

MIDTERM PRESENTATION (OCT 25TH FRI)

CAPSTONE DESIGN PROJECT 2024 FALL

# HOUSIT

## HOUSECARE MOBILE APP

WE ARE TEAM A+

• MINSOO KIM | SEOYOUNG JO | SEOYOUNG JIN | JINWOOK CHOI | SOOYOUNG HWANG

# TODAY,

Team A+ | HOUSIT | Midterm presentation (Oct 25th Fri)

# 1

## PLAN & ROLE

- 01-01 Objectives & Milestones
- 01-02 Role of each member

# 2

## DESIGN & UI/UX

# 3

## IMPLEMENTATION & CHALLENGES (TRIAL & ERROR)

- 03-01 Frontend
- 03-02 Backend
- 03-03 OCR feature

# 4-

## THINGS TO IMPLEMENT

- 04-01 Design
- 04-02 Frontend
- 04-03 Backend
- 04-04 OCR feature

# 1

# PLAN & ROLE

# OBJECTIVES & MILESTONES

DESIGN   FRONTEND					Action Plan										BACKEND   OCR SCAN FEATURE				
2024		Capstone Design Project			Team : A plus		김민수   조서영   전서영   최진욱   황수영					Topic : House Care Mobile App							
Activities	Week1 (9월 6일)	Week2 (9월 13일)	Week3 (9월 20일)	Week4 (9월 27일)	Week5 (10월 4일)	Week6 (10월 11일)	Week7 (10월 18일)	Week8 (10월 25일)	Week9 (11월 1일)	Week10 (11월 8일)	Week11 (11월 15일)	Week12 (11월 22일)	Week13 (11월 29일)	Week14 (12월 6일)	Week15 (12월 13일)				
details		Team Building	Idea PT	online class	Proposal Presentation	Weekly Progress O	Weekly Progress X	Midterm 1	Midterm 2	Weekly Progress O	Weekly Progress X	Weekly Progress O	Weekly Progress X	Final Demo 1	Final Demo 2				
Specifying/Clarifying features																			
API Documentation																			
Design UI/UX																			
Designing App																			
Backend																			
Frontend																			
OCR feature implementation																			
Weekly Progress																			
Midterm Presentation									Midterm Presentation										
Final Demo 1														Final Demo					

# ROLE OF EACH MEMBERS

Capstone Design Project 2024 Fall

TEAM A+

**MINSOO KIM** PROJECT MANAGING, PRESENTATION

**SEOYOUNG JO** OCR FEATURE IMPLEMENTATION

**SEOYOUNG JIN** DESIGN, UI/UX

**JINWOOK CHOI** FRONTEND

**SOOYOUNG HWANG** BACKEND, DESIGNING DB/ERD(ENTITY RELATIONSHIP DIAGRAM)

2

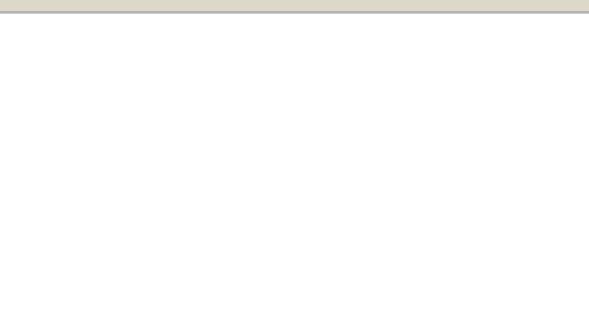
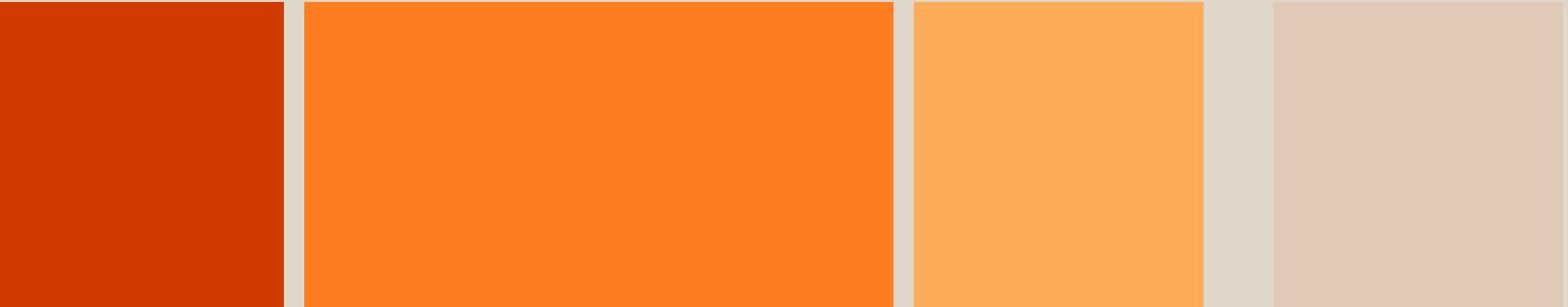
# DESIGN & UI/UX

# DESIGN & UI/UX

LOGO



COLOR



HOUSIT  
HOUSIT

## TYPOGRAPHY

카이밍

### Typography

Description

#### Title

Level	Weight	Font Size	Line Height	Description
-------	--------	-----------	-------------	-------------

#### Display

Bold	60px	72px	label
------	------	------	-------

#### H1

Bold	48px	60px	label
------	------	------	-------

#### H2

Bold	36px	45px	label
------	------	------	-------

#### H3

Bold	24px	36px	label
------	------	------	-------

#### H4

Bold	21px	31.5px	label
------	------	--------	-------

#### Body

Level	Weight	Font Size	Line Height	Description
-------	--------	-----------	-------------	-------------

B	Bold	16px	28px	label
---	------	------	------	-------

Body	Medium	16px	28px	label
------	--------	------	------	-------

Label	Bold	14px	24.5px	label
-------	------	------	--------	-------

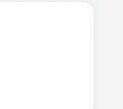
Label	Medium	14px	20px	label
-------	--------	------	------	-------

Label	Medium	12px	16px	label
-------	--------	------	------	-------

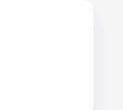
## SHADOW

### Elevation

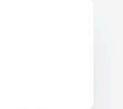
Shadow/S



Shadow/M

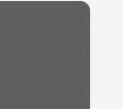


Shadow/L

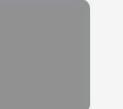


### Dimmer

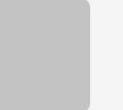
Dimmer/3



Dimmer/2

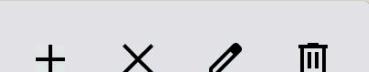
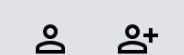


Dimmer/1



# DESIGN : UI/UX

## ICON



## HEADER

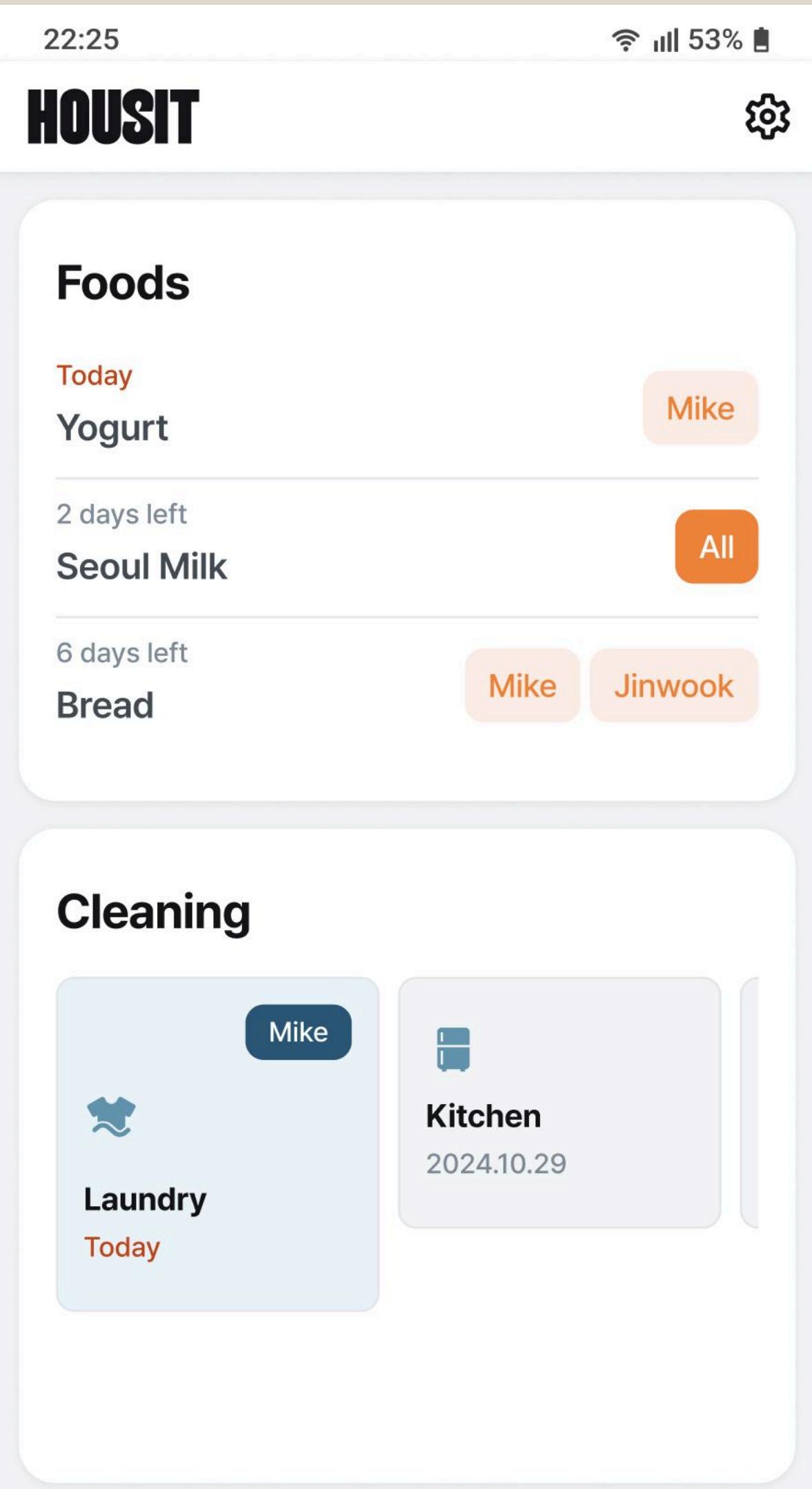
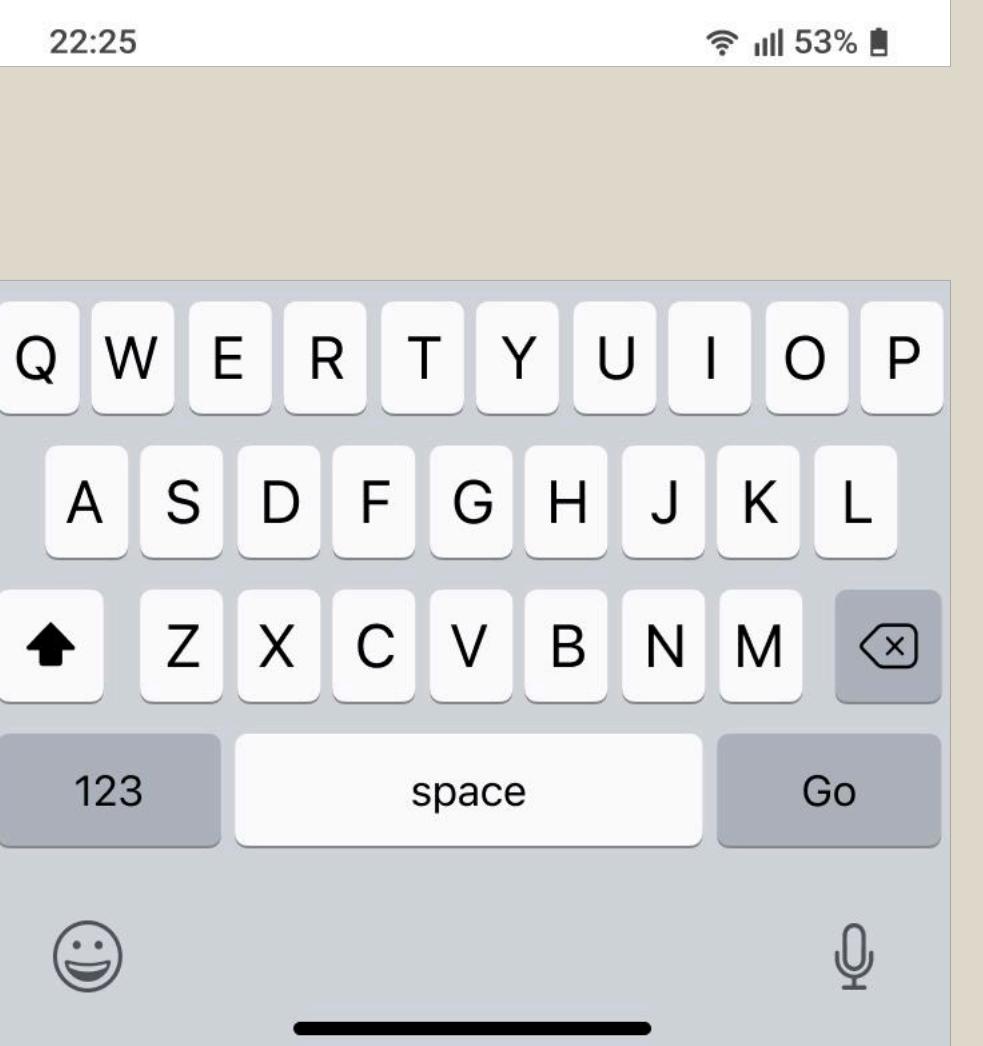
HOUSIT



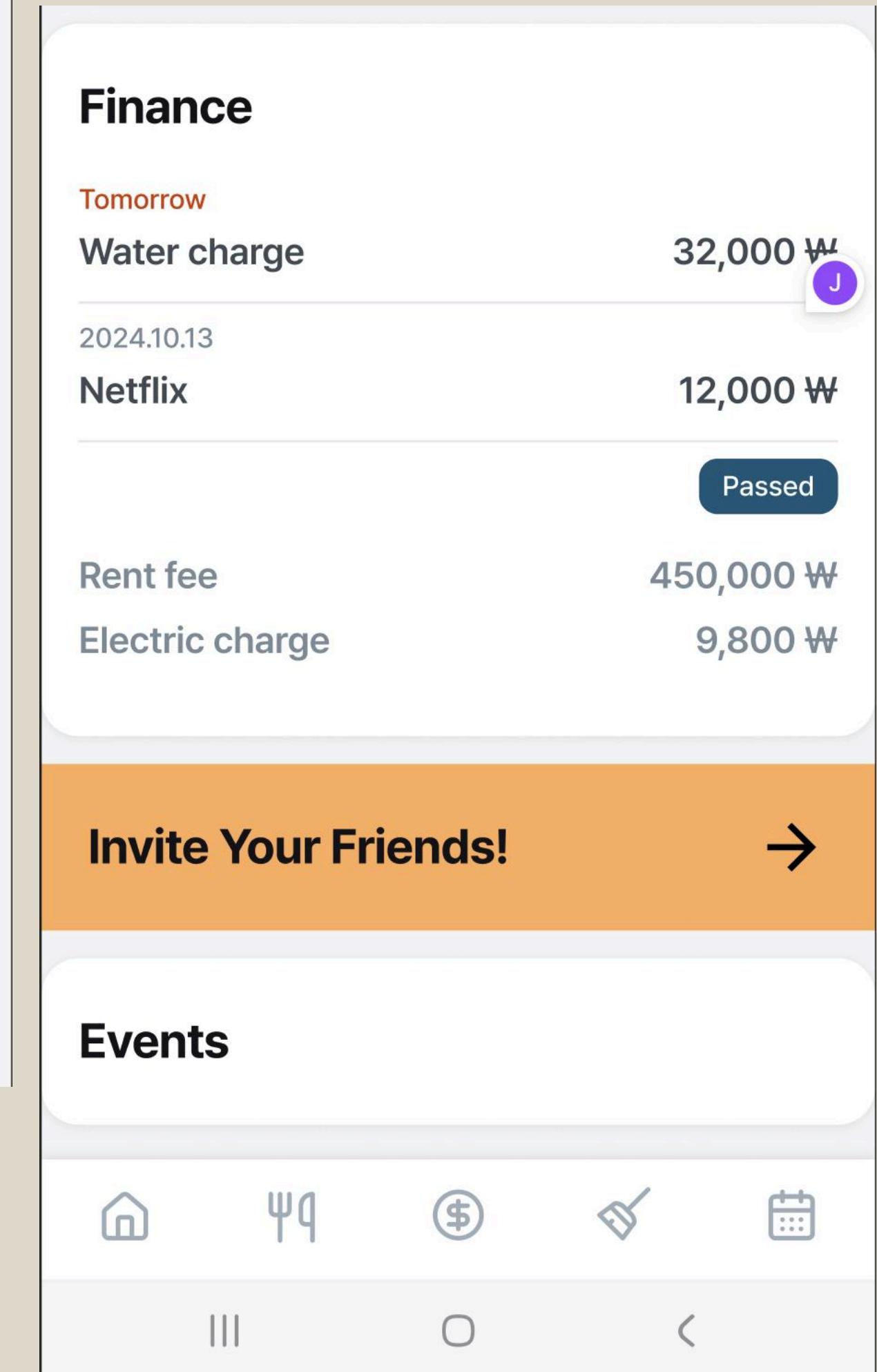
## NAV BAR



## INPUT UI



## HOME VIEW



3

# IMPLEMENTATION & CHALLENGE (TRIAL & ERROR)

# IMPLEMENTATION : FRONTEND

## Icon & Style Guide

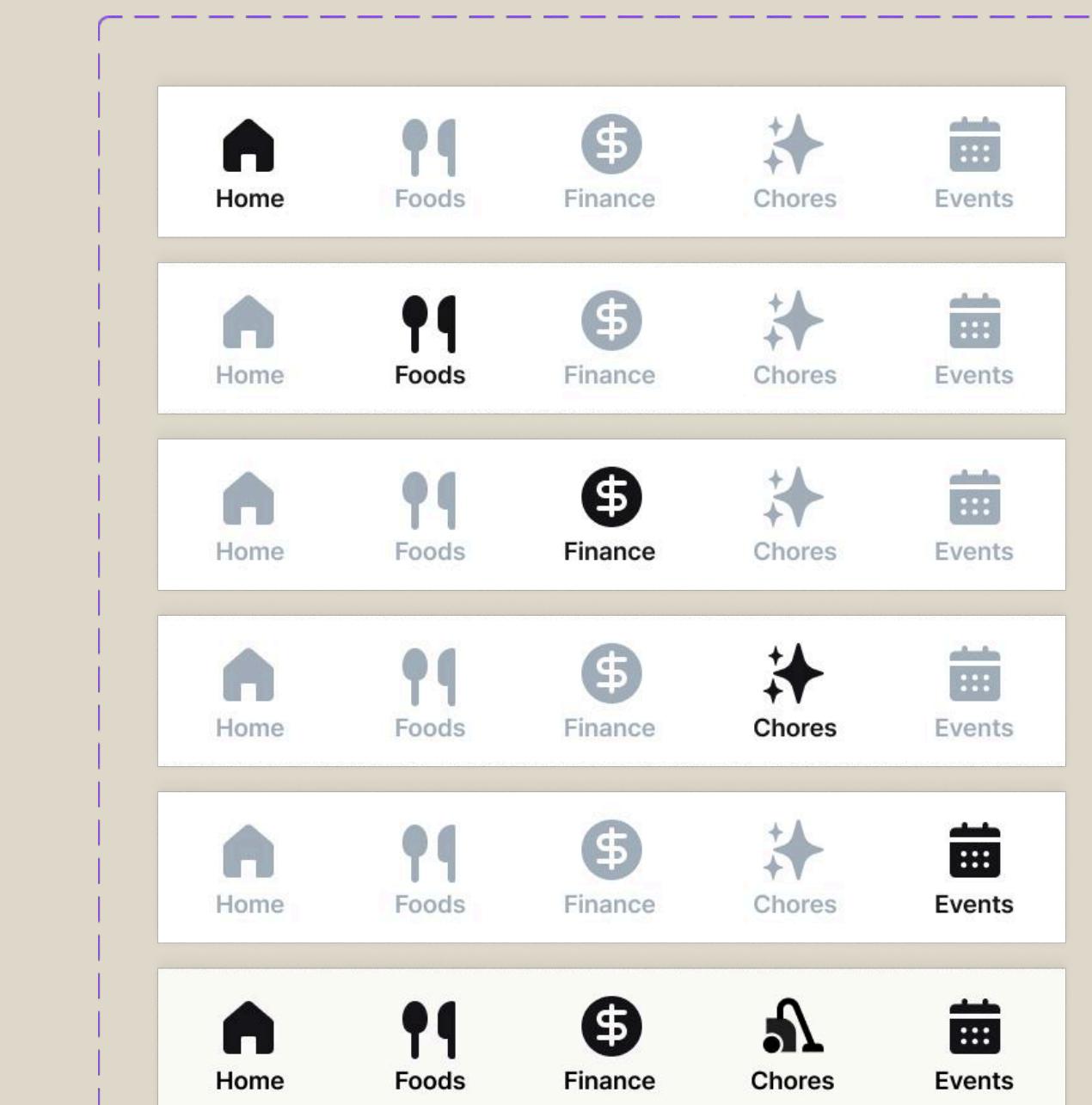
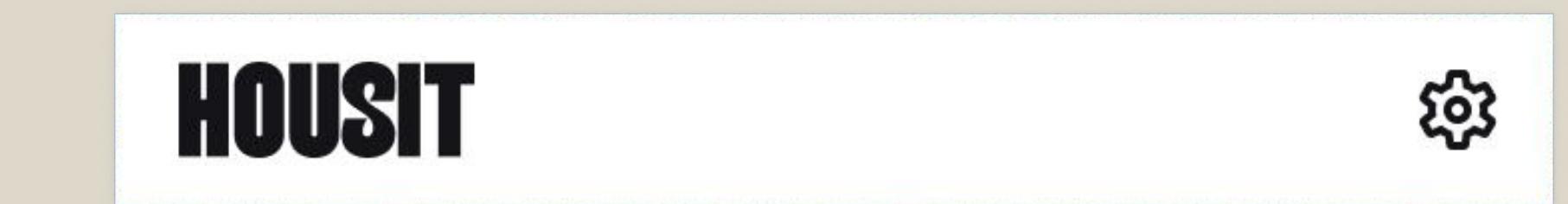
- **Icon**
- **Style Guide** : color, text size, box shadow

The screenshot displays a design system interface. At the top are three sets of icons: locks, users, and help/question. Below them are two sets of directional arrows (left, right, up, down). Further down are four sets of small icons: gear, list, grid, ellipsis, and a set of edit-like icons (+, X, pencil, trash). A color palette section shows a row of 10 grayscale swatches labeled 7 through 0, with 'Base' at the end. Below this are two rows of colored squares: one row in warm colors (orange, red) and another in cool colors (blue, green). To the right is a 'Display' table for 'Title' with columns for Level, Weight, Font Size, Line Height, and Description. It lists H1 (bold, 60px, 72px, label), H2 (bold, 48px, 60px, label), H3 (bold, 36px, 45px, label), and H4 (bold, 24px, 36px, label).

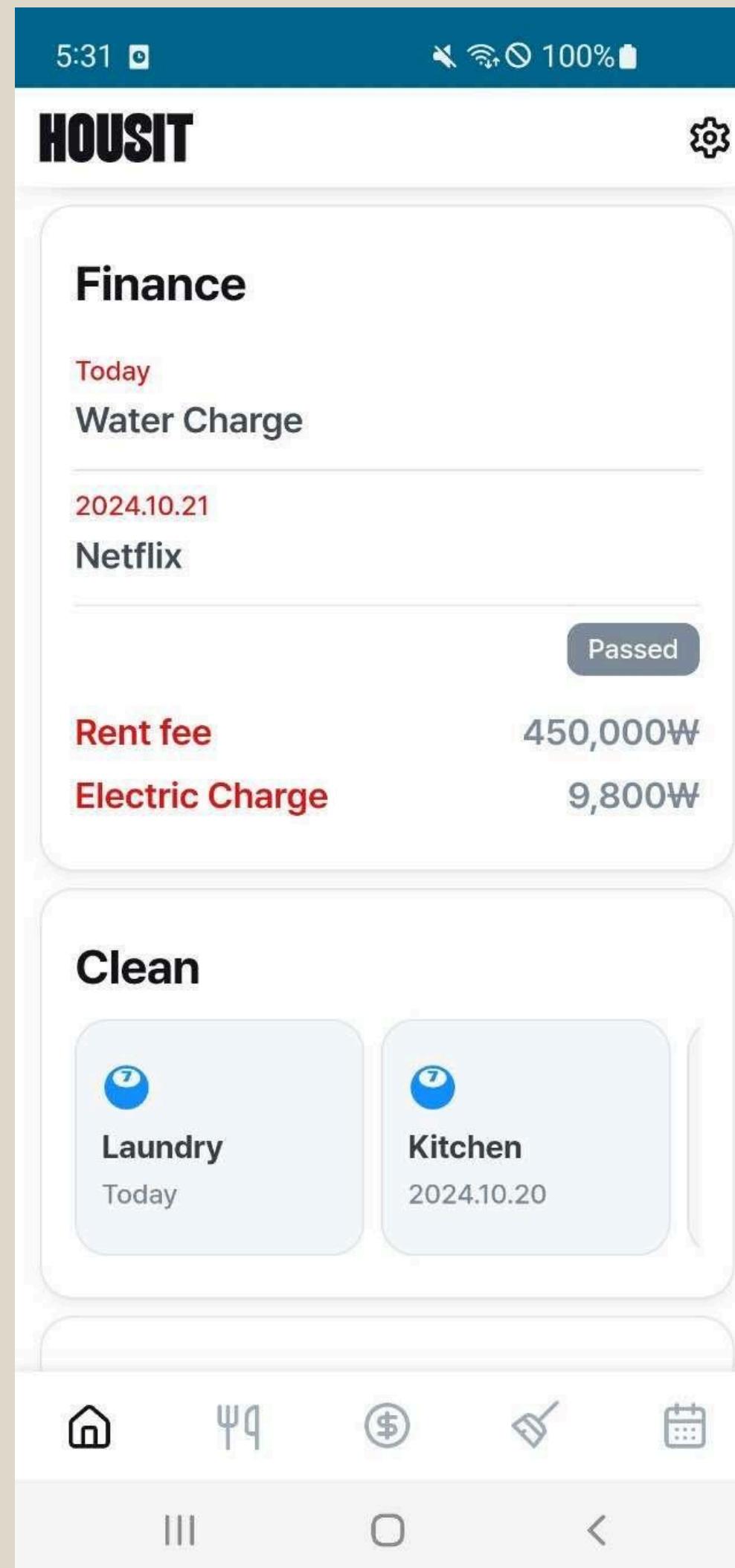
Level	Weight	Font Size	Line Height	Description
Title	Bold	60px	72px	label
H1	Bold	48px	60px	label
H2	Bold	36px	45px	label
H3	Bold	24px	36px	label
H4	Bold	21px	31.5px	label

## Re-usable Public Components

- header, nav-bar



# IMPLEMENTATION : FRONTEND



- **Made Home view**

#tested with mock dataset #API in progress

- **Adjusting web-view url to test the app on local**

#based on Android Studio build type

#not able to testing app **before deployment**

#using **personal PC ip address & portnum(3000)**

→ **Web-view url has been set!**

**VIDEO LINK**

# CHALLENGES : TRIAL & ERROR (FRONTEND)



**VIDEO LINK**

## Error

- Height of the center content between header and navigation bar  
( = `calc(100vh - (height of header) - (height of navbar))` )

## Trial 01

: Removed the 'height: calc' operation and set it to 100%

- Tried using dvh but the same thing happened,  
so we found that **viewport was not being loaded properly**.
- Fixed when testing app, but **content is being concealed in the bottom navigation**

## Trial 02 : Gave position as absolute and use 'bottom: height of navbar' to force size fixation

- Successful mobile testing via chrome's developer tools,
- but the same error(reverting back to the original)  
in a deployment environment as in the video.

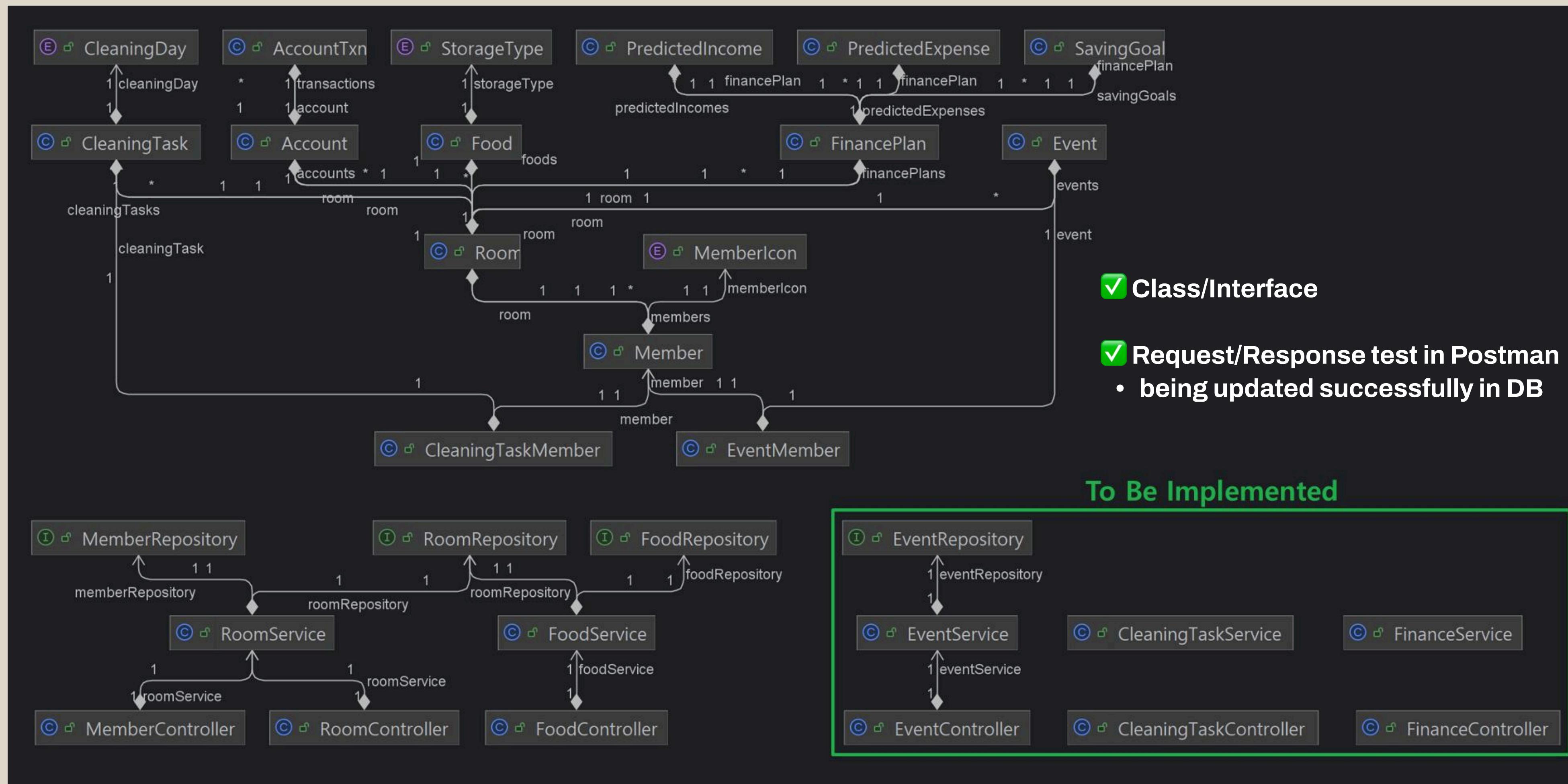
## Trial 03(Solution)

: Inserting a blank space equal to the height of the bottom navbar

→ Tested for usability issues → No problems within the app

# IMPLEMENTATION : BACKEND

## 1. Java Class Diagram



# IMPLEMENTATION : BACKEND

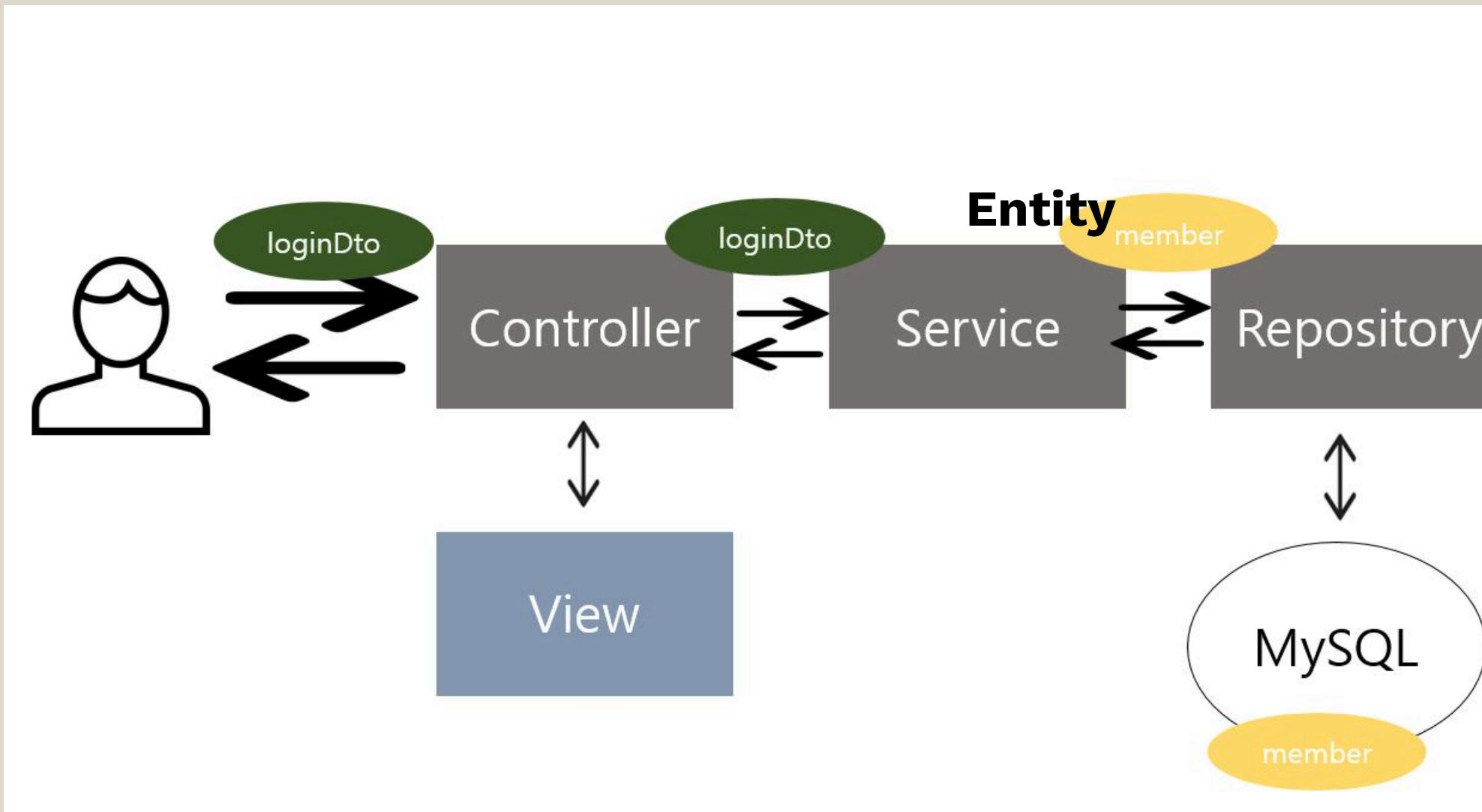
## + Consideration : Layer Dependencies

**DTO-to-entity conversion** are utilized in the **business layer**

to ensure the **controller layer never depends on entities**,

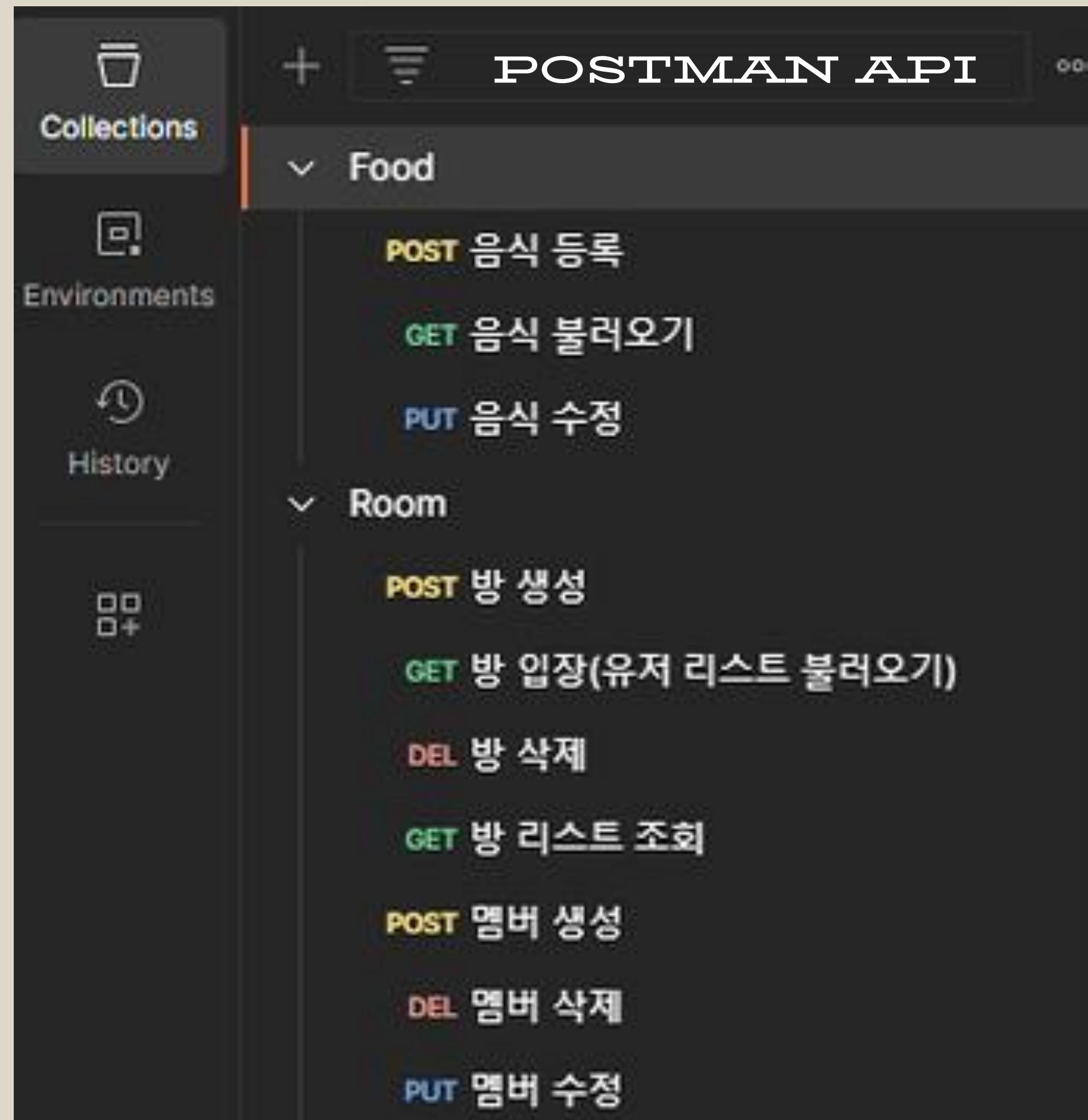
thereby **preemptively eliminating any potential repository layer dependencies**.

\*What is DTO(Data Transfer Object)? Entity?



# IMPLEMENTATION : BACKEND

## 2. Food & Room/Member API



Implementation of Controller / Service/ Repository layers  
for the features of Food & Room/Member

### Food

- Create a food item
- Get a food item
- Modify a food item

### Room

- Create a room
- Enter a room  
(Get member list)
- Delete a room
- Search the list of rooms

### Member

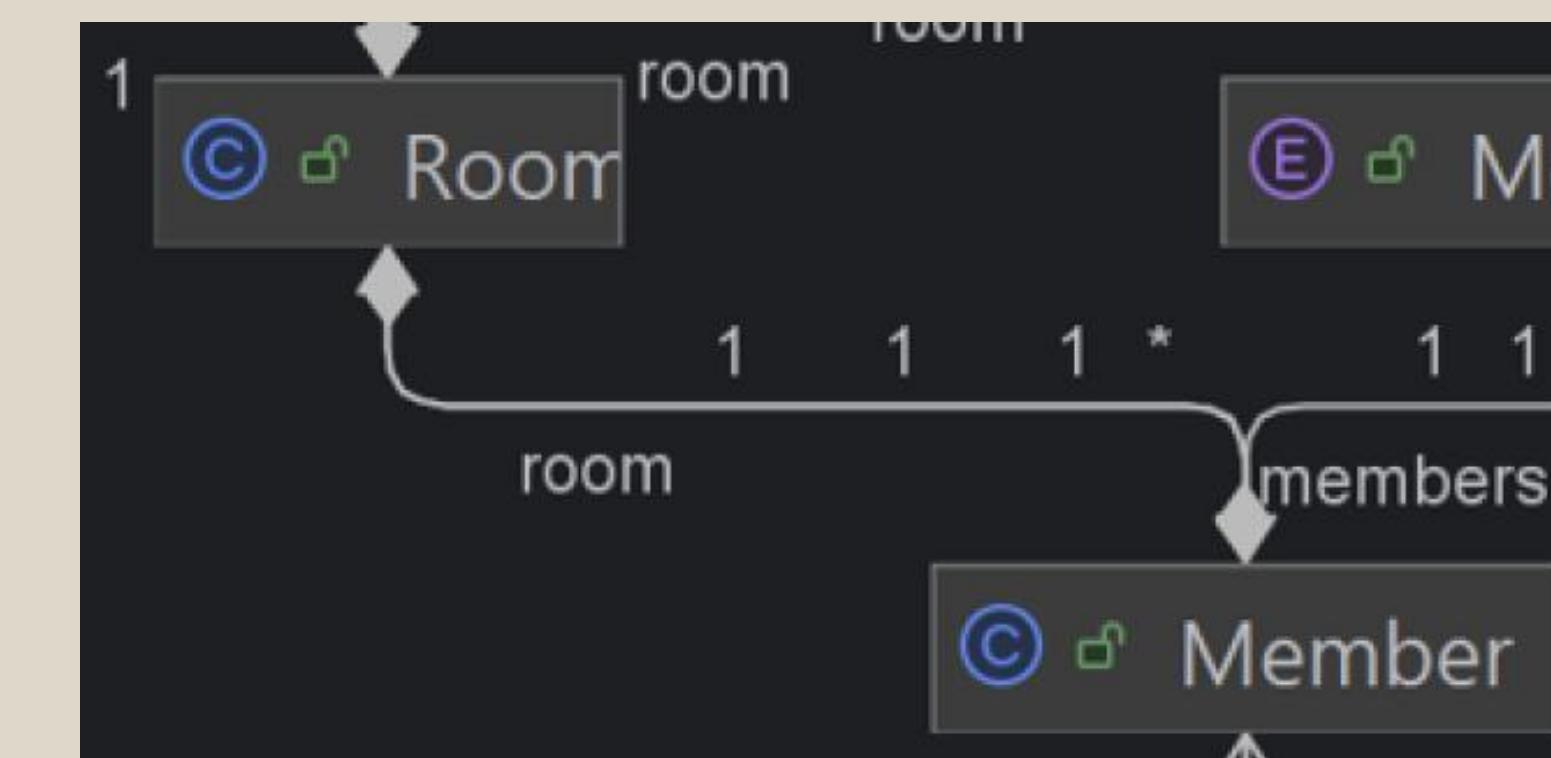
- Create a member
- Delete a member
- Modify a member

# CHALLENGES : TRIAL & ERROR (BACKEND)

## Error

For debugging purposes, the **toString method** was implemented for all entities.

**Bidirectional entities(Room & Member) with mutual references** caused an **infinite loop**.



## Solution

The issue was resolved

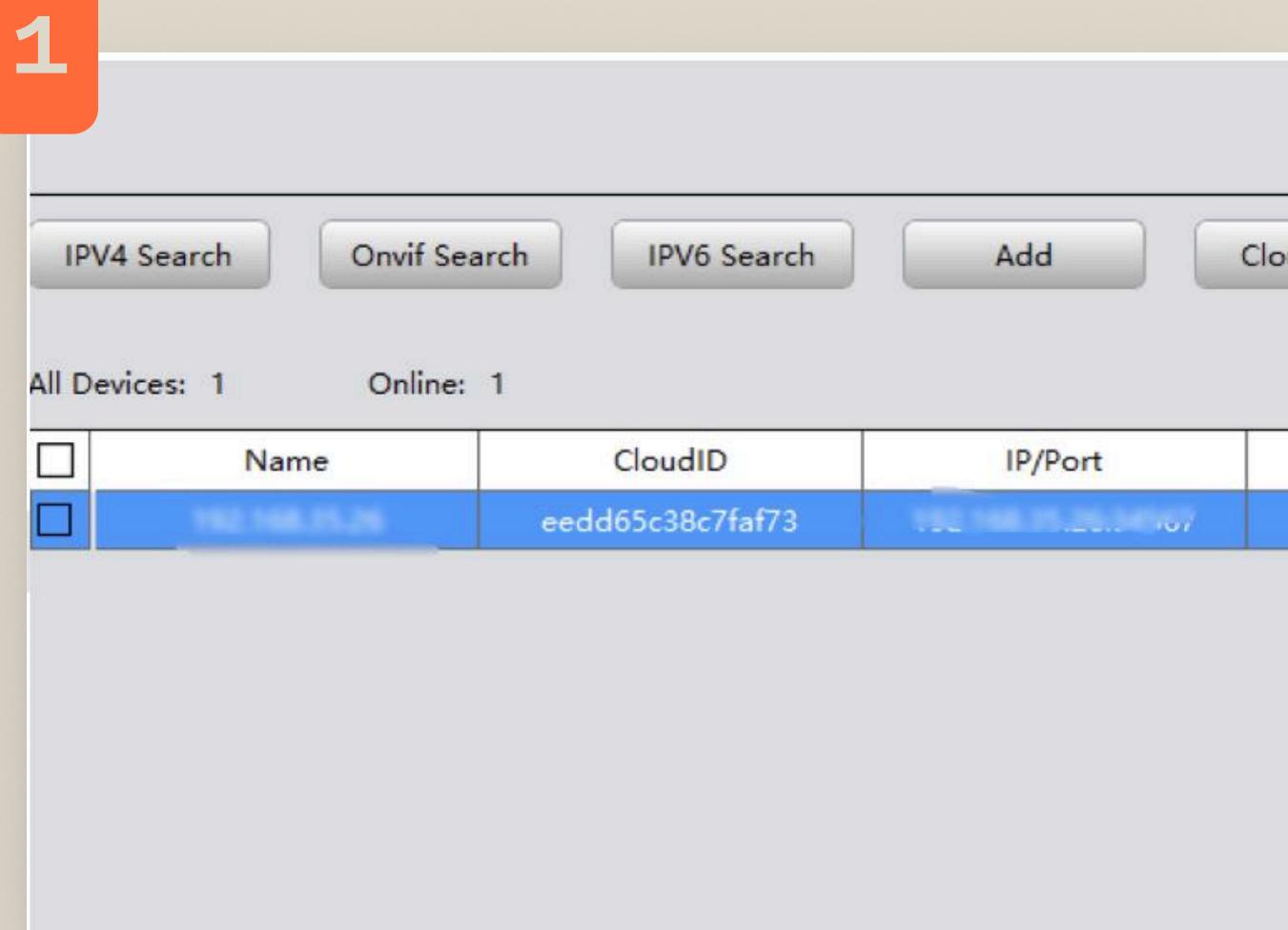
by preventing the toString method from printing mutually referencing objects.

# IMPLEMENTATION : OCR FEATURE

## 1. Connection to IP camera

- Purpose: To get a video frame from ip camera

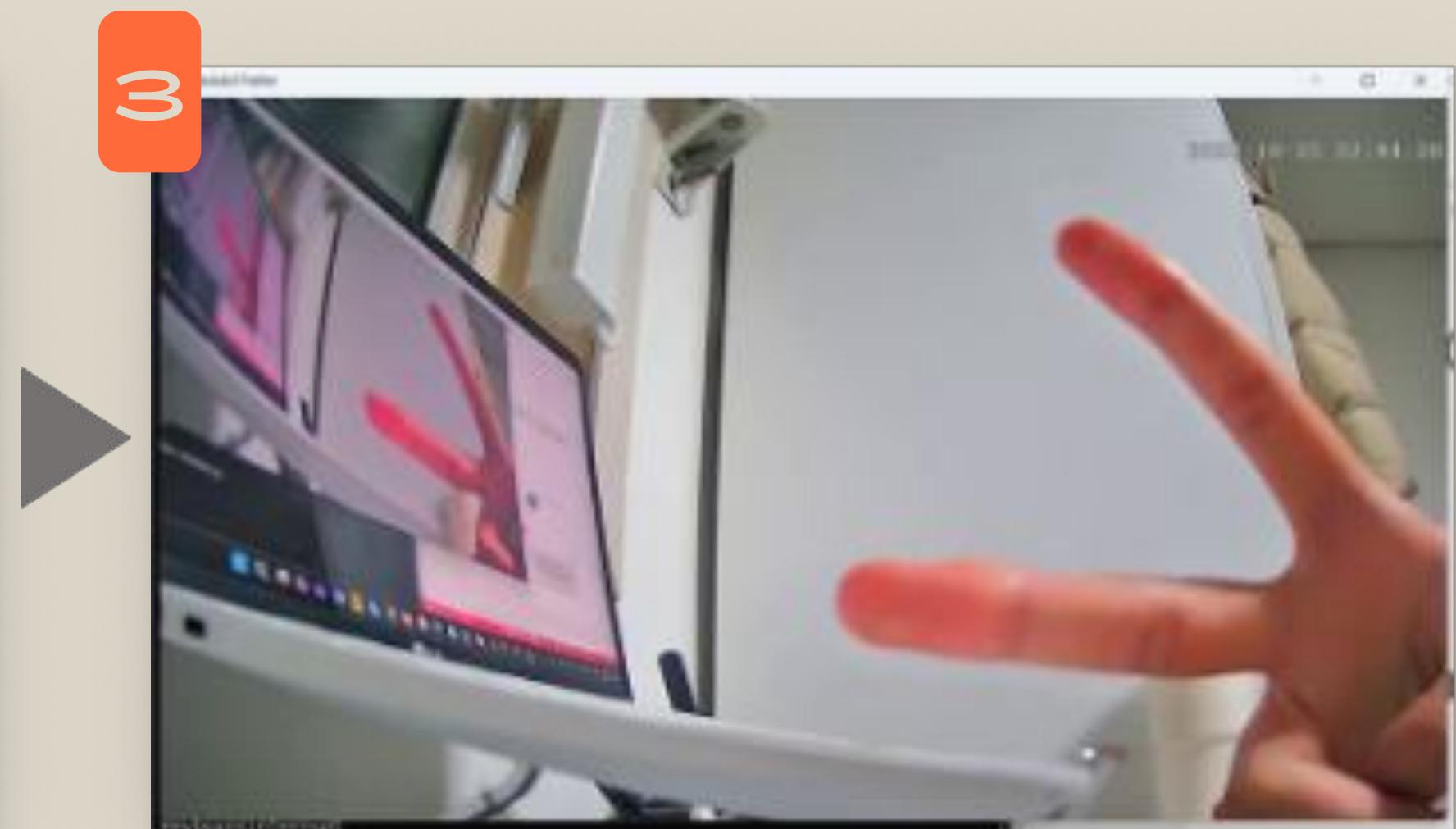
TRIAL



1



2



3

Check IP address of camera and enable RTSP

Set up port forwarding  
to allow external access to RTSP

Testing RTSP URL access using OpenCV

# IMPLEMENTATION : OCR FEATURE

## 2. Test pre-processing function and pytesseract

- Purpose: To test the recognition rate and evaluate the current level of recognition

1 TRIAL

```
Users\LG>pip install pytesseract
Collecting pytesseract
  Obtaining dependency information for pytesseract from https://files.pythonhosted.org/packages/7a/33/8312d7ce74670c9d39a532b2c246a853861120486be9443eebf048043637/pytesseract-0.3.13-py3-none-any.whl.metadata
    Downloading pytesseract-0.3.13-py3-none-any.whl.metadata (11 kB)
Collecting packaging>=21.3 (from pytesseract)
  Obtaining dependency information for packaging>=21.3 from https://files.pythonhosted.org/packages/08/aa/cc0199a5f0ad350994d660967a8efb233fe0416e4639146c089643407ce6/packaging-24.1-py3-none-any.whl.metadata
    Downloading packaging-24.1-py3-none-any.whl.metadata (3.2 kB)
Collecting Pillow>=8.0.0 (from pytesseract)
  Obtaining dependency information for Pillow>=8.0.0 from https://files.pythonhosted.org/packages/dc/83/1470c220a4ff06cd75fc609068f6605e567ea51df70557555c2ab6516b2c/pillow-11.0.0-cp311-cp311-win_amd64.whl.metadata
    Downloading pillow-11.0.0-cp311-cp311-win_amd64.whl.metadata (9.3 kB)
Downloading pytesseract-0.3.13-py3-none-any.whl (14 kB)
Downloading packaging-24.1-py3-none-any.whl (53 kB)
  54.0/54.0 kB 2.7 MB/s eta 0:00:00
Downloading pillow-11.0.0-cp311-cp311-win_amd64.whl (2.6 MB)
  2.6/2.6 MB 6.3 MB/s eta 0:00:00
Installing collected packages: Pillow, packaging, pytesseract
Successfully installed Pillow-11.0.0 packaging-24.1 pytesseract-0.3.13

[notice] A new release of pip is available: 23.2.1 > 24.2
[notice] To update, run: python.exe -m pip install --upgrade pip
```

Environment set up for using pytesseract

2

```
C:\Python311>python python_ocr.py
 * Serving Flask app 'python_ocr'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 738-362-103
```

Simple flask server to recognize product name and expiration date

3

POST http://127.0.0.1:5000/upload

HTTP New Collection / http://127.0.0.1:5000/upload

POST http://127.0.0.1:5000/upload

Params Auth Headers (9) Body Scripts Settings Cookies

Key	Value	Content-Type	Des...	Bulk Edit
<input checked="" type="checkbox"/> brand_image	File	<input type="file"/> KakaoT...	Auto	
<input checked="" type="checkbox"/> expiration_date	File	<input type="file"/> KakaoT...	Auto	

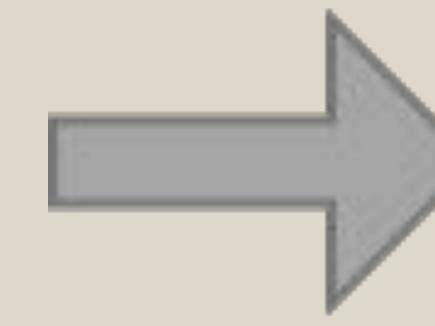
Testing a POST request with image files using Postman

# IMPLEMENTATION: OCR FEATURE

## 2. Test pre-processing function and pytesseract

- Purpose: To test the recognition rate and evaluate the current level of recognition

## TEST CASE 1



## TEST CASE 2



Body ▾ 200 OK • 17.76 s • 2.75 KB • e.g. ○○

Pretty Raw Preview Visualize JSON ▾ ⌂ ⌂

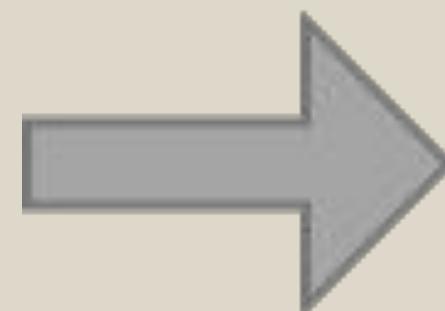
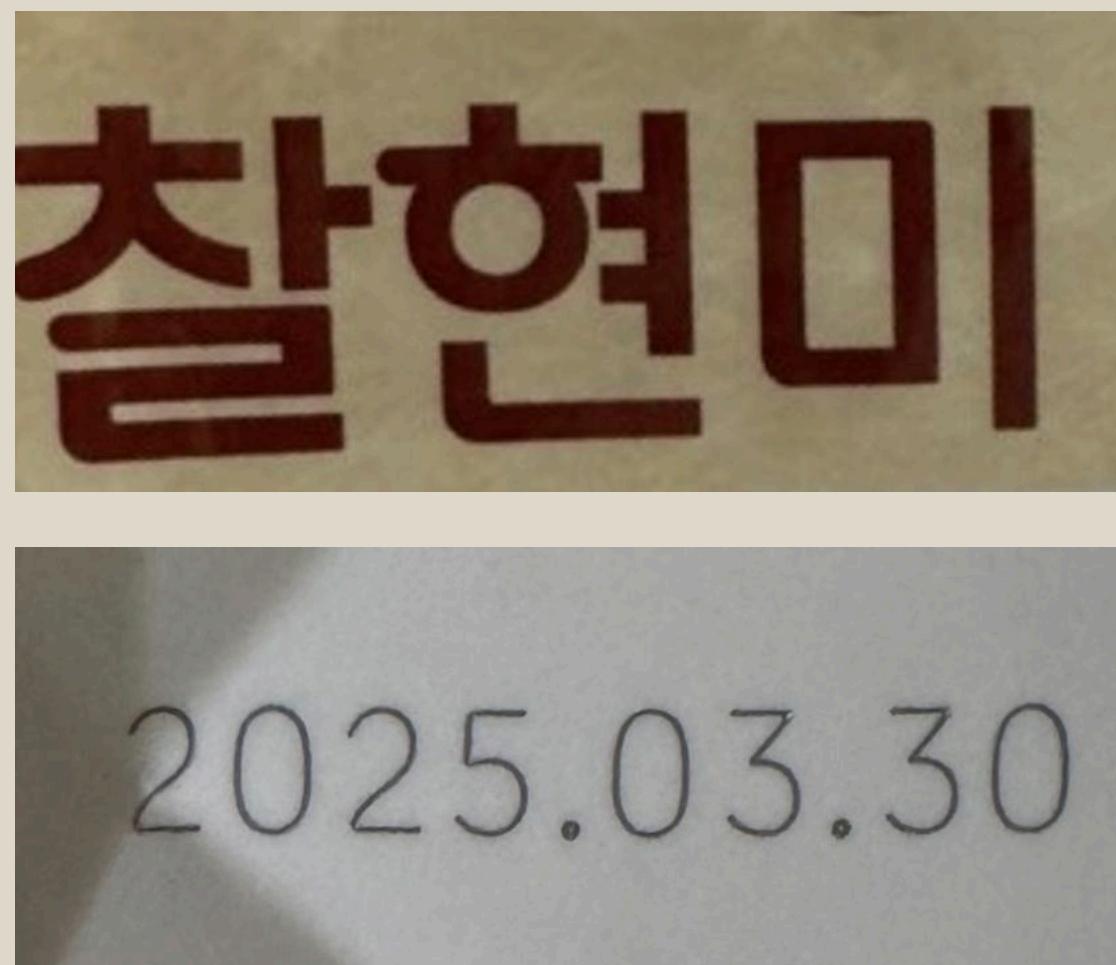
```
1  {
2      "brand_name": "젝_늦._얇쑥육빼『＼』 데＼n줄 빼 기 8루 .|\n,... 7` = [뜯났 ㅠ
3          ㅠ . `훗 '\n06 . . . . 주 사\n1 .3 오2 레 센\n《 땅 \\ {\"}.` .270 옷＼n'놓.
4          칙._.,훗 5 깎 구캐 칙._읍.몇박 .읍 읍_ . 0 ..\n- 12267 .총 더＼n내 . 다할
5          히 소 , 저\n{ 영밖 오 / 총 스 조 를 .\n, 6 은 아 주무 후 제스 6 . 발\n` ,
6          컨침m 5 소 아\nn순 오 2존 했 57100 1\n` ) 헤 822550 0 피＼n모 . 늘 쓸\n290 .
7          232006 분 .\n으 굴 하 / 노 > 슬리\nn0019 , 0 12087 8905\n\\)- : 도4 42\n` 
8          짐` 다 미이 05063 0798\n6 렸 0 토끼 힐\n나 아무 바 아 아 9 * 으 예 제\nn7.
9          ( 100985 `빼켠놓, `털효밌찻워뺀금눌줄듯훌흉앤훠훔죠`총＼n깃 ( 예 내 베과 `'
10         00\n부 . 00000\n있 290 바 이20이 은 네 나 위 갔 델 드 라 이시 ) 이 이 니 백
11         이 난 2 반\n. 개 86 3 매 인트 .\n006 퓨 사 16299 에 나 220 이 2시 000 바
12         힘 00 바 비 이0무 이 나 7\n르 땀넨 기 3 바 눈 자 비 버 나 파 나 0 바 나이 가
13         안 바 이\n~ 난 와 시 긴 강 보 베 듬 아비 9446\n: 0리 수이 수 니 시 빈 가 아
14         아 지에 다 가\n: 6 47 랭돌흑을호쿰＼흐 , 줄＼흔을찼을쫓쫄흘않습.
15         `젠흔를끓낮듀 옳 읍총.`＼＼몇뺏술을효＼＼n` 쇼 . 020006 이 아거 26 나 아 아
16         스 하 오아 쟁 아야\n0 나이 40이 상아 아야 22\n, 662 할아 시기 수 아간\nn547:2
17         재 ) , 육 198 으 일 `$*빼 가 있시\n2 )7)] 퀸 '켠(능'흔푸'요 62 .. 。『..쐐＼
18        ＼＼통。 * 품확" 총, `＼＼*딜힐영 , :\n86287300096 , 무시 00\n7 20066 매 "
19         \n줄물호`'/. 찢뜯뒹/챈、」」 설 : 류 > ",
20         "expiration_date": null
21     }
```

# IMPLEMENTATION : OCR FEATURE

## 2. Test pre-processing function and pytesseract

- Purpose: To **test the recognition rate** and **evaluate the current level of recognition**

TEST CASE 3



Body Cookies Headers (5) Test Results

Pretty Raw Preview Visualize JSON ↻

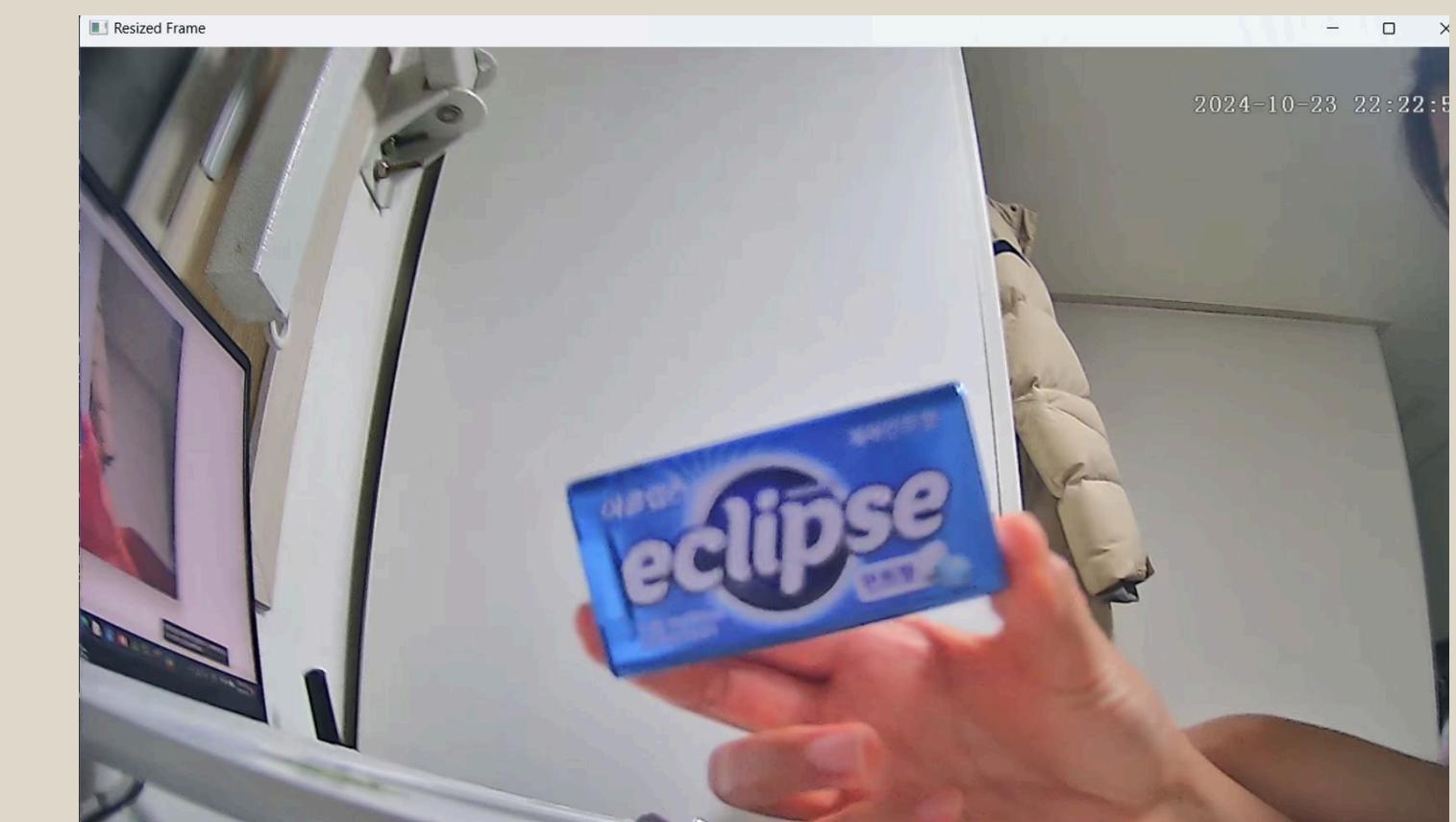
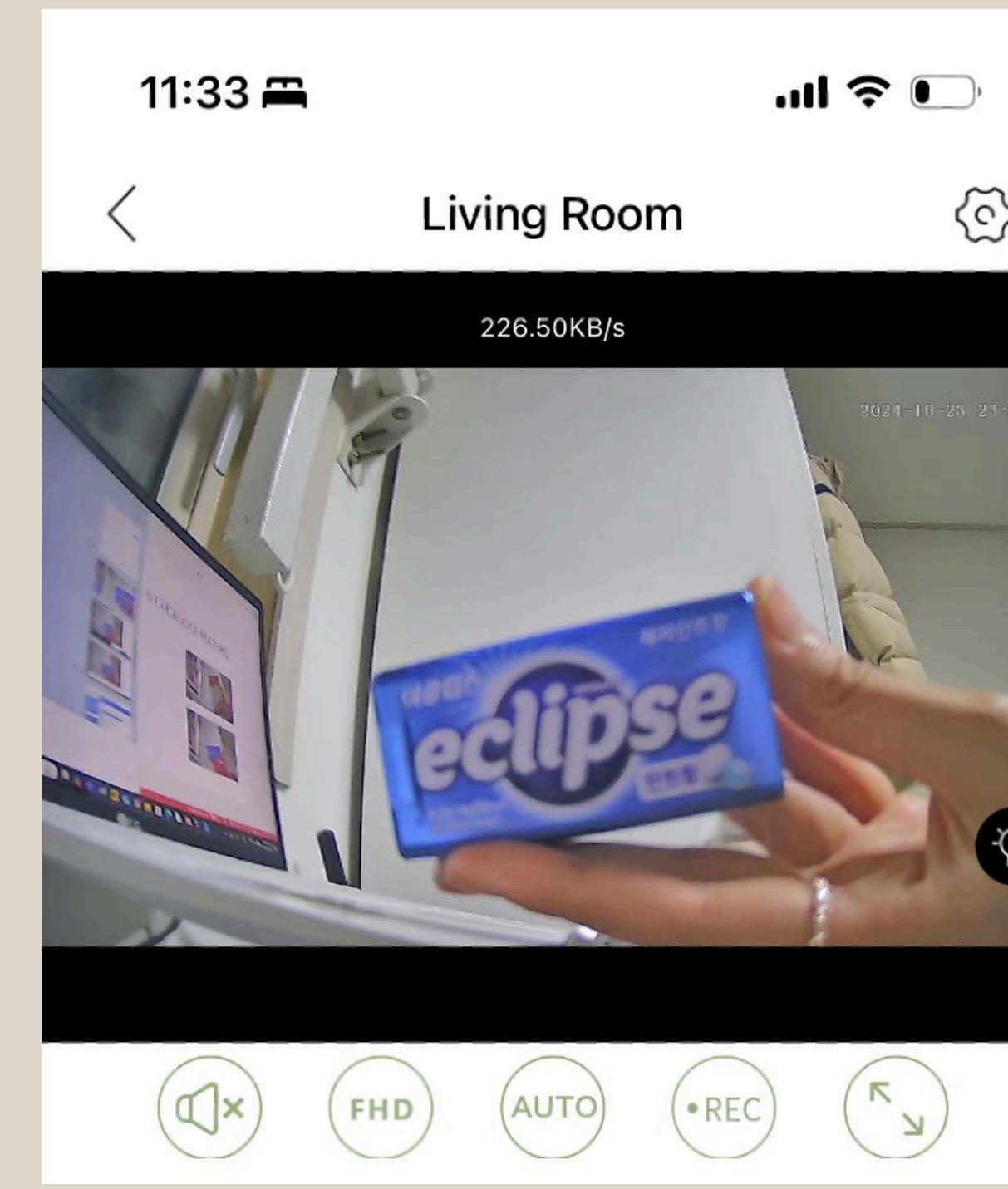
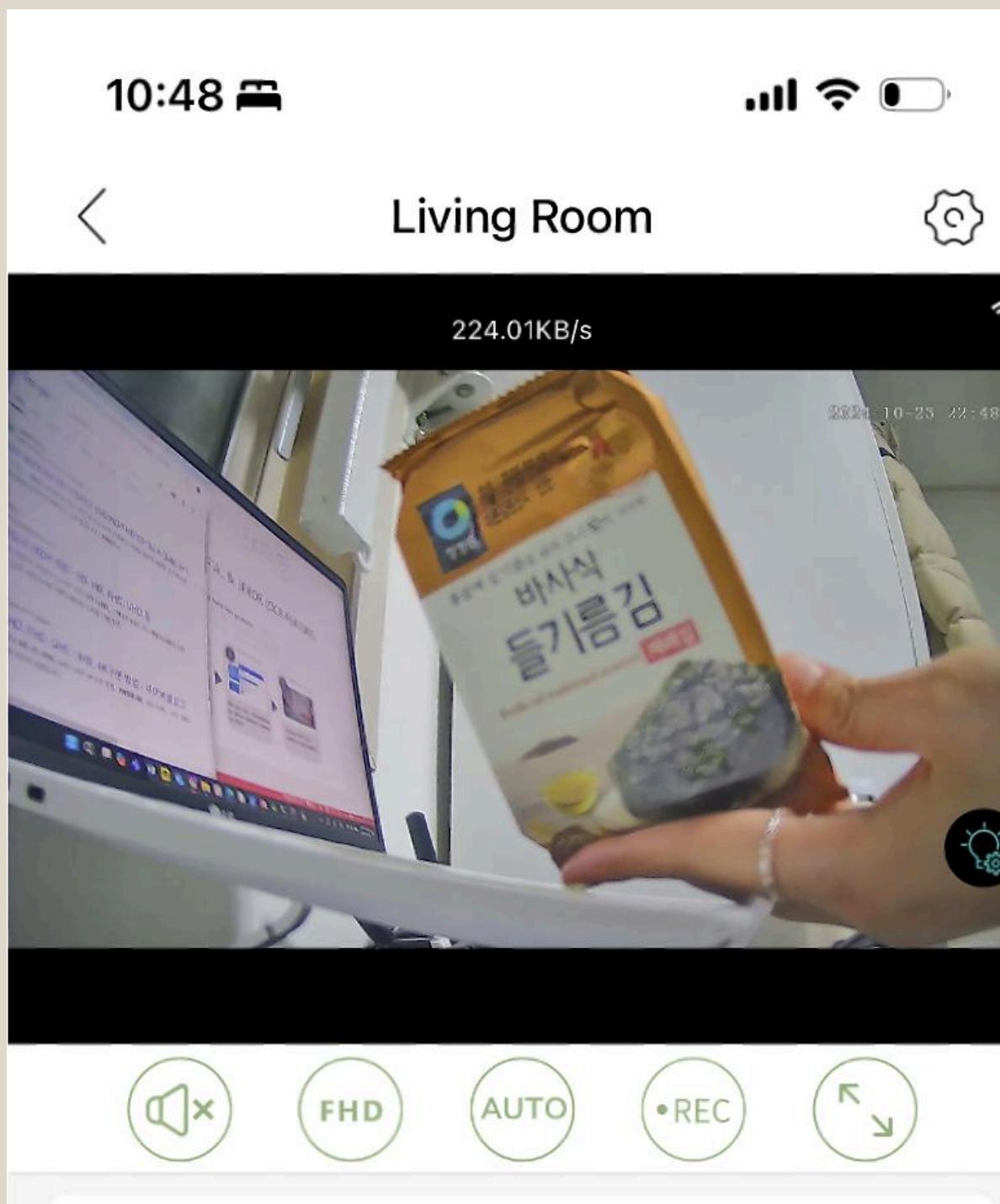
```
1 {  
2   "brand_name": "찰 현 미",  
3   "expiration_date": "025.02.50"  
4 }
```

# CHALLENGES : TRIAL & ERROR (OCR FEATURE)

## Point

01 Resolution of Frame

02 No efficiency with pre-processing function



# CHALLENGES : TRIAL & ERROR (OCR FEATURE)

# <No pre-processing>

# Point

# 01 Resolution of Frame

## 02 No efficiency with pre-processing function

# <Gray scale & binary>

# <Gray scale & binary & denoise>

```
{  
    "brand_name": "찰현미",  
    "expiration_date": "250.02.50"  
}
```

```
    "brand_name": "찰현미",
    "expiration_date": "025.02.50"
}
```

```
{  
    "brand_name": "다1 아 으 남 ) /\n\n6 . 6 뚜 기발 -\"\\n\\n초이 제 훗얄놓*  
    17\\n\\n: (혹___.읍`.빌 : " 게\\n\\n1 ( 으 노 술 다\\n、 을 사 장\\n\\n글 순  
    이다\\n메 ~ 시 지\\n\\nπ π 0061000460 니 6 든 601048 80 ○ 6 읍 쵸는\\n% 니  
    191\\n\\n남 설 의 100 * ? /\n2/ 사 잘언 ~ 。",  
    "expiration_date": null  
}
```

# 4.

## THINGS TO IMPLEMENT

# **THINGS TO IMPLEMENT (DESIGN)**

**Designing views for each features  
(Food, Cleaning, Finance, Event, Setting)**

# THINGS TO IMPLEMENT (FRONTEND)

**Implementing features & views**  
according to the design and APIs

# THINGS TO IMPLEMENT (BACKEND)

## 01 Setting constraints for **invalid input constraint** + **Exception handling**

- Filtering invalid inputs and Alerting users(in frontend)
- Filtering again in backend and Sending a Response

## 02 Prevention of **Food item deletion** from other members

- **Malicious/unintentional deleting** can happen.
  - API : DELETE method to the corresponding food item
- Need a way to **protect from this**.
  - Check the member's authority of items for getting access for deletion by JWT(JSON Web Token) or Session

# THINGS TO IMPLEMENT (OCR FEATURE)

## 01 Resolution of Frame

- Text recognition with **video frame delivered via RTSP url**
- Text recognition with **uploaded picture**  
with product name & expiration date

## 02 Accuracy increment

- **Pre-processing** with **various functions**
- **Resizing the photo** to **emphasize most important text area**

MIDTERM PRESENTATION (OCT 25TH FRI)

# THANK YOU

HOUSIT

- TEAM A+
- HOUSIT, HOW WAS IT?
- WELCOMING ANY QUESTIONS/IDEAS!