Exceptional Courses of Events	Line 4~5 : 사방에 장애물이 있다면, 청소를 종료한다.

Use Case #7

Before



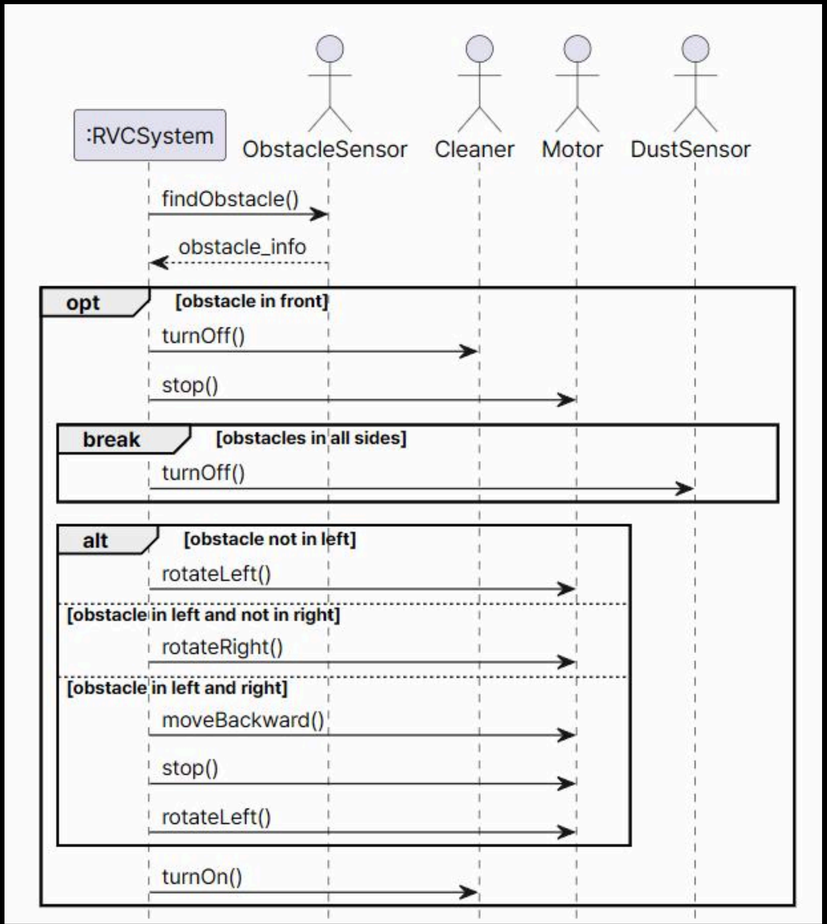
System Sequence Diagram

+ 장애물 감지
+ Cleaner 켜기
+ Cleaner 끄기
+ Motor 전진 종료
+ Motor 회전
+ Motor 후진
+ ObstacleSensor 끄기

System Operations

Use Case #7

Update



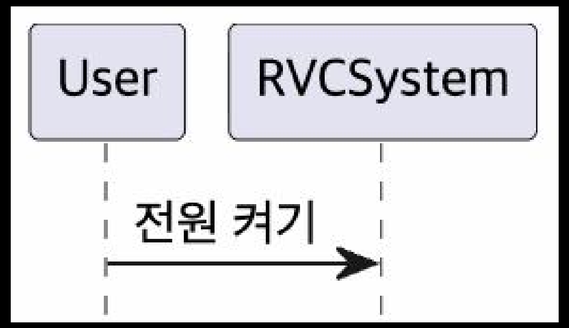
System Sequence Diagram

+ findObstacle()
+ turnOff()
+ stop()
+ rotateLeft()
+ rotateRight()
+ moveBackward()
+ turnOn()

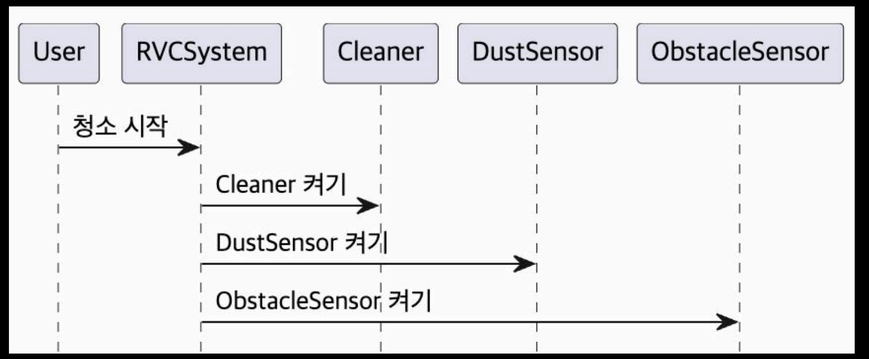
System Operations

Before

System Sequence Diagram



UC #1



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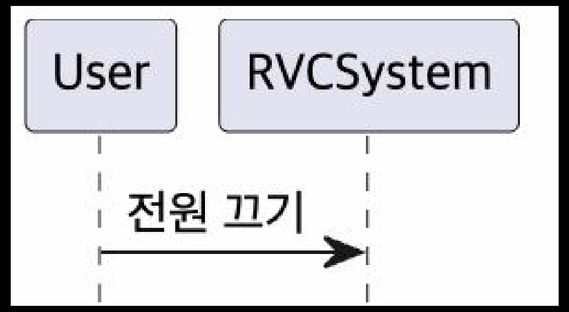
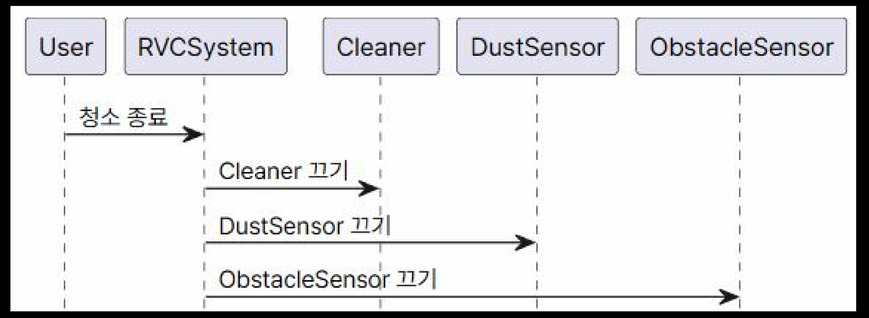


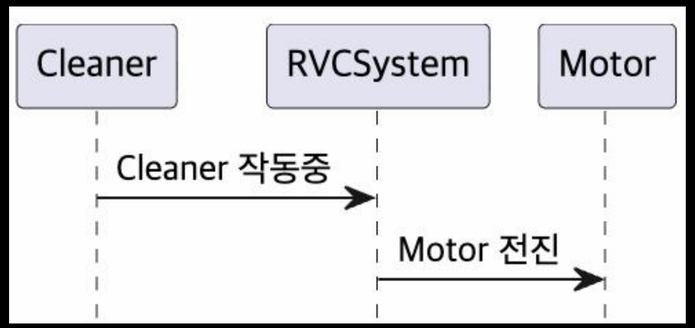
UC #2



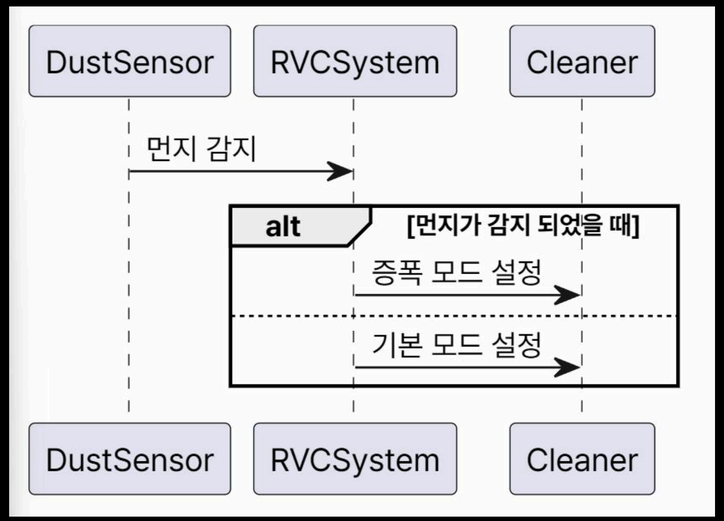
UC #4

Before

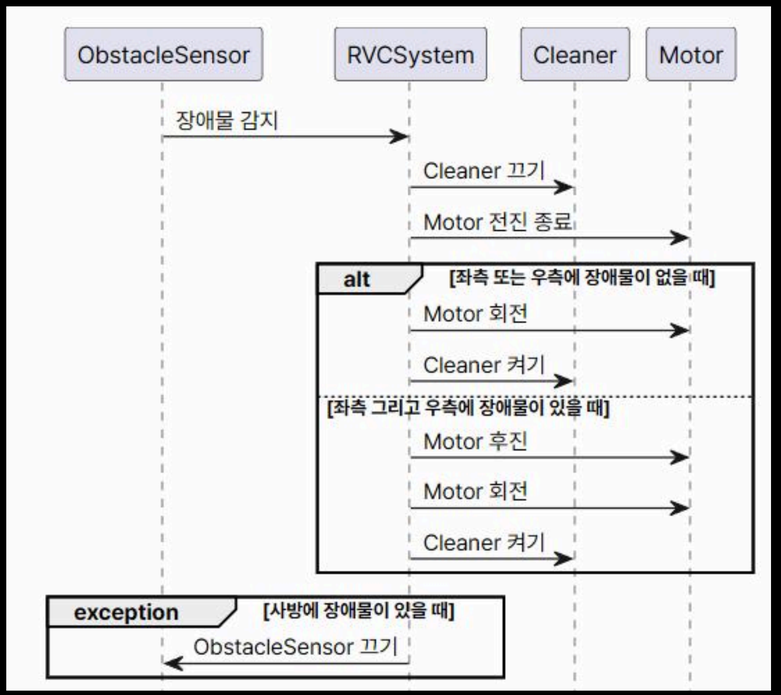
System Sequence Diagram



UC #5



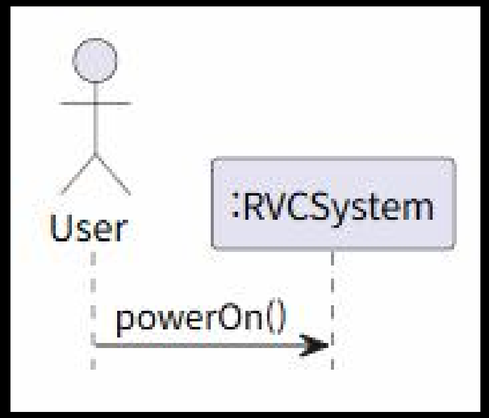
UC #6



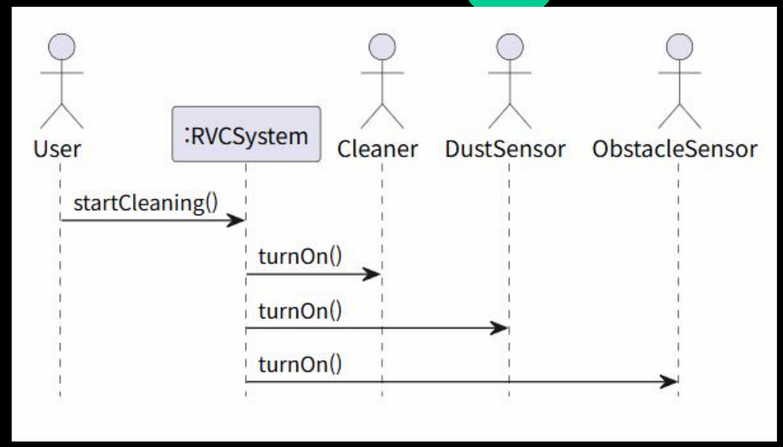
UC #7

System Sequence Diagram

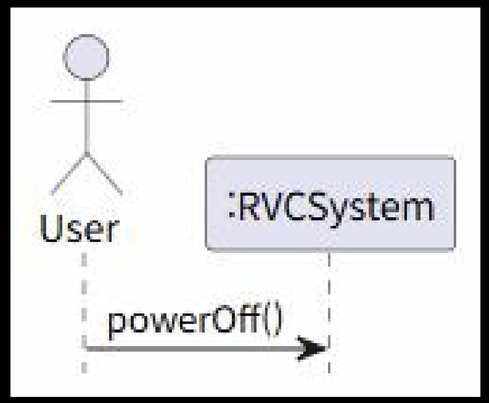
Update



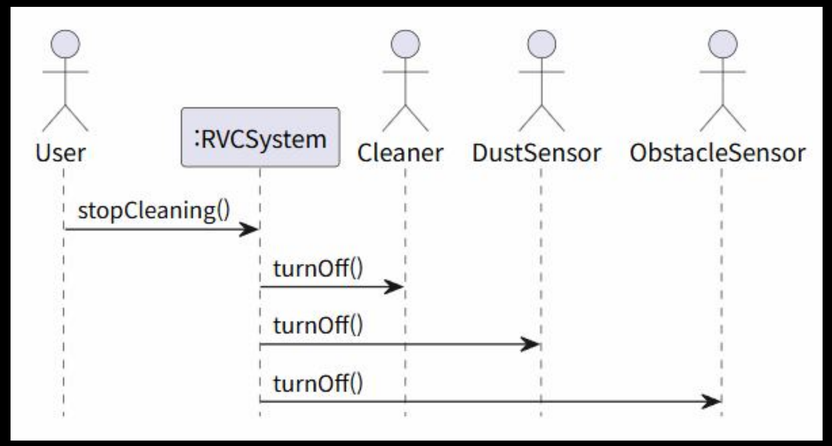
UC #1



UC #3



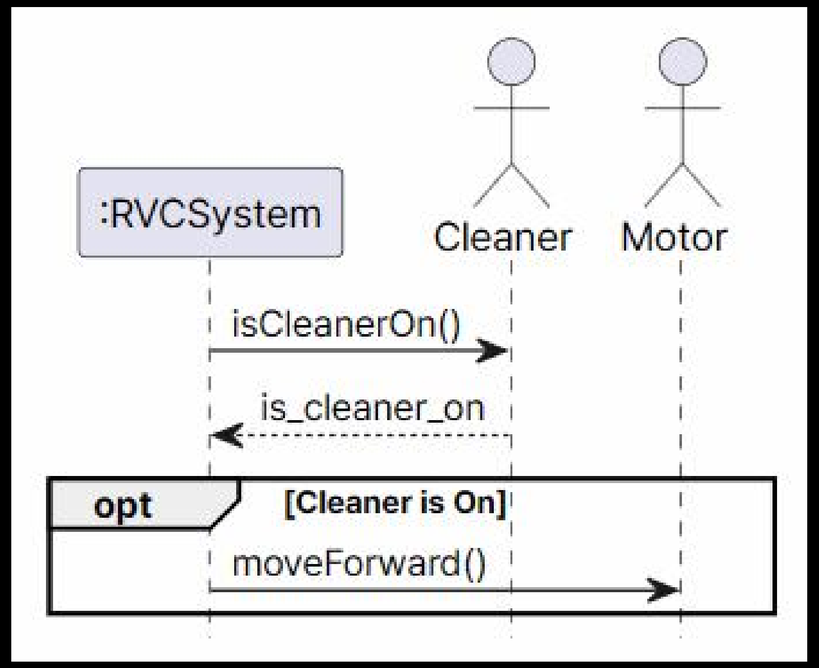
UC #2



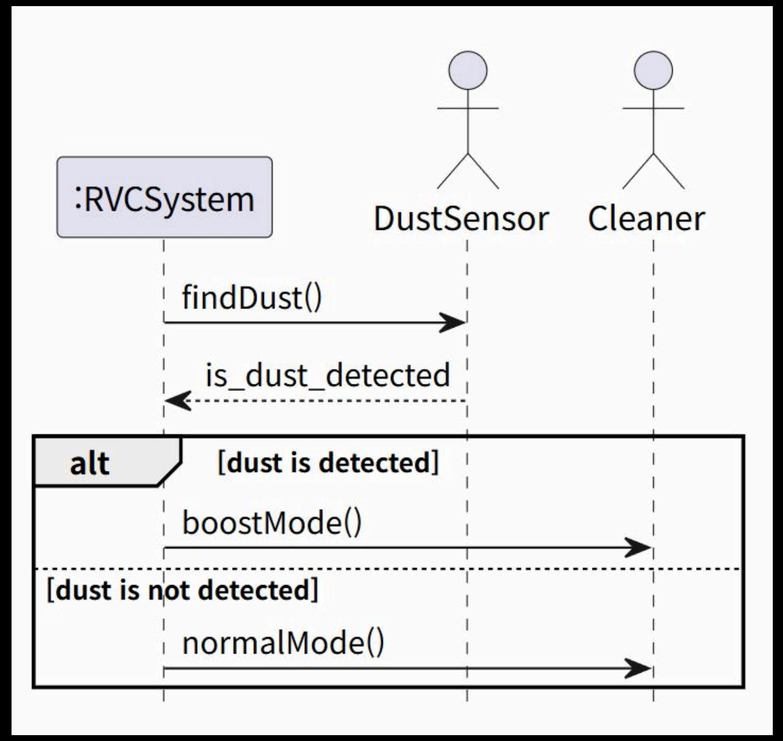
UC #4

System Sequence Diagram

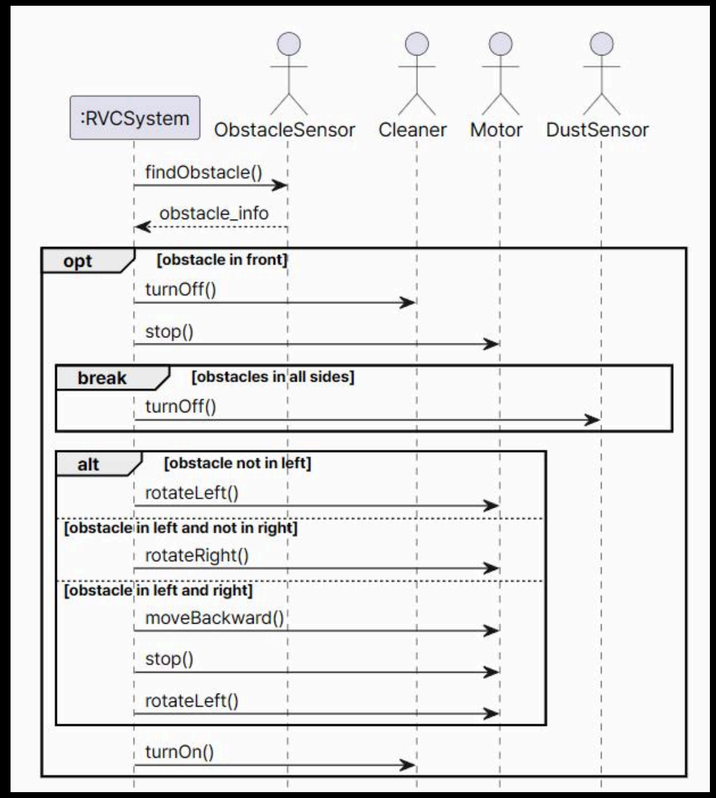
Update



UC #5



UC #6



UC #7

System Operations

Before

+ 전원 켜기
+ 전원 끄기

+ 청소 시작
+ Cleaner 켜기
+ DustSensor 켜기
+ ObstacleSensor 켜기

+ 청소 종료
+ Cleaner 끄기
+ DustSensor 끄기
+ ObstacleSensor 끄기

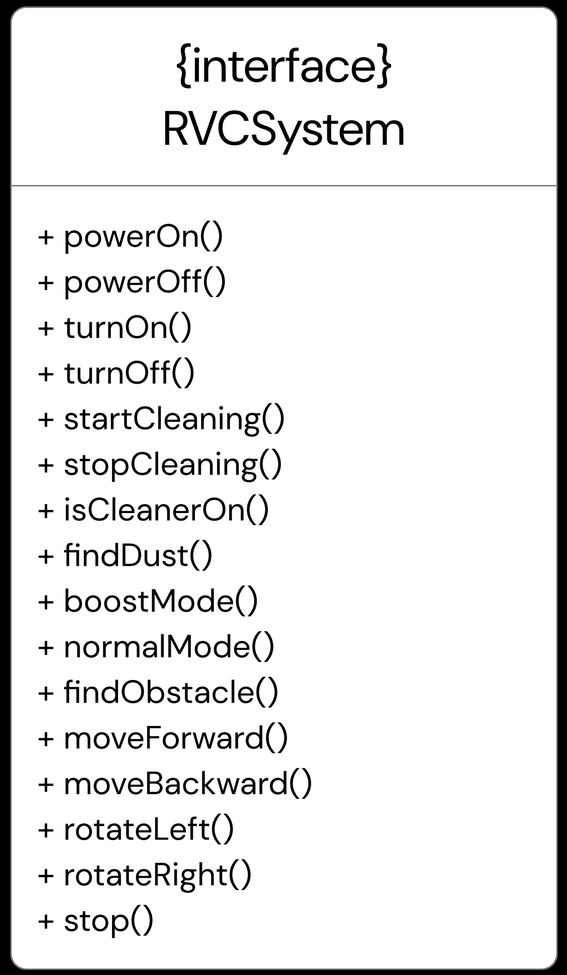
+ Cleaner 작동중
+ 전진

+ 먼지 감지
+ 증폭 모드
+ 기본 모드

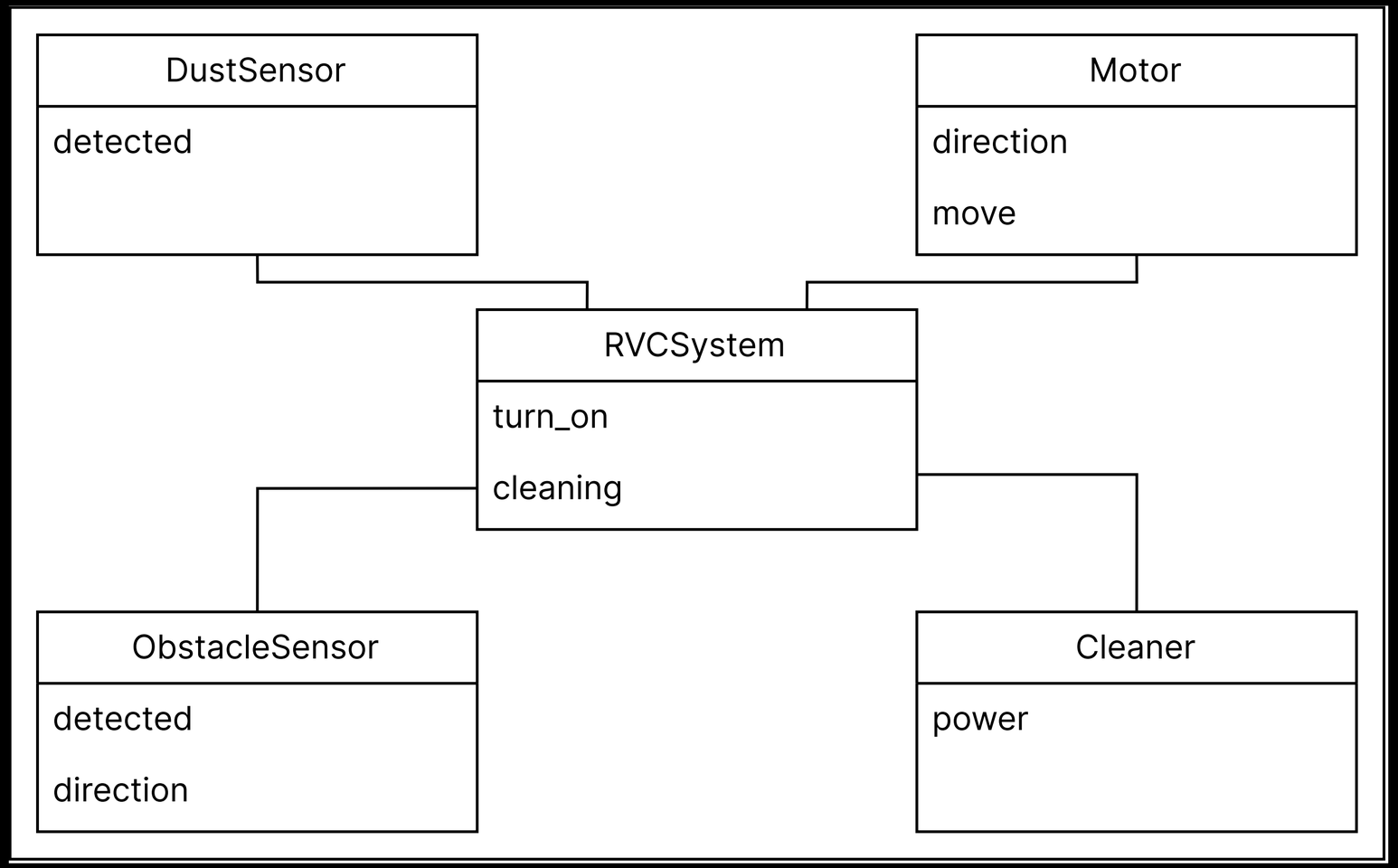
+ 장애물 감지
+ Cleaner 켜기
+ Cleaner 끄기
+ Motor 전진 종료
+ Motor 회전
+ Motor 후진
+ ObstacleSensor 끄기

System Operations

Update



Domain Model



Thank you!