

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

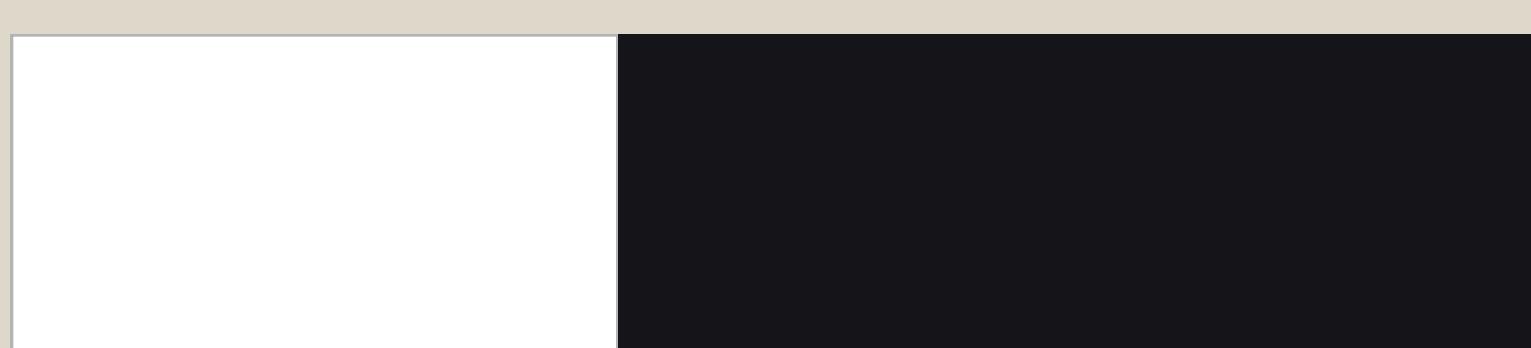
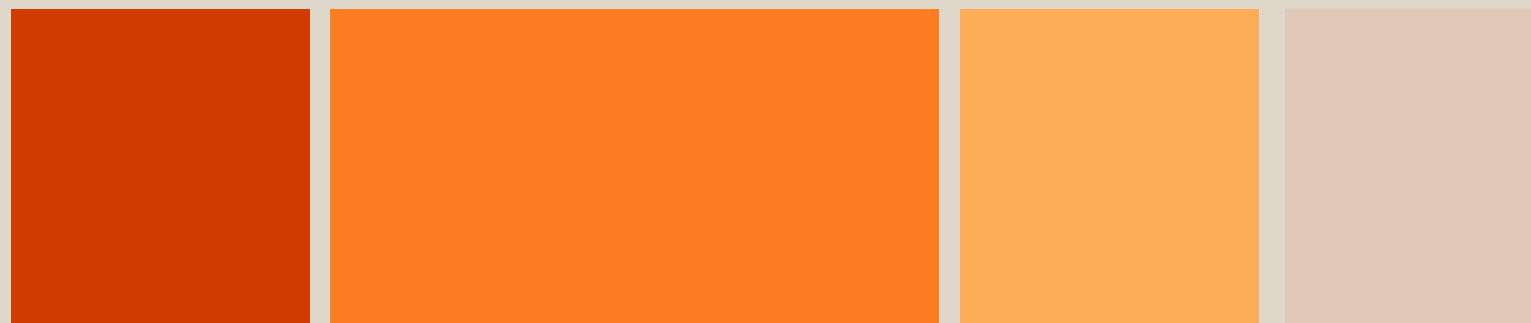
DESIGN & UI/UX

DESIGN & UI/UX



HOUSIT
HOUSIT

COLOR



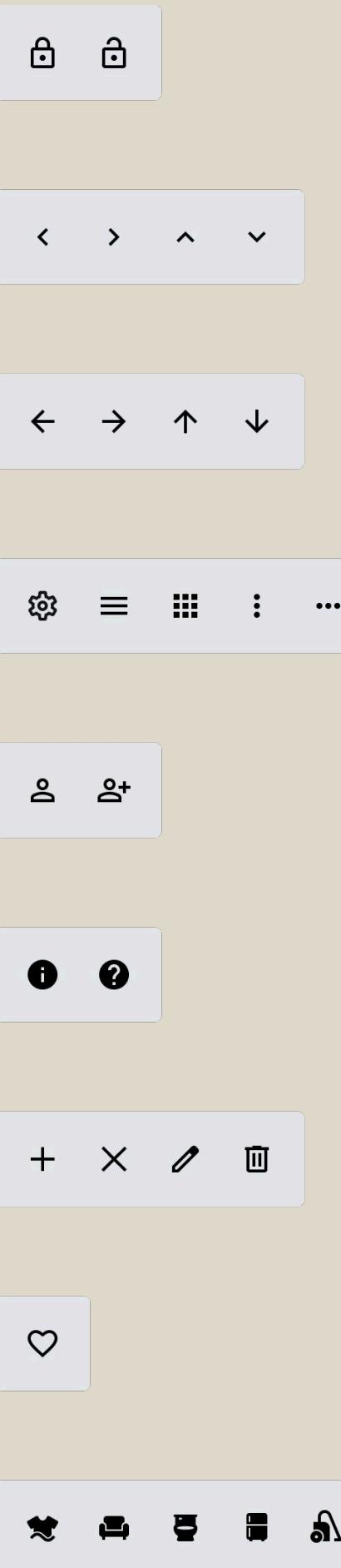
TYPOGRAPHY

Typography				
Description	Level	Weight	Font Size	Line Height
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
	B	Bold	16px	28px
	Body	Medium	16px	28px
	Label	Bold	14px	24.5px
	Label	Medium	14px	20px
	Label	Medium	12px	16px

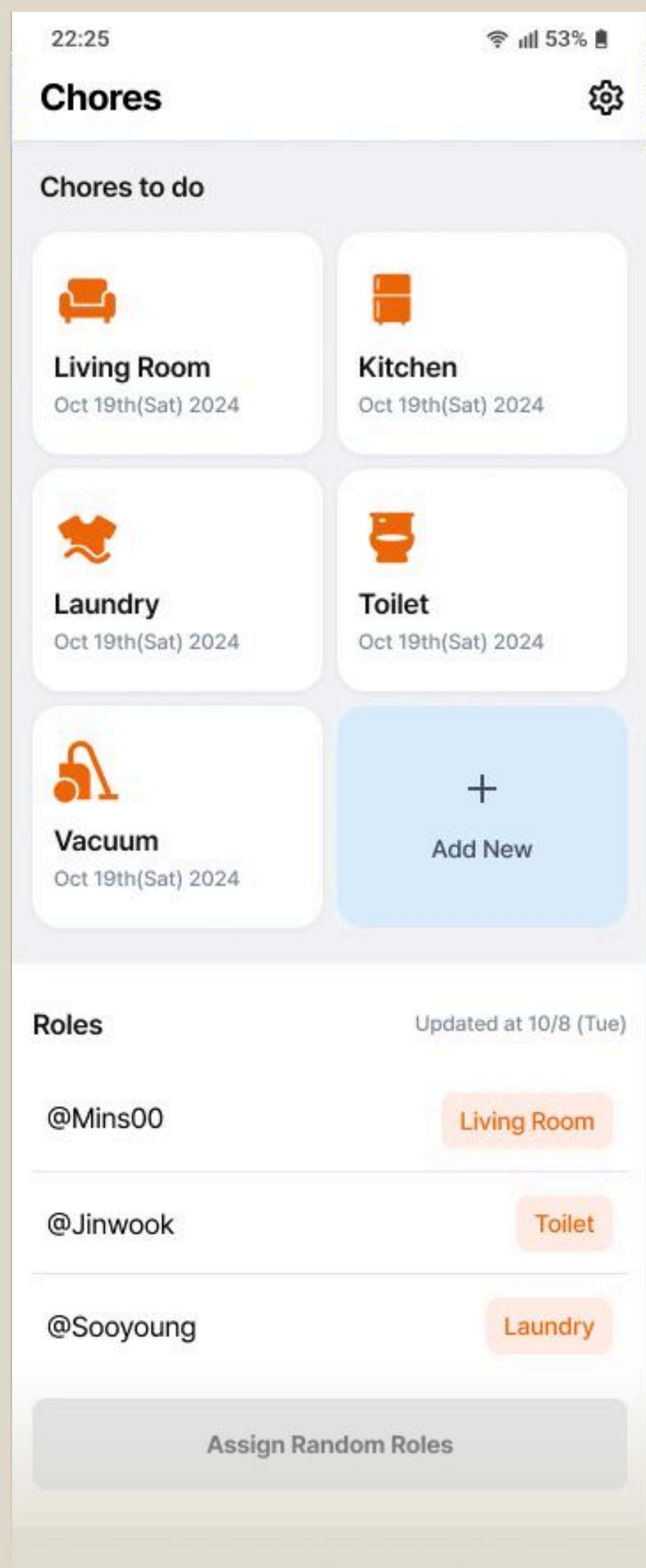
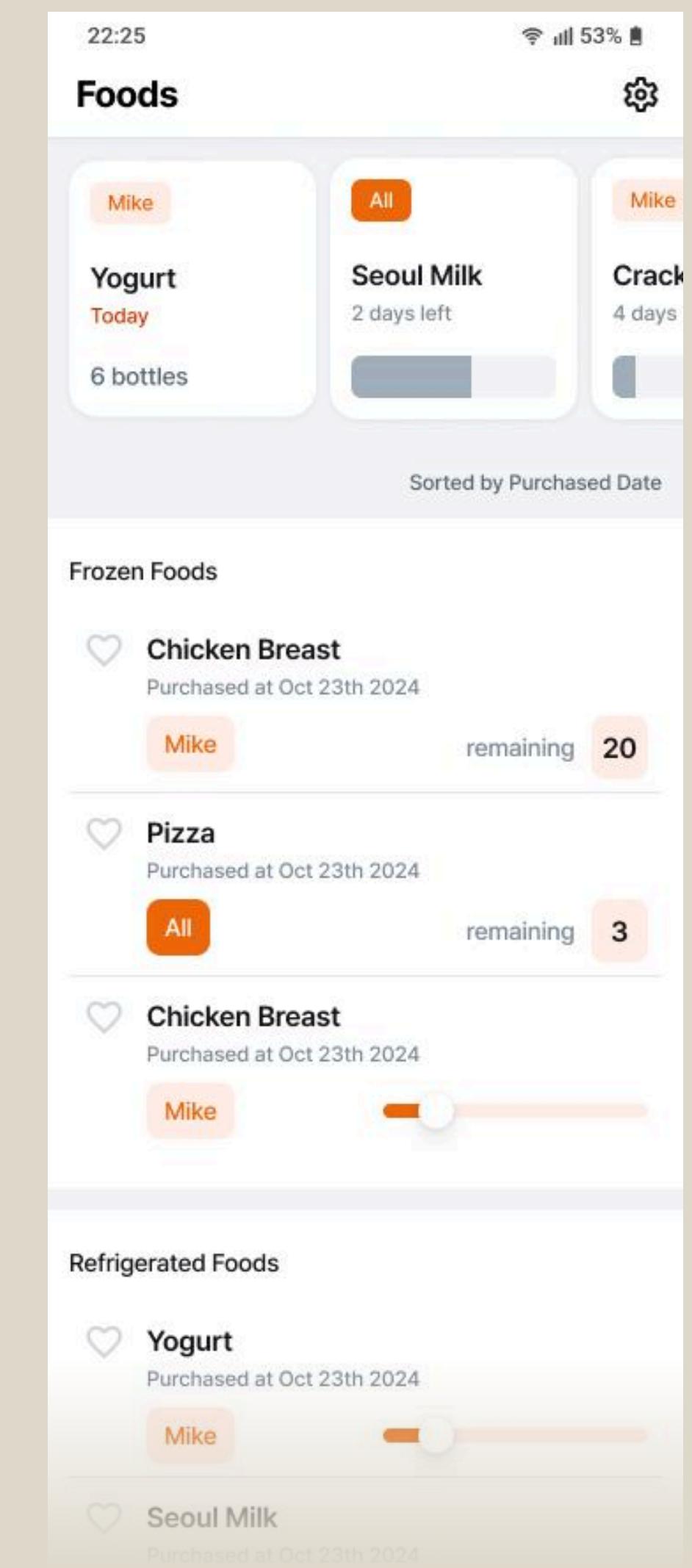
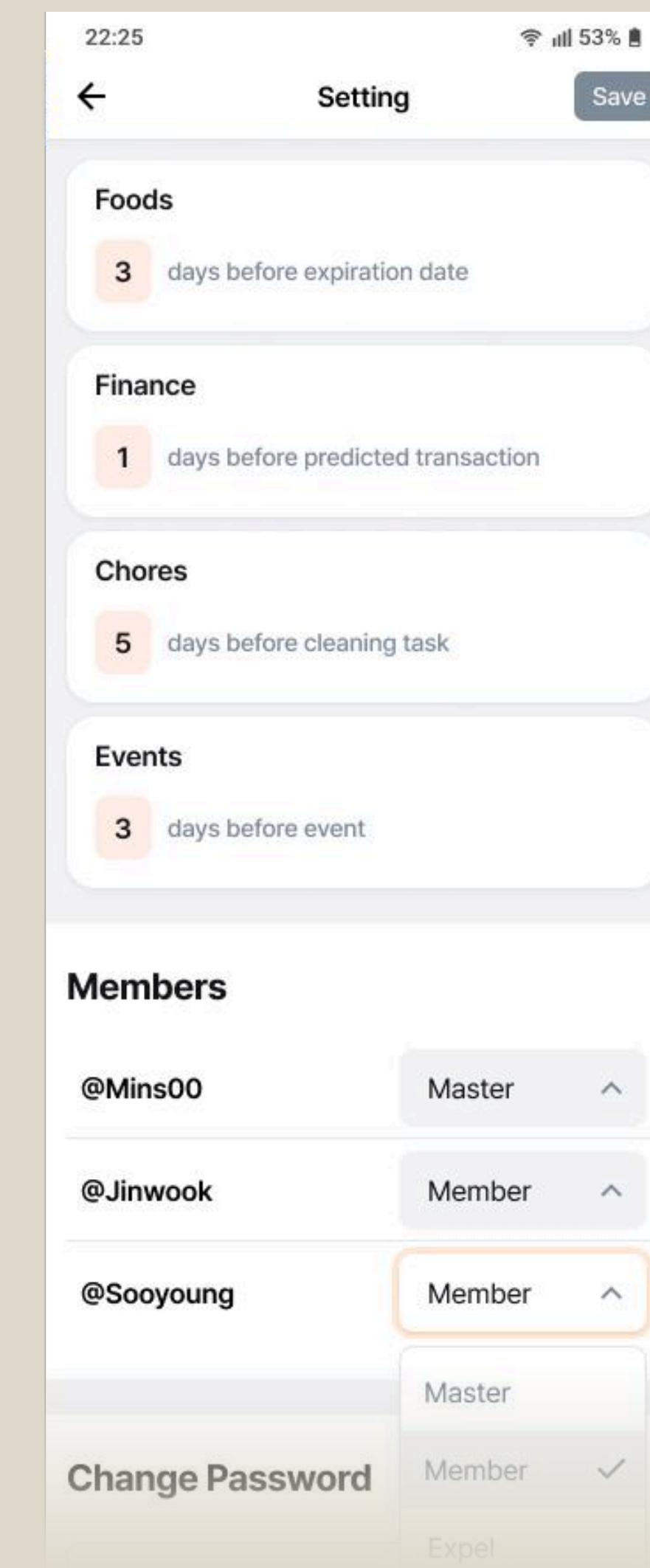
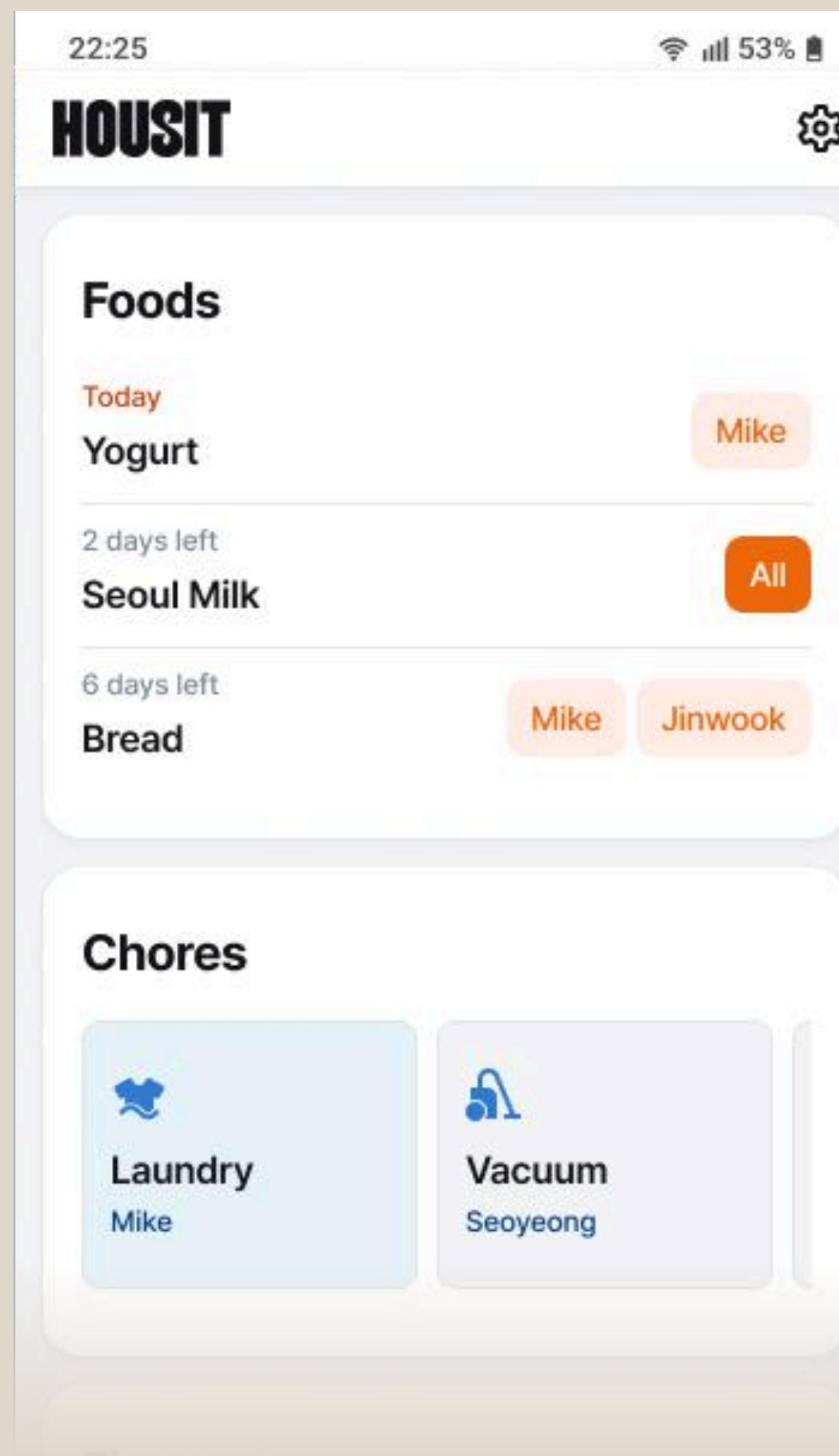
SHADOW

Elevation	
Shadow/S	
Shadow/M	
Shadow/L	
Dimmer	
Dimmer/3	
Dimmer/2	
Dimmer/1	

ICON



DESIGN : UI/UX



3

IMPLEMENTATION & CHALLENGE (TRIAL & ERROR)

IMPLEMENTATION : FRONTEND

Icon & Style Guide

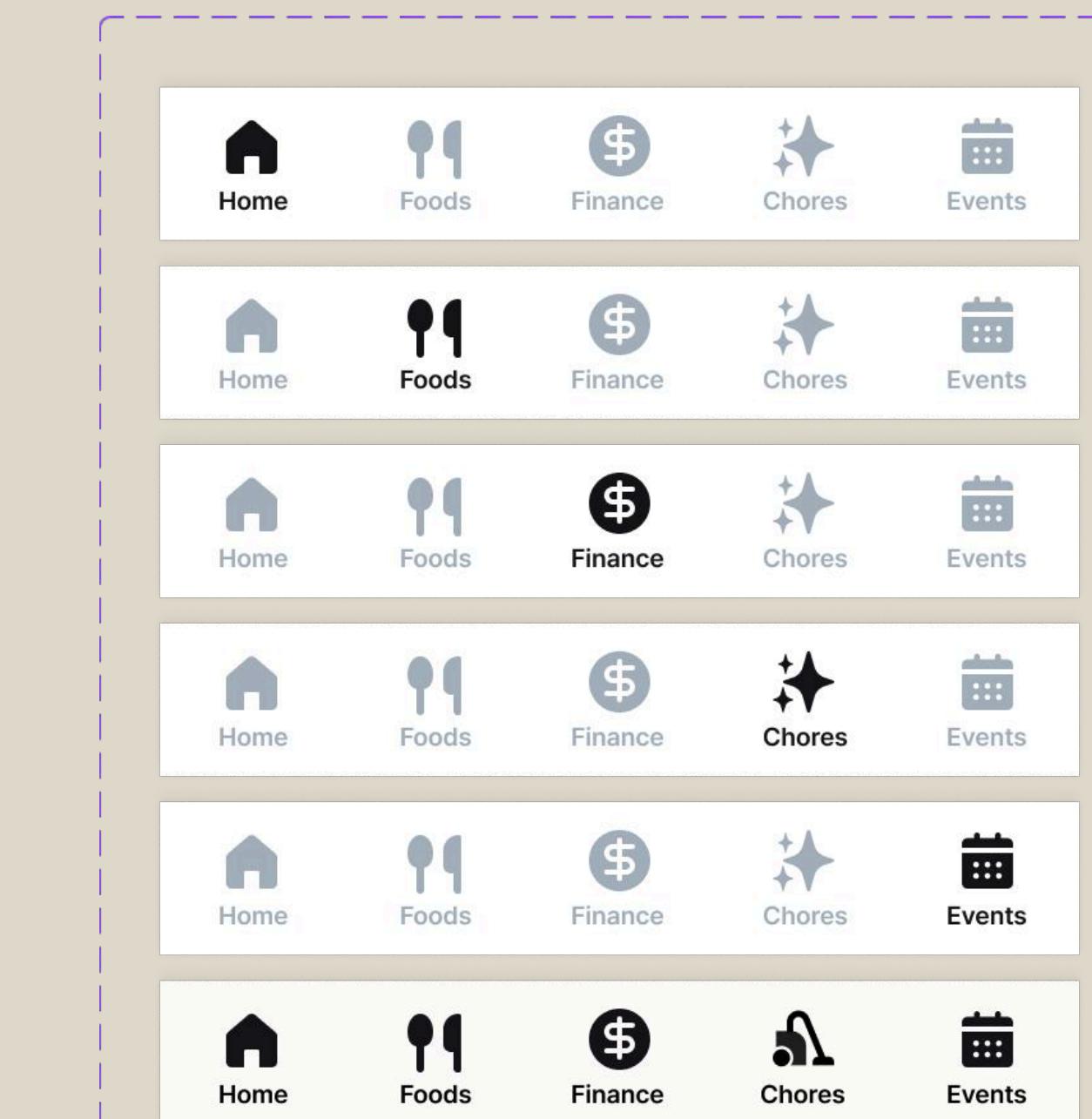
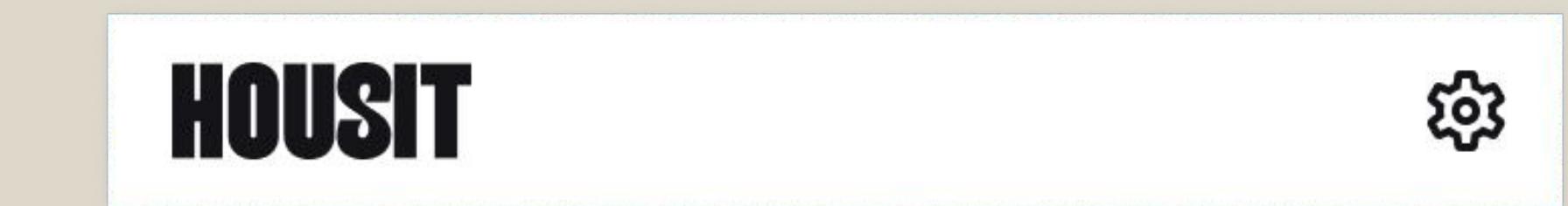
- **Icon**
- **Style Guide** : color, text size, box shadow

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 row of five icons (+, X, edit, trash). A color palette section shows a grid of 12 colors labeled 0 to 7 and Base. Below the palette are two rows of colored squares. To the right is a 'Display' table for 'Title' with columns for Level, Weight, Font Size, Line Height, and Description. It lists H1 through H4 with their respective styling details.

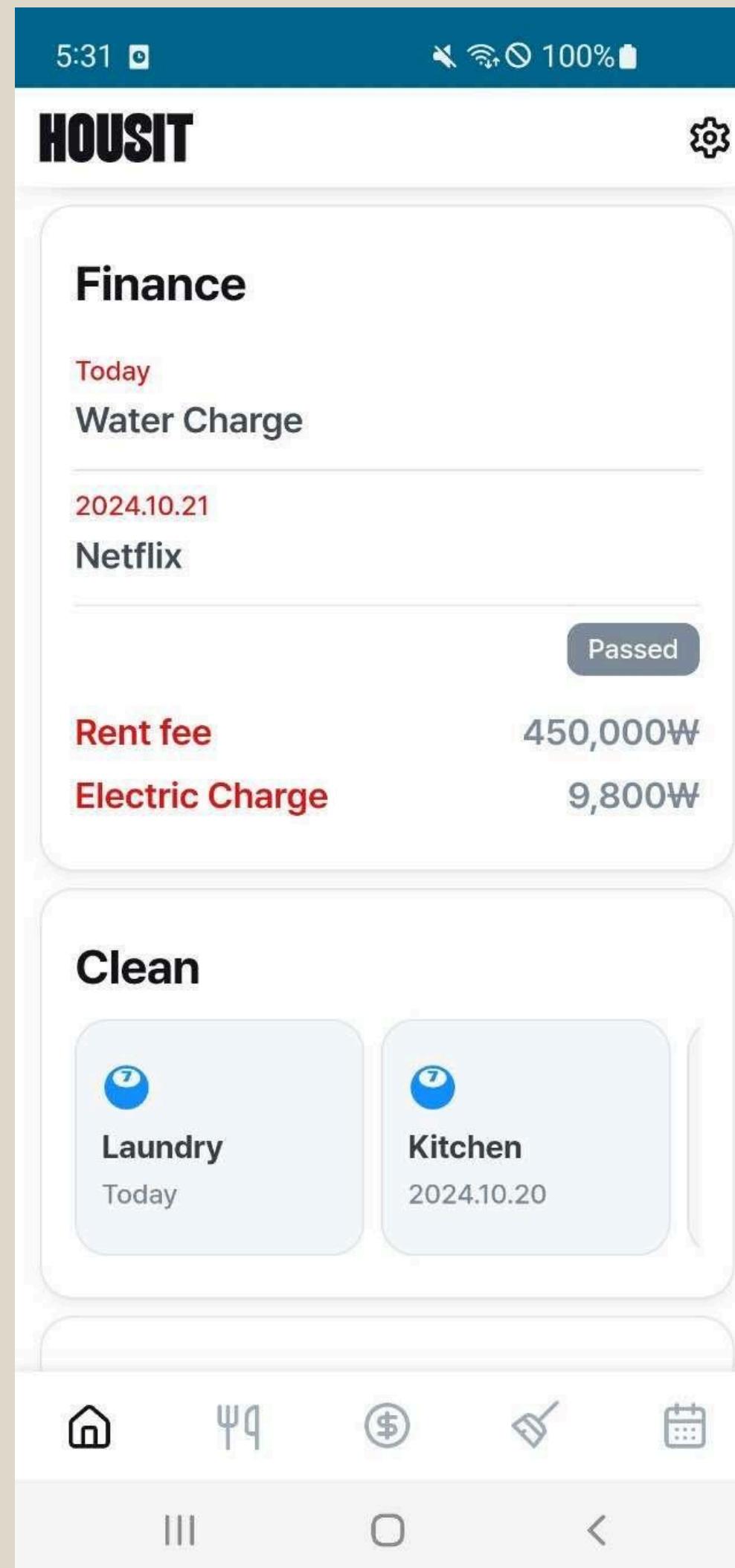
Title	Level	Weight	Font Size	Line Height	Description
Display		Bold	60px	72px	label
H1		Bold	48px	60px	label
H2		Bold	36px	45px	label
H3		Bold	24px	36px	label
H4		Bold	21px	31.5px	label

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.

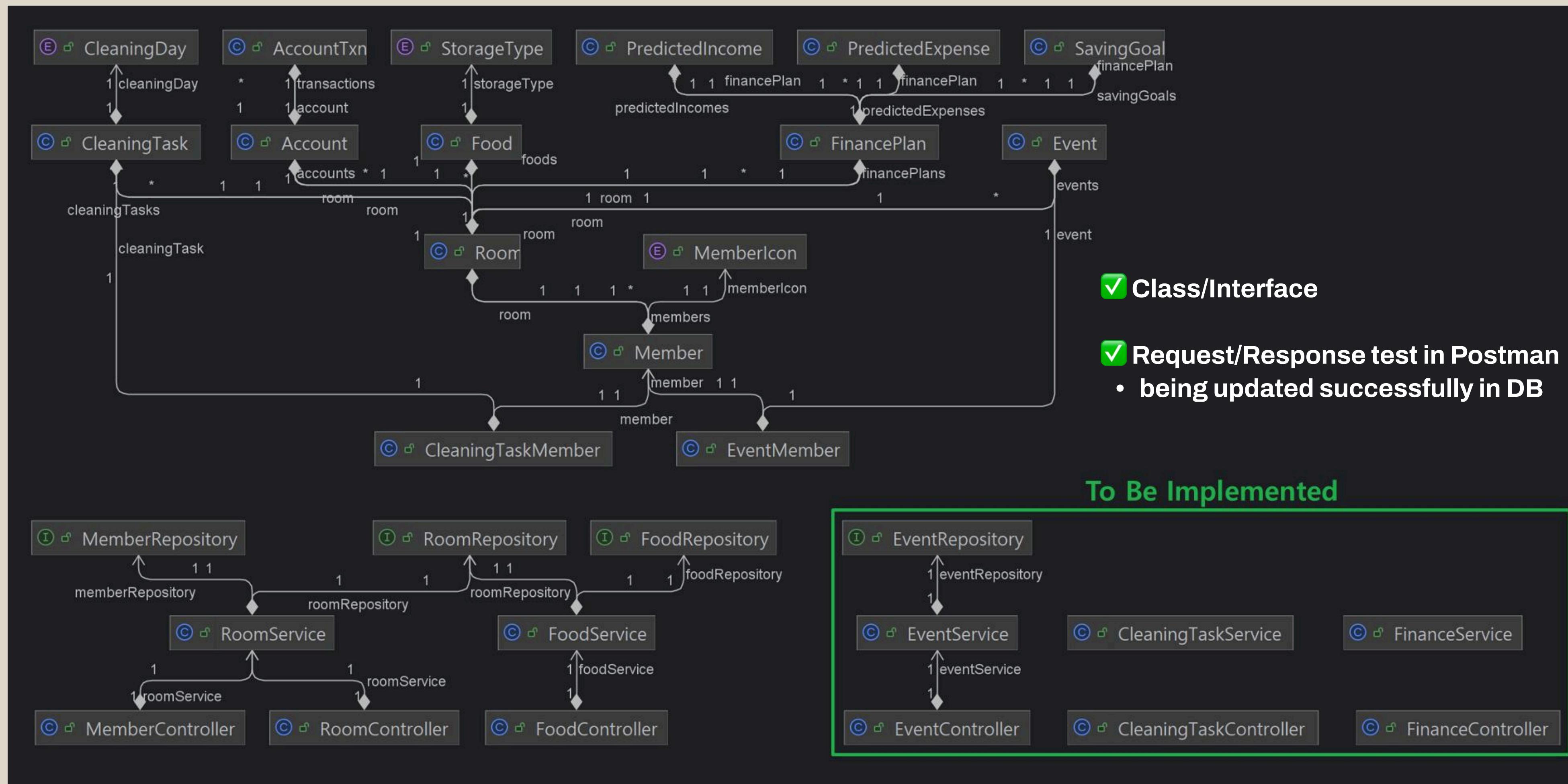
Trial 03(Solution)

: 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

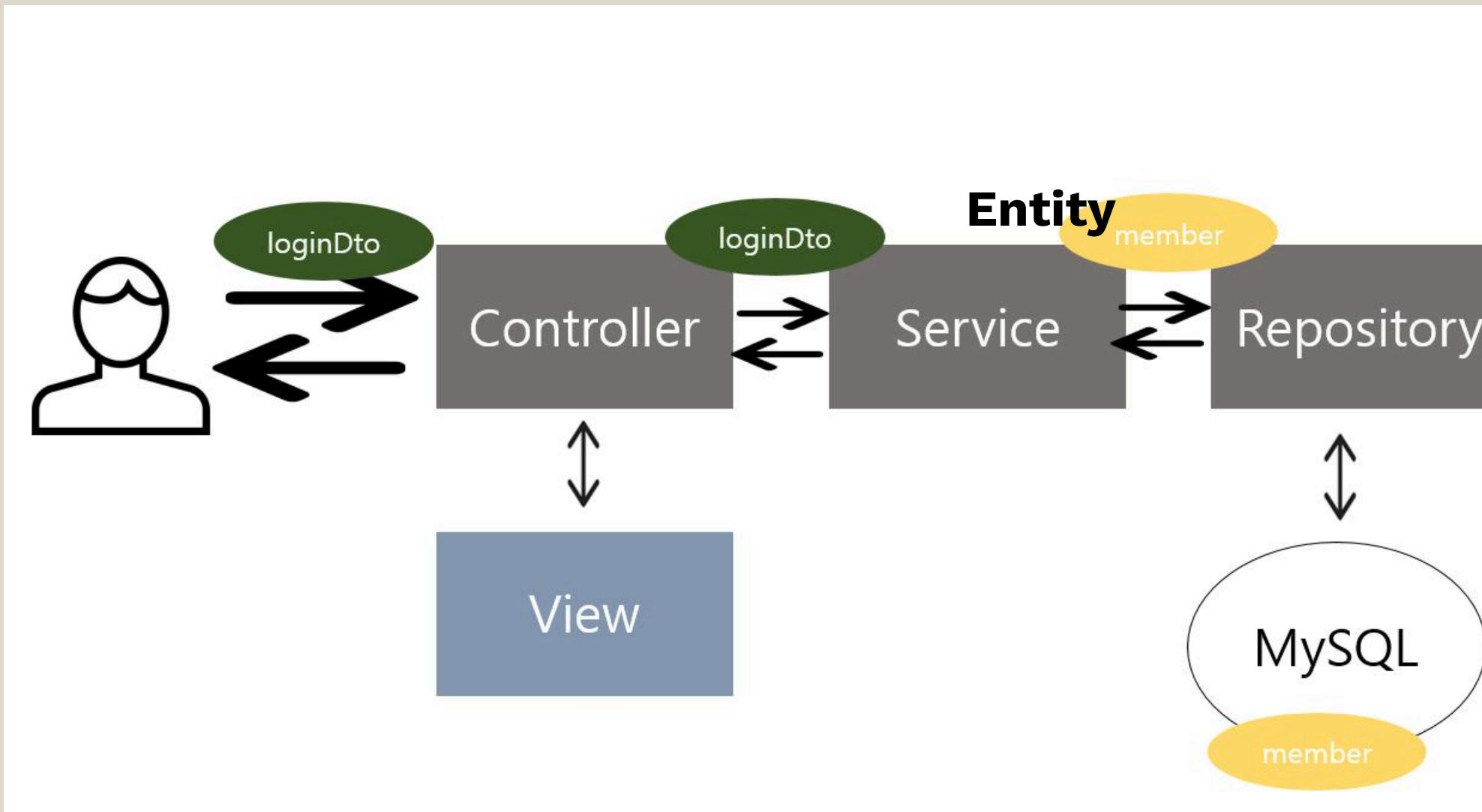
+ Consideration : Layer Dependencies

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

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

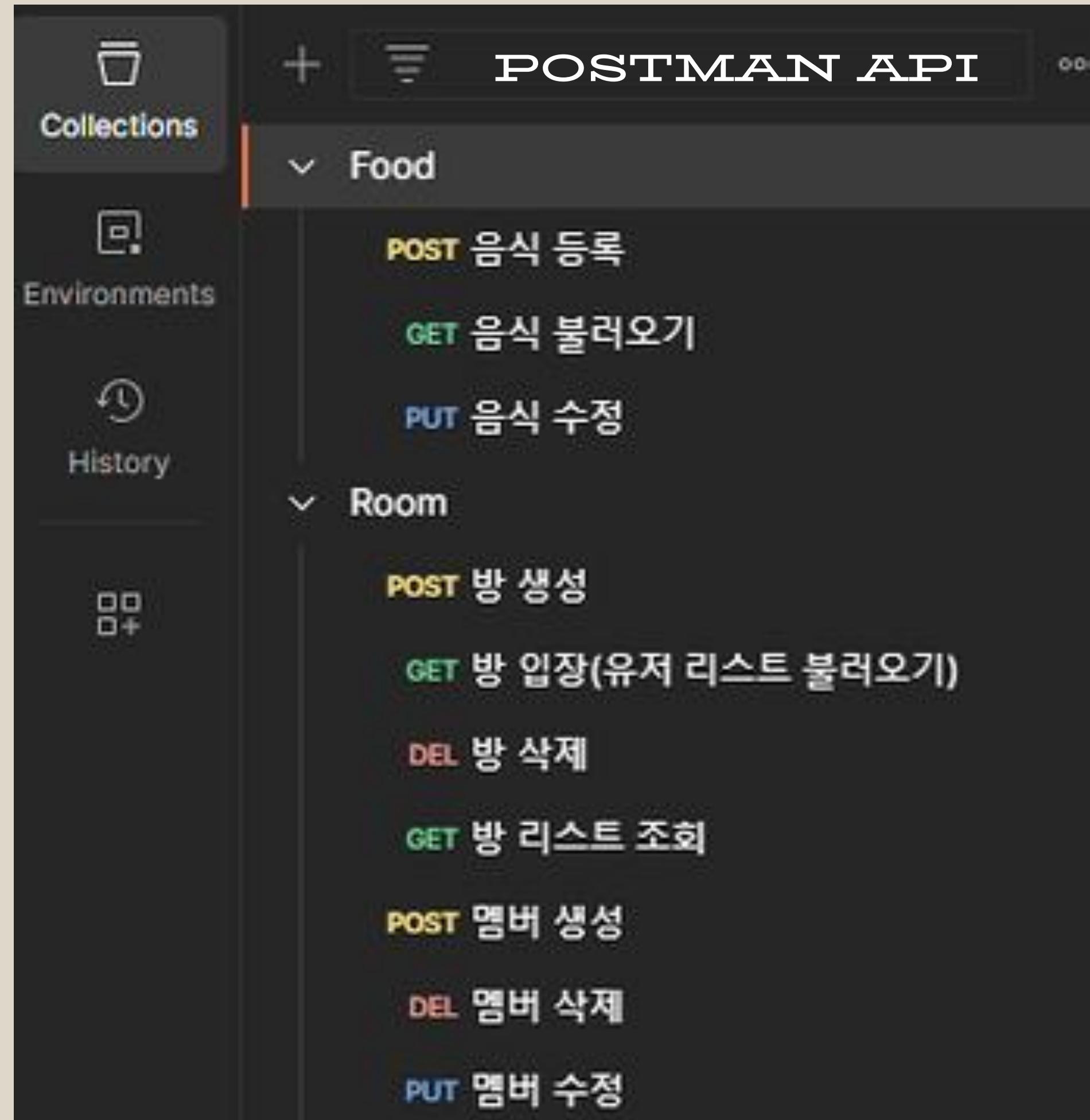
thereby **preemptively eliminating any potential repository layer dependencies**.

*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

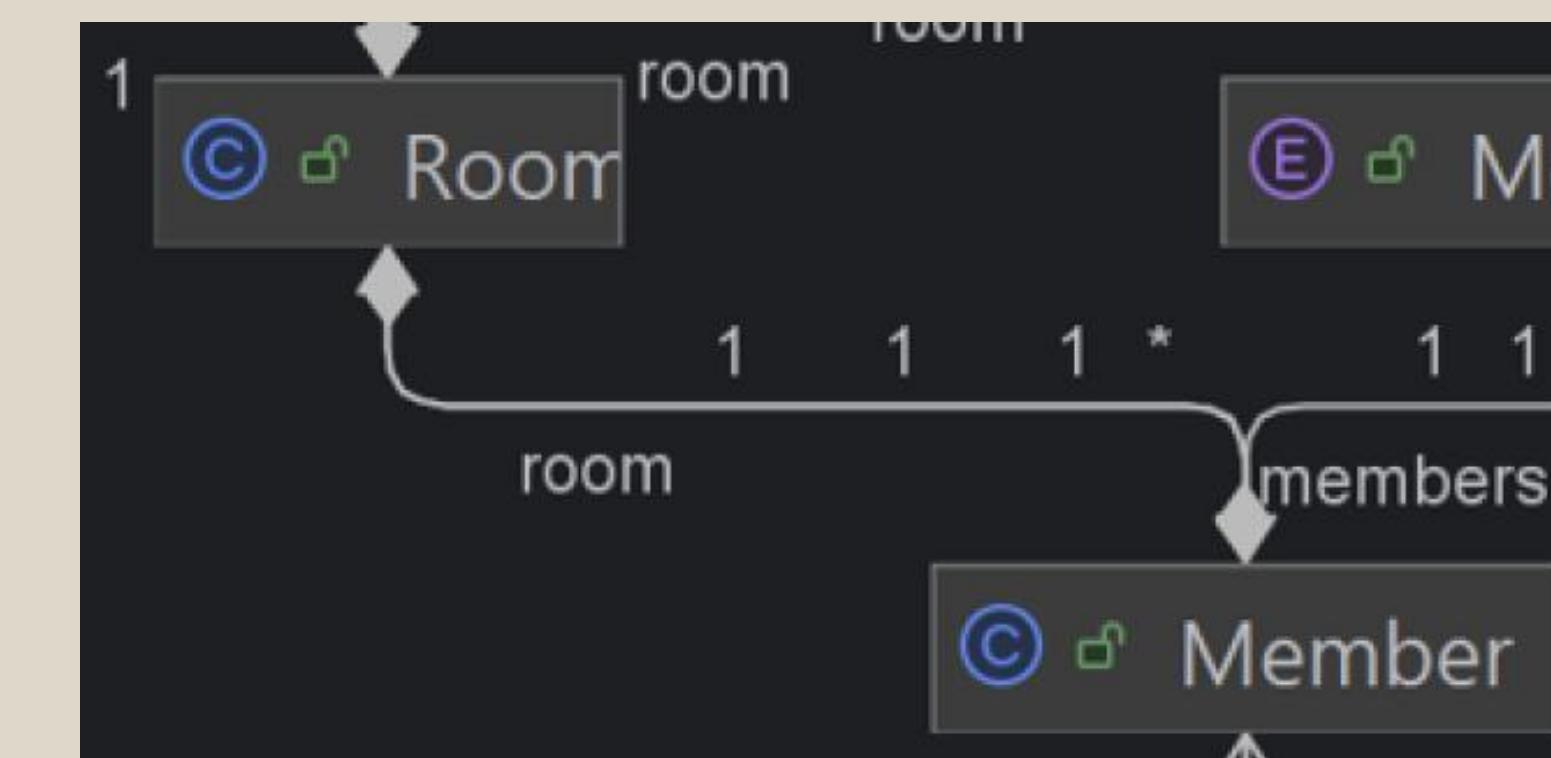
- Create a member
- Delete a member
- Modify a member

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

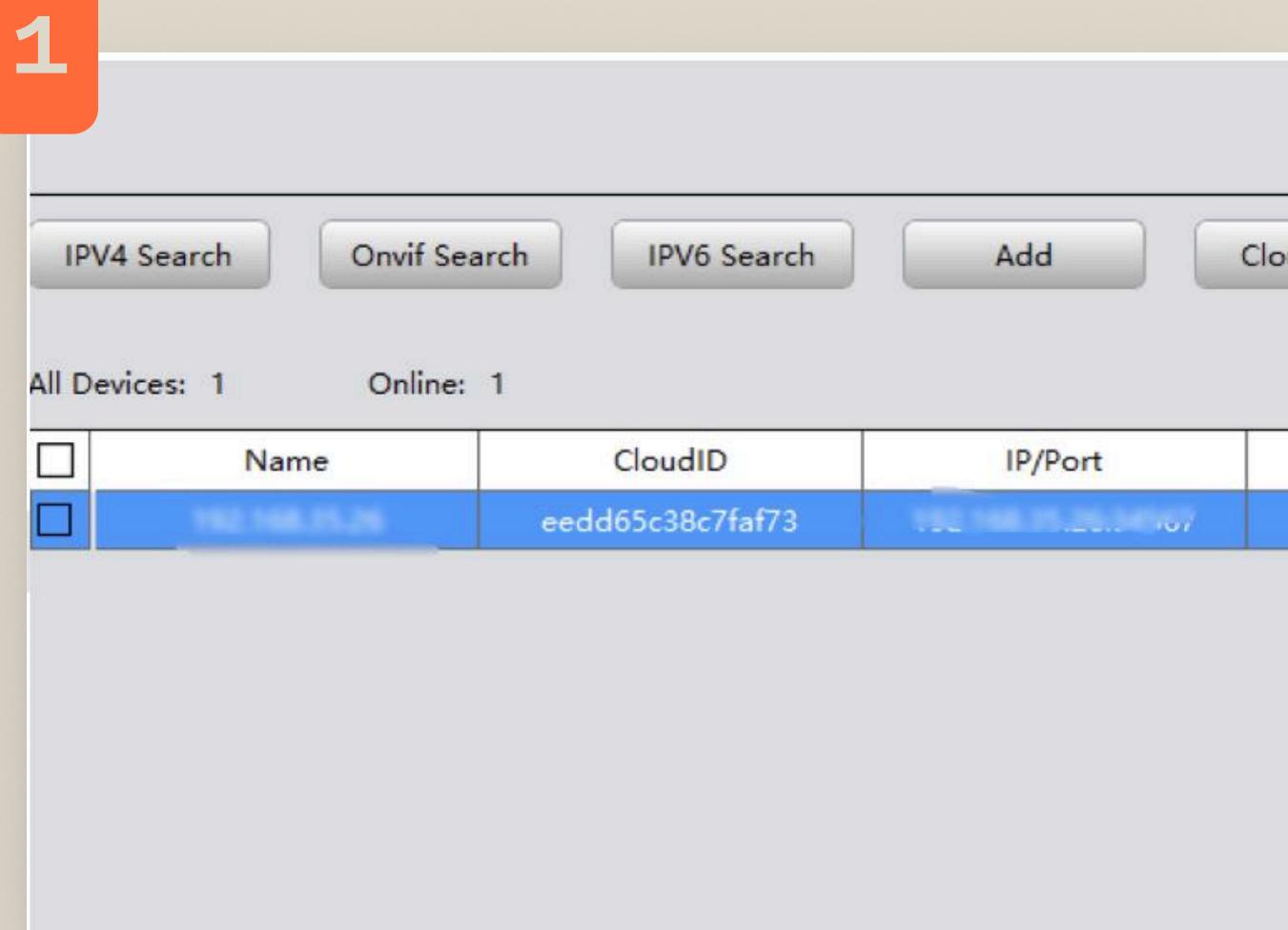
by preventing the toString method from printing mutually referencing objects.

IMPLEMENTATION : OCR FEATURE

1. Connection to IP camera

- Purpose: To get a video frame from ip camera

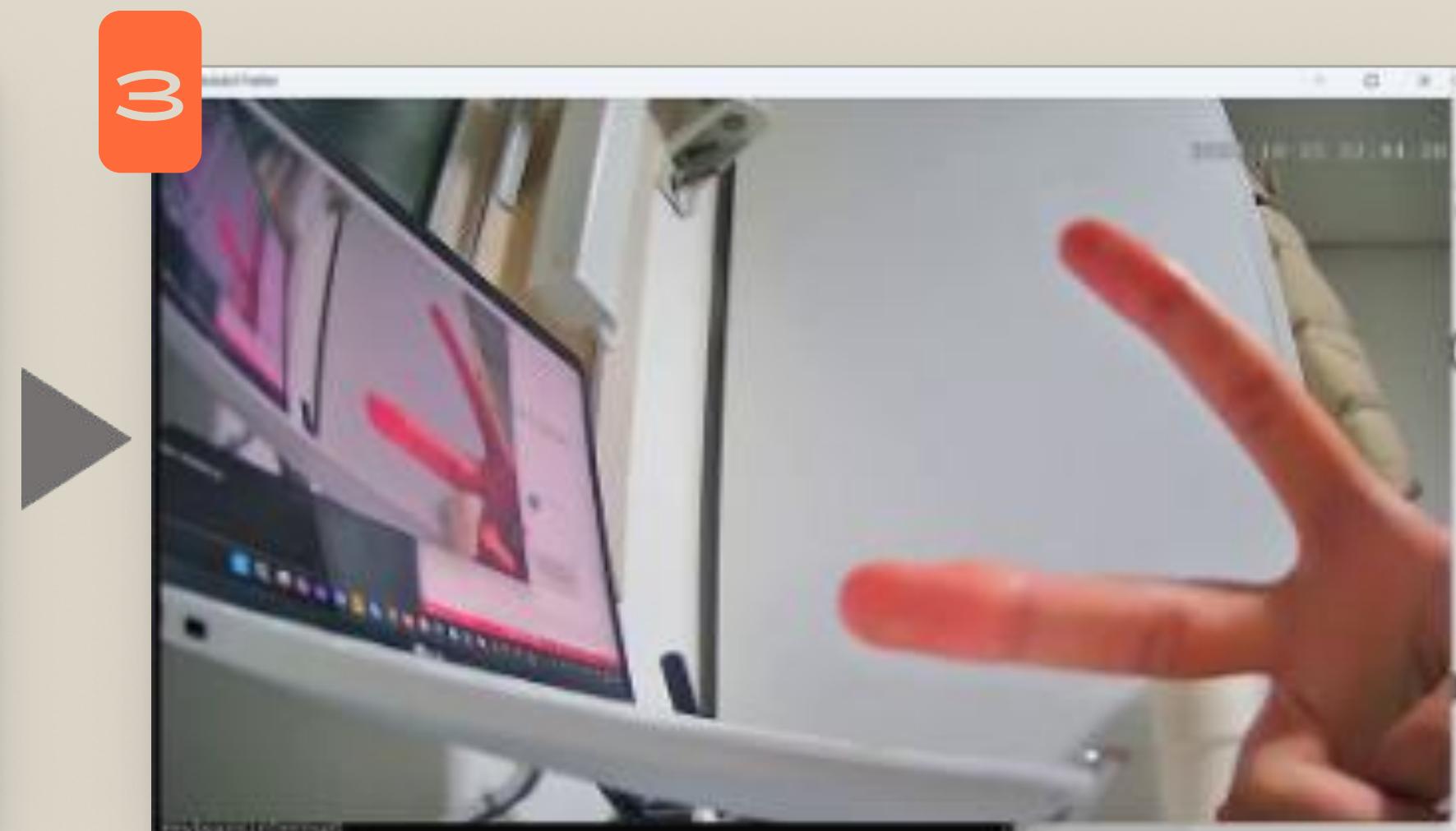
TRIAL



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

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	

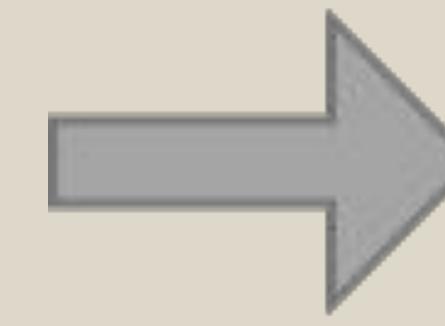
Testing a POST request with image files using Postman

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 ▾

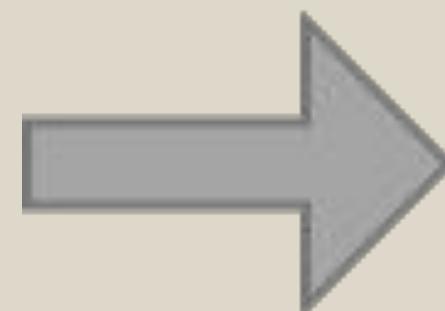
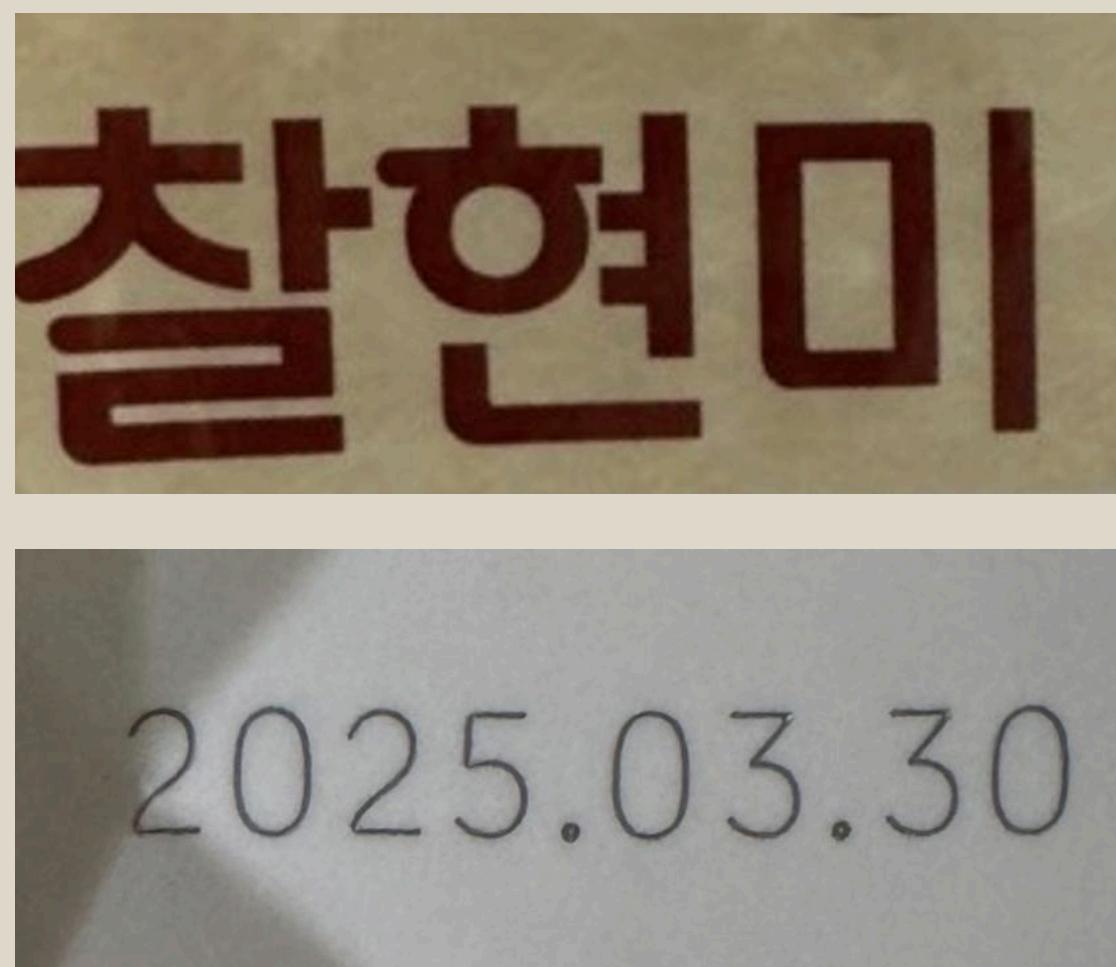
1 {
2 "brand_name": "젝_늦._얇쑥直辖市 `\" 데\n줄 쪘 기 8루 .|\n,... 7` = [뜯났 러
른 。'훗'\n06 주 사\n1 .3 오2 레 센\n《 땅 \\ {\\"}.\" .270 옷\n'놓.
칙._.,훗 5 꽉 구캐 칙._흡.몇박 .흡 흡_. 0 ..\n- 12267 .총 더\n내 . 다할
히 소 , 저\n{ 영밖 오 / 총 스 조 블 .\n, 6 은 아 주무 후 제스 6 . 발\n',
컨침\n5 소 아\n{은 오 2존 했 57100 1\n') 헤 822550 0 피\n{ . 늘 쓸\n290 .
232006 분 .\n으 굴 하 / 노 > 슬리\n0019 , 0 12087 8905\n\\)- : 도4 42\n'
짐` 다 미이 05063 0798\n6 웠 0 토 끼 힐\n나 아무 바 아 아 9 * 으 예 제\n7.
(100985 `빼켠놓, `털효밋찻원뺀금눌줄롯률흉앱웹훔죠`총\n깃 (에 내 베과 `'
00\n뿌 . 00000\n있 290 바 이20이 은 네 나 위 갔 델 드 라 이시) 이 이 니 백
이 난 2 반\n. 개 86 3 매 인트 .\n006 퓨 사 16299 에 나 220 이 2시 000 바
힘 00 바 비 이0무 이 나 7\n르 땀넨 기 3 바 눈 자 비 버 나 파 나 0 바 나이 가
안 바 이\n~ 난 와 시 긴 강 브 베 듬 아비 9446\n: 0리 수이 수 니 시 빈 가 아
아 지에 다 가\n: 6 47 랭풀흑을호쿰\\흐 , 즐\\흔을찻을쫓풀을앓습.
'젠흔률을끓낮듀 뜻 흡총.'\\몇뺏술을효\\n' 쇼 . 020006 이 아거 26 나 아
스 하 오아 쟁 아아\n0 나이 40이 살아 아아 22\n, 662 할아 시기 수 아간\n547:2
재), 육 198 으 임 '\$*빼 가 있시\n2)7)] 퀼 '켠(능'흔푸'요 62 .. 『..쐐\\
\n통。* 품확" 총`\\"*딜혈영 , :\n86287300096 , 무시 00\n7 20066 매 "
\n줄문호`/. 짚음됨/책, 」 설 : 류 > ",
3 "expiration_date": null
4 }

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 ↻

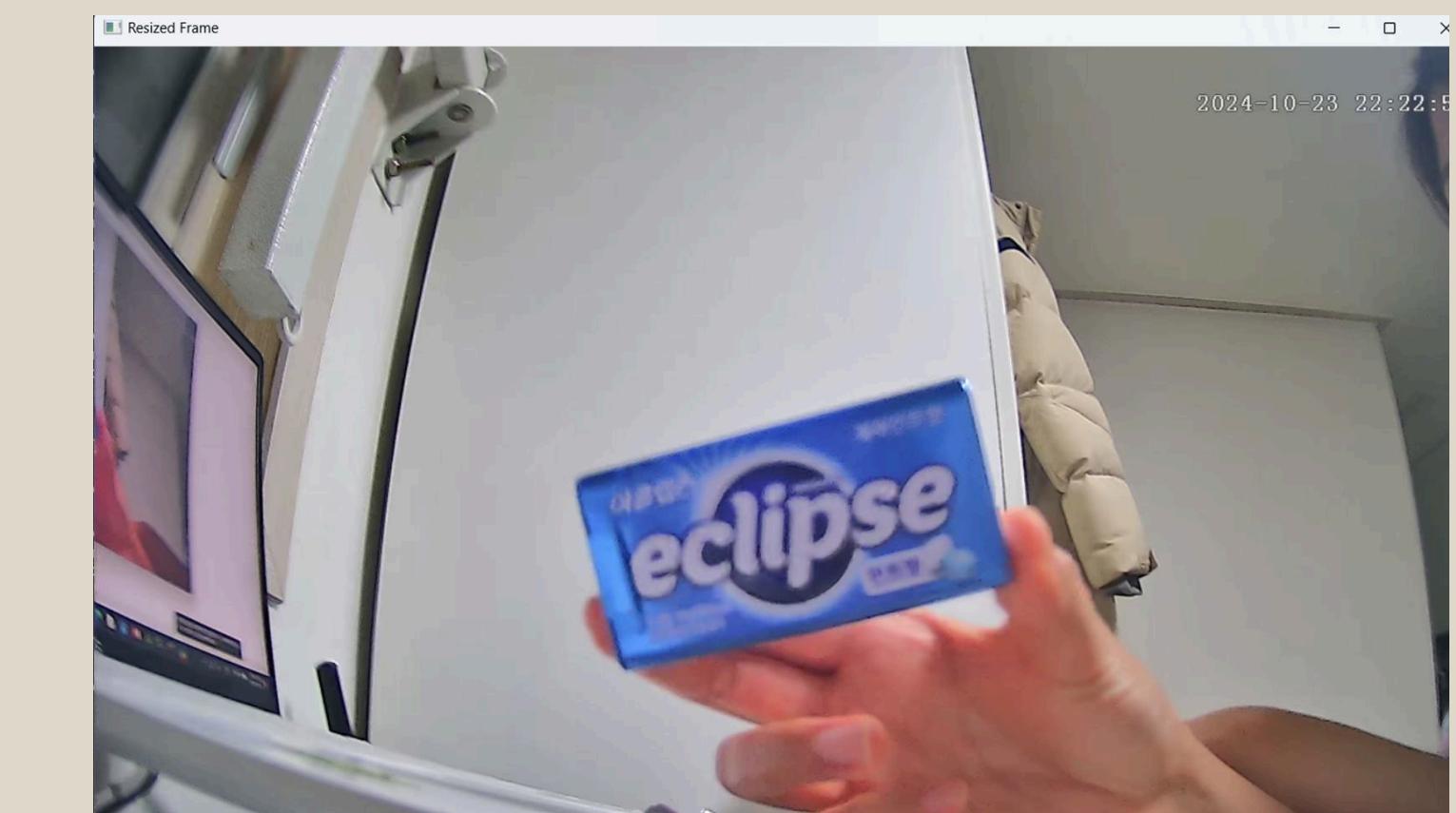
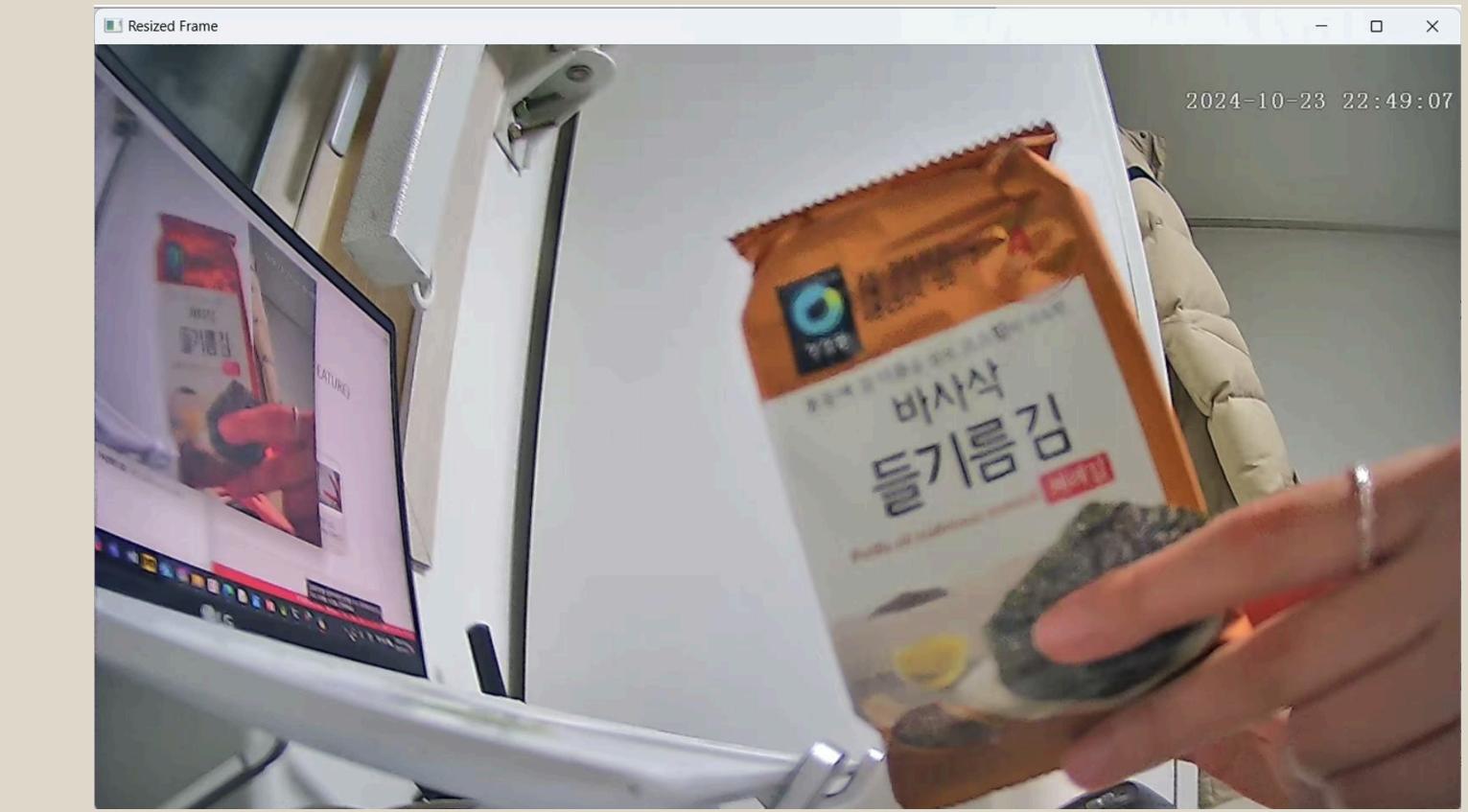
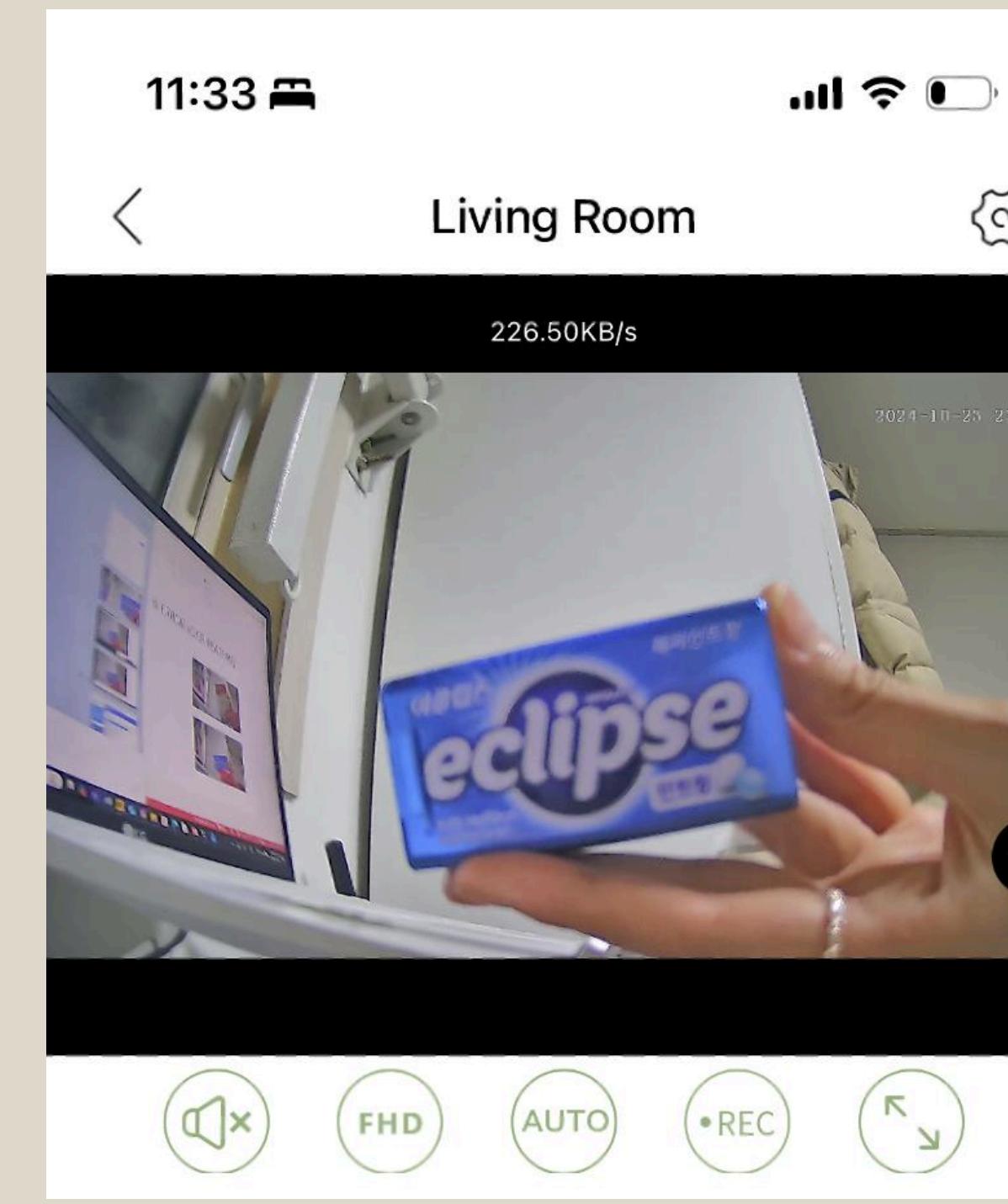
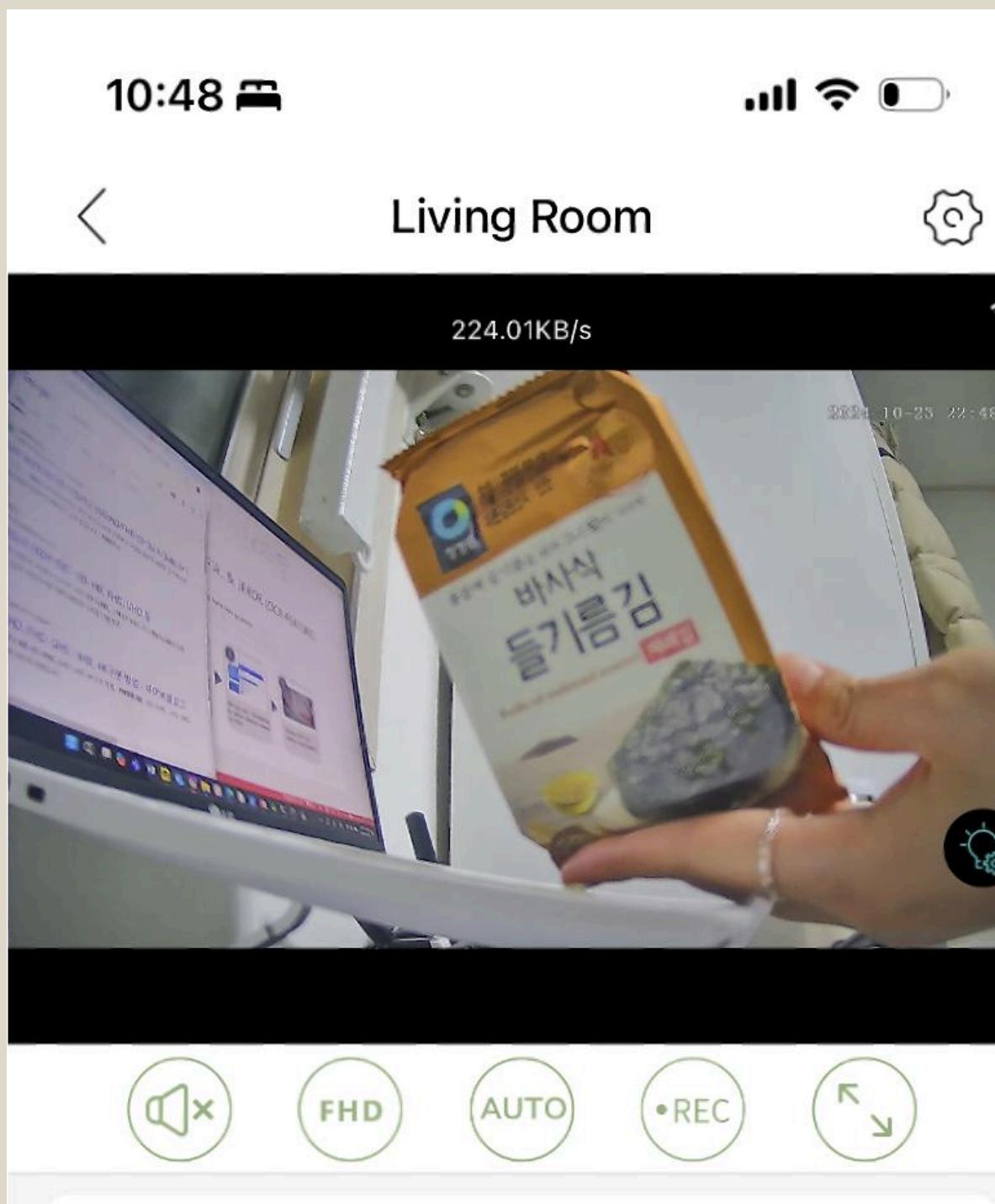
```
1 {  
2   "brand_name": "찰 현 미",  
3   "expiration_date": "025.02.50"  
4 }
```

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>

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

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

"brand_name": "'.., 놀장 ○ | 틀] 소스 후 빙 축 르 /\nL 8 6 뜨 기 밥 :...\n\n안 뚜 기 , 근데\n/ 6 ~:。 3갠 . ,\n|\n| 겨 예\n\n호 . 오 봉 가\n\n차 혀 060 9\n\n251 0 /\n25 해 * 거송\n\n테 되 십\n\n1108 60060 민 노 이 1044045 800\\ 비 ~ 거 도훈' <_표:\n\n0 , '휙 , { 길\n\n100010 늘\n\n60 <\n\n2/ 사 잘면 67 제언",
"expiration_date": null

```
<Gray scale & binary & dend
```

```
        "brand_name": "다1 아 으 남 ) /\n\n6 . 6 뚜 기발 -\"\\n\\n조이 제 촛알놓*\n          17\\n\\n: (혹___.음`.빌 : " 게\\n\\n1 ( 으 노 술 다\\n、 을 사 잡\\n\\n글 순\n          이다\\n메 ~ 시 지\\n\\nπ π 0061000460 니 6 든 601048 80 ○ 6 뜹 쵸는\\n% 니\n          191\\n\\n납 설 의 100 * ? /\n2/ 사 잡언 ~ 。",\n        "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!