Object Oriented Programming

Project1 Report

Prob # 1: IIKH C ++ Program

Object Oriented Programming Class 01

Mon 1 / Wed 1,2

Professor : Bong-Soo Sohn

< Team 02 >

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(a) project title, list of team members, presentation speaker name, and brief project description (summary)

1) Project title

: Interactive Intelligent Kitchen Helper

2) List of team member

: 20193057 김승아, 20190323 배인경(Leader), 20191673 이주연, 20195999 이채현, 20195812 황현수

: All members belong to the Department of Computer Science & Engineering 19

3) Presentation speaker name

: 20193057 김승아, 20190323 배인경, 20191673 이주연

4) Brief project description

: Recipe function

- ADD, EDIT and DELETE functions have been implemented for the name, ingredients and description of the recipe.
- The recipe can be reused because it can be saved as a '.txt' file. In other words, this txt file is used for database purposes.

: Plan function

- The plan function is associated with the recipe function.
- Select foods from the recipe database, and set the number of people to add a Meal plan.
- You can register multiple Meal plans on a single date.
- Print out the list of necessary ingredients for the plans you have registered.

(b) How to compile and execute. system requirement for compilation and execution

1. Prepare the Microsoft Visual Studio 2019 environment.

2. Open the source code file that you want to execute.
3. Visual Studio IDE works compilation and execution at once when pressing run(ctrl + F5)

▶ System requirement(based on Visual Studio 2019)

→ HW

: 2GB RAM, Recommend 1.8 GHz quad-core processor or above

→ OS (64-bit recommended,)

: Windows 7 service pack 1 / Windows 8.1 / Windows 10 (version 1703 or above)

(c) description on functionality that was implemented in your SW system.

1) Main Menu

: In the main menu, user can select the various function implemented in program.

1) Showing All Recipe

: User can view a list of all recipes from the database.

2) Browsing Recipe

: User can browse the recipe by enter the keyword. If the keyword matches with recipe name or ingredients, program will be print out all matched recipes. Of course, the program print the recipes by distinguishing whether it matches the recipe's name or the recipe's ingredients.

3) Editing Recipe

: If the user selects one recipe through the browsing recipe function, the user can edit the recipe. Options for editing the recipe are as follows.

- ▶ Setting recipe name
- ▶ Setting recipe cooking time
- ▶ Adding a recipe ingredient
- ▶ Removing a recipe ingredient
- ▶ Editing a recipe ingredient amount
- ▶ Setting a Recipe description
- ▶ Delete recipe

4) Adding Recipe

: User can add new recipes to the database by enter the components of recipe.

5) Showing All Plan

: User can view a list of meal plans they designed.

6) Adding Plan

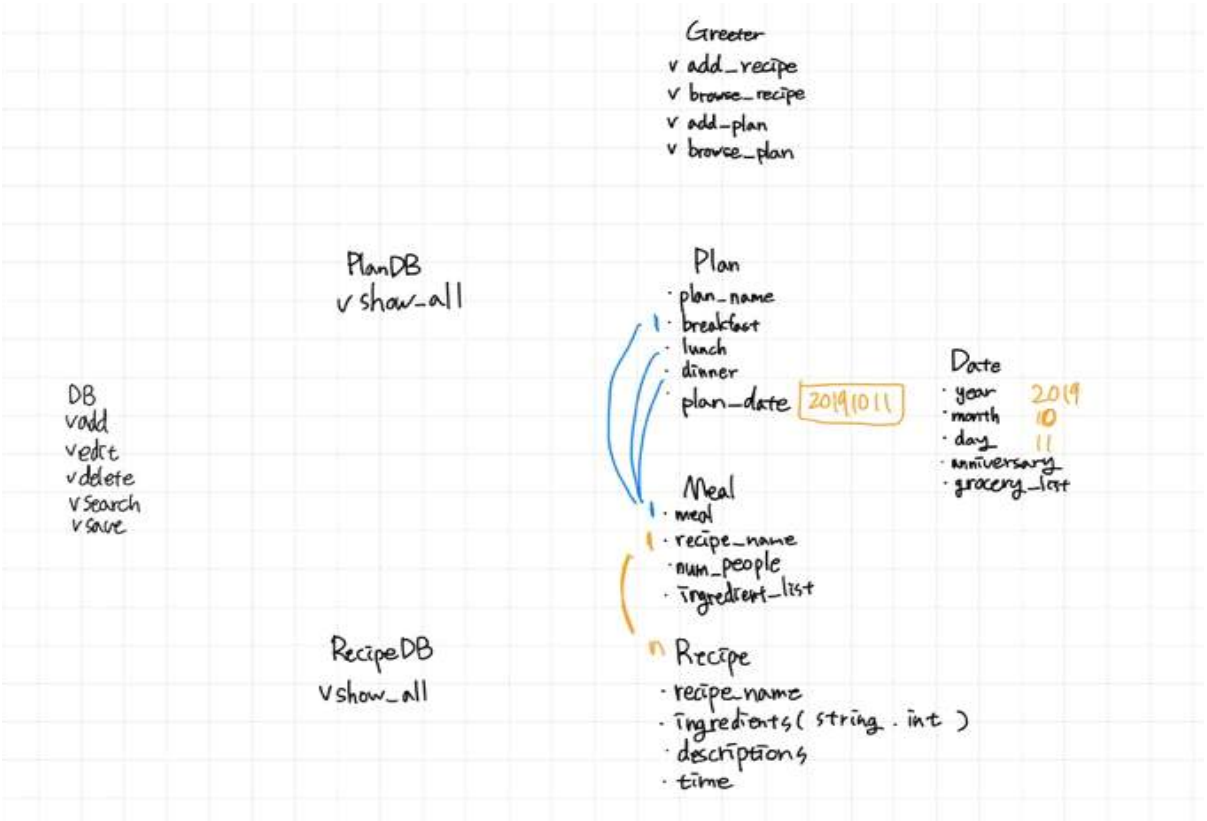
: User can add new meal plans by enter the components of meal plan.

7) Printing Grocery List

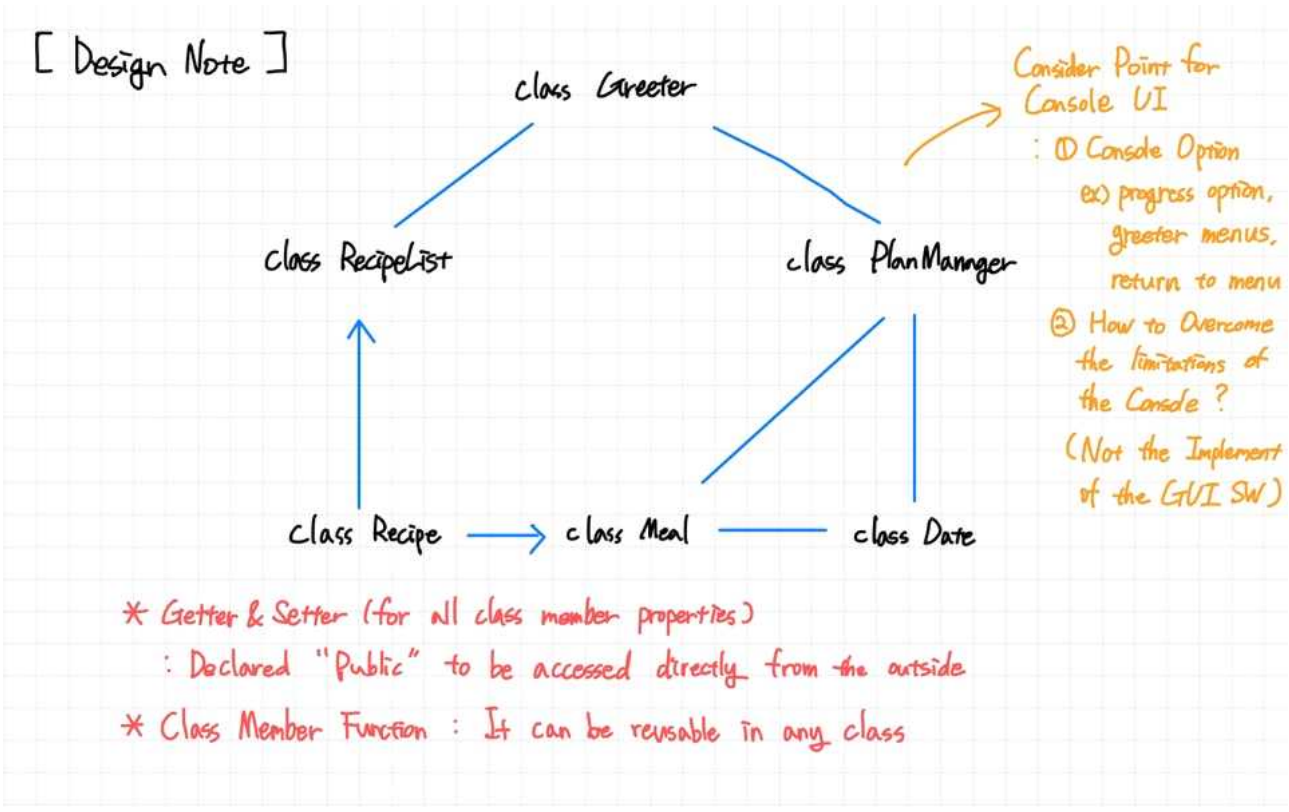
: Users can view a list of grocery list for their meal plan list in one day unit. The grocery list are automatically scaled by the number of people user set.

(d) how you implemented (important implementation issues)

1) Initial Design Note

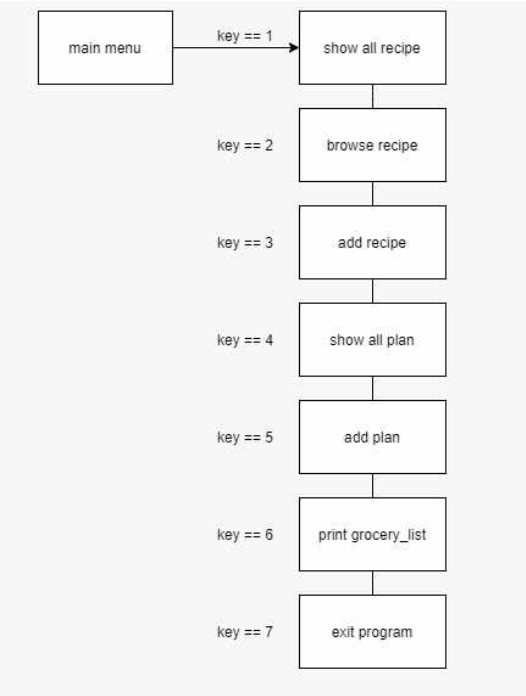


2) Final Design Note

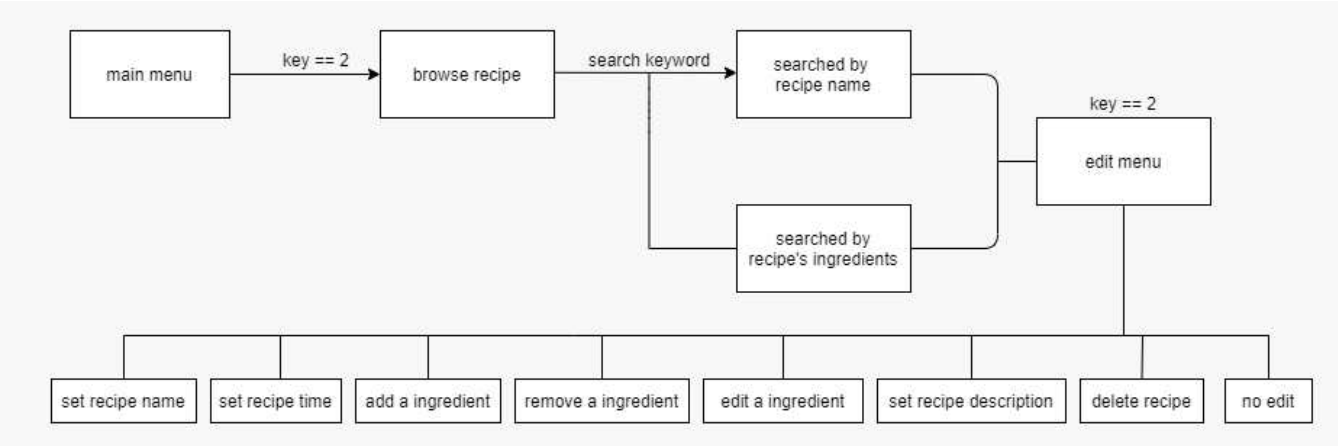


3) Console UI Design Map (Confirm console window options to implement)

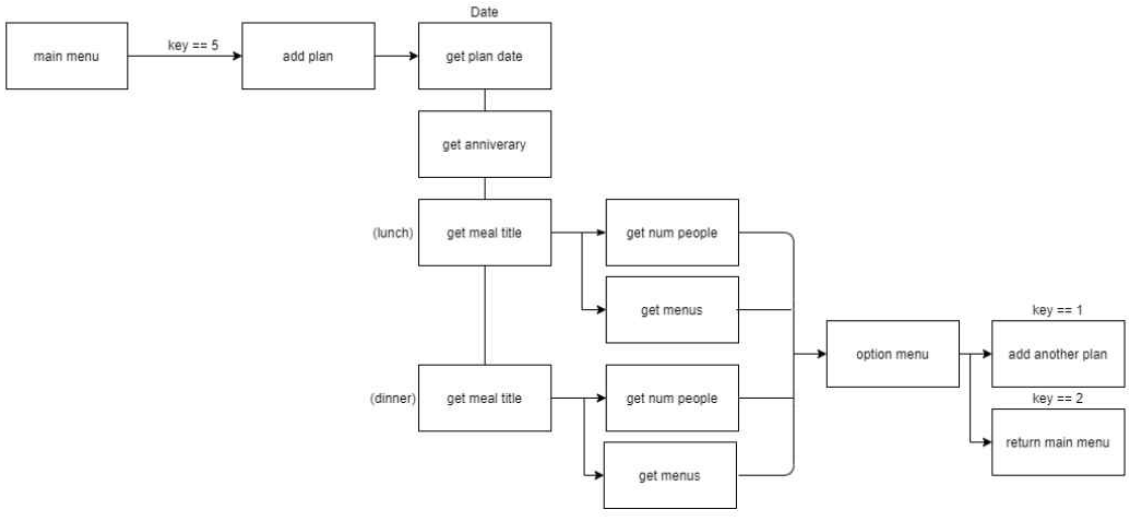
: Initial Console Screen



: Option 2 -> 'Brwose Recipe' Console Screen



: Option 5 -> 'Add Plan' Console Screen



4) About Implementation Issues

① Consider what features the IKKH program should offer and decide on the options in the console UI to implement them

: Refer to page 5 of the report_Console UI Design Map

② Think about the Class, member Properties, member Functions required by each IIKH features, and Consider things that will be object-oriented and 'public' declared for reusable functions that are called several times.

: Refer to page 4 of the report_Design Note (Initial ver & Final ver)

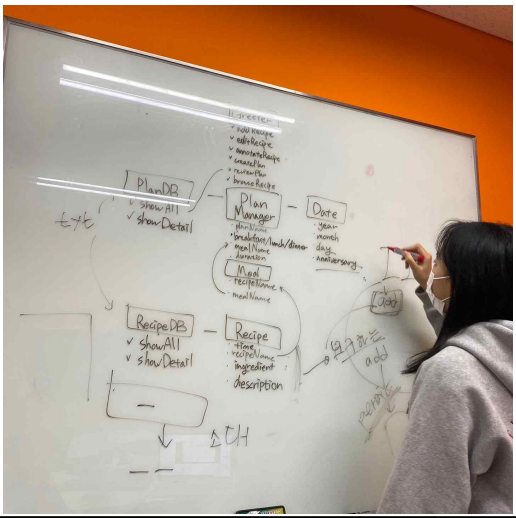
③ Role Distribution for Progamming code

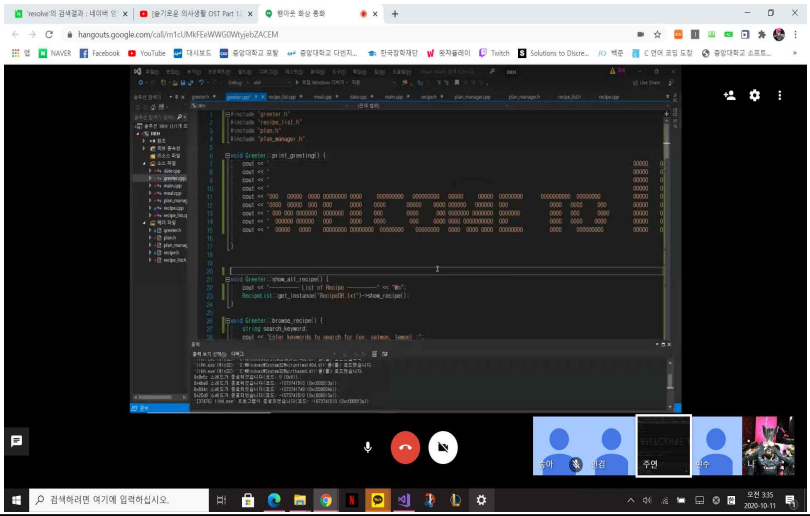
: The roles are largely divided into 'recipe' and 'plan'.

: Code review through face-to-face and video conferencing.

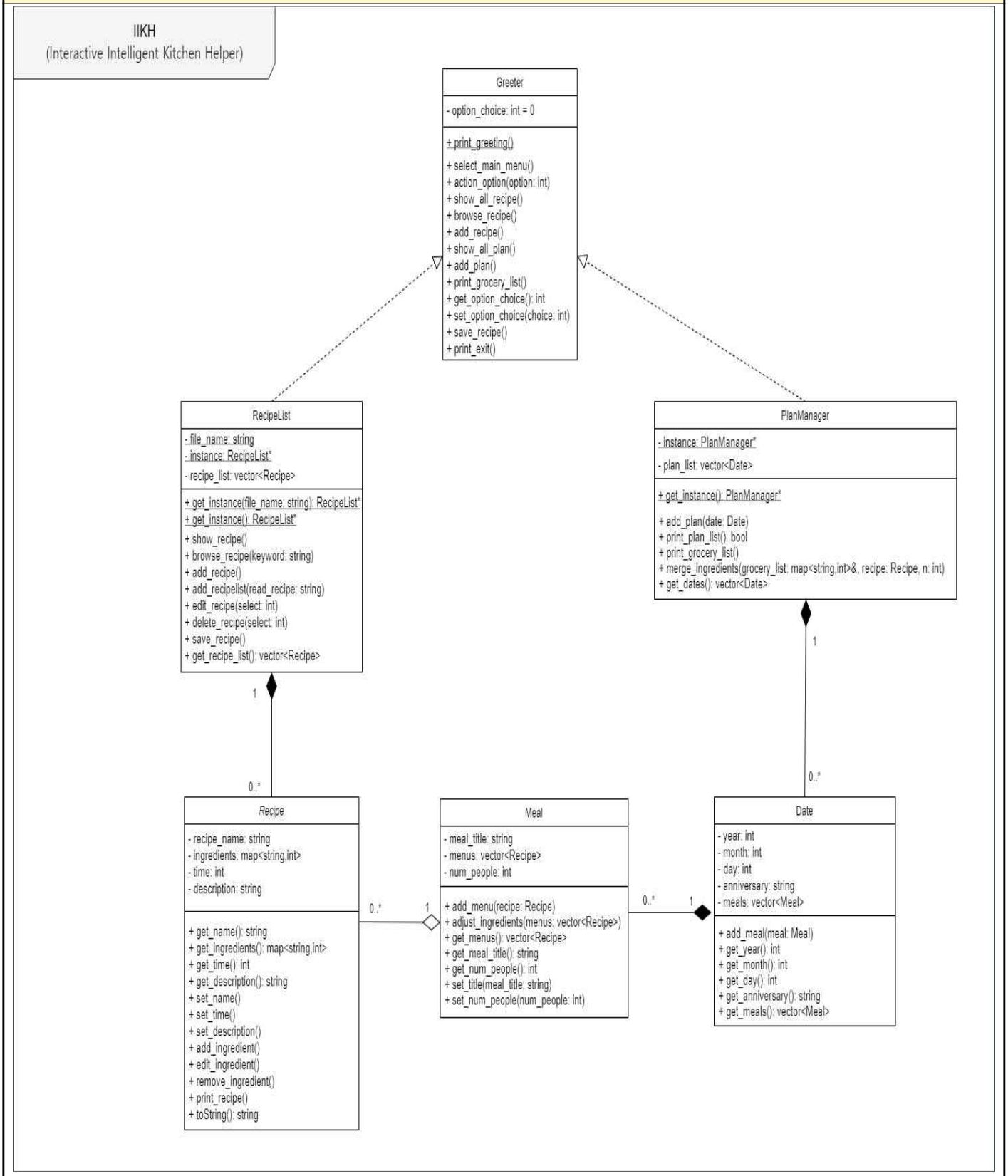
: Write code with git-hub for efficiency

5) Meeting (With Photo)

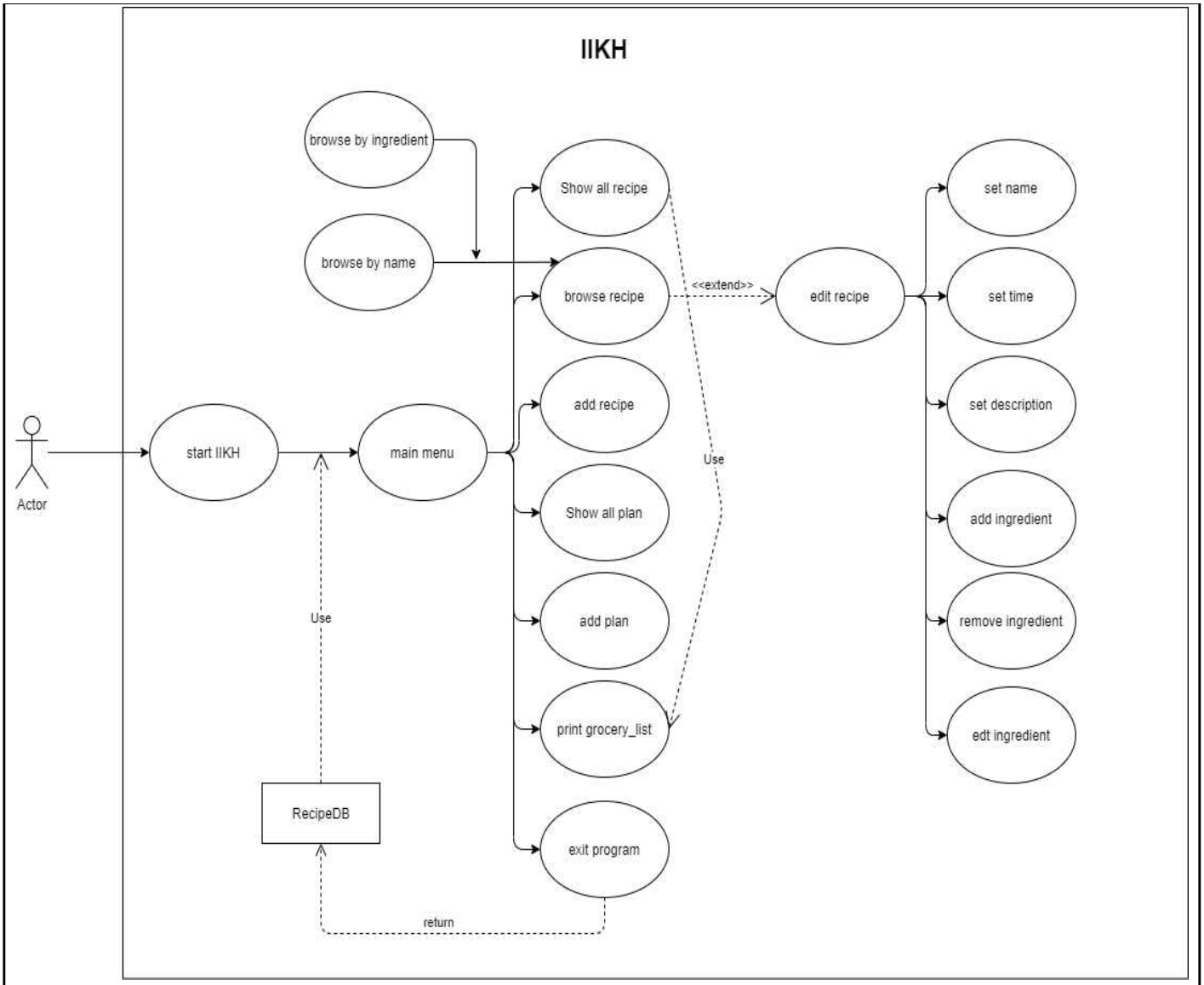




class diagram and use-case diagram, in your SW design result.)



▲ Class Diagram

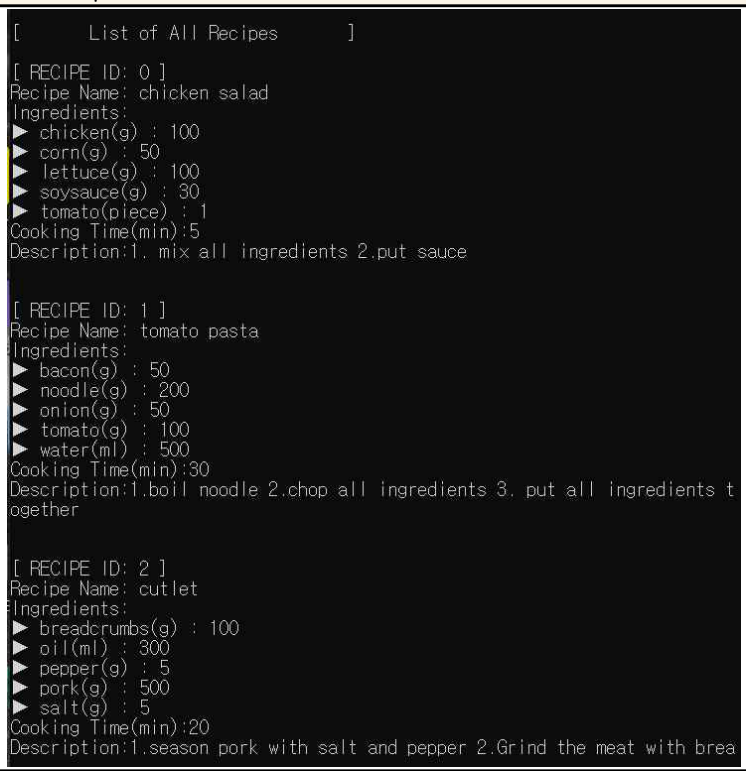


▲ Use Case Diagram

show that each function of the SW system is working correctly.

1. first screen

2. select 'Show All Recipe' menu



3. selcet ‘Browse Recipe’ menu

```
> Select Option Number : 2

> Enter keywords to search for (ex. salmon, lemon) :chicken

------------------------------------
    Searching by recipe's name
------------------------------------
[ RECIPE ID: 0 ]
Recipe Name: chicken salad
Ingredients:
▶ chicken(g) : 100
▶ corn(g) : 50
▶ lettuce(g) : 100
▶ soysauce(g) : 30
▶ tomato(piece) : 1
Cooking Time(min):5
Description:1. mix all ingredients 2.put sauce


------------------------------------
 Searching by recipe's ingrediants
------------------------------------


------ Option  Menu ------
| 1. More Browsing       |
| 2. Edit recipe         |
| 3. Return Main Menu    |
--------------------------
> Select Option Number :
```

3-2. If there is no recipe

```
> Select Option Number : 2

> Enter keywords to search for (ex. salmon, lemon) :chicken

------------------------------------
    Searching by recipe's name
------------------------------------


------------------------------------
 Searching by recipe's ingrediants
------------------------------------

SORRY:(
There is no recipe for that keyword.
------ Option  Menu ------
| 1. Return Main Menu    |
--------------------------
> Select Option Number :
```

4-1. select 'Edit recipe' in option menu

```
------ Option  Menu ------
| 1. More Browsing       |
| 2. Edit recipe         |
| 3. Return Main Menu    |
--------------------------

> Select Option Number : 2
> Choose Recipe ID: 0


--------- Edit Menu ---------
| 1. Set recipe name        |
| 2. Set recipe time        |
| 3. Add a ingredient       |
| 4. remove a ingredient    |
| 5. edit a ingredient      |
| 6. Set recipe description |
| 7. Delete Recipe          |
| 8. No Edit                |
-----------------------------

> Select Edit Number :
```

4-2. set recipe name

```
> Select Edit Number : 1

> Enter edited_recipe name: chicken salad_edi

---------------------------
        Edit Success
---------------------------
Recipe Name: chicken salad_edit
Ingredients:
▶ chicken(g) : 100
▶ corn(g) : 50
▶ lettuce(g) : 100
▶ soysauce(g) : 30
▶ tomato(piece) : 1
Cooking Time(min):5
Description:1. mix all ingredients 2.put sauc
```

4-3. set recipe time

```
> Select Edit Number : 2

> Enter edited_recipe time(minute): 10

---------------------------
        Edit Success
---------------------------
Recipe Name: chicken salad_edit
Ingredients:
▶ chicken(g) : 100
▶ corn(g) : 50
▶ lettuce(g) : 100
▶ soysauce(g) : 30
▶ tomato(piece) : 1
Cooking Time(min):10
Description:1. mix all ingredients 2.put sauc
```

4-4. set recipe delete

```
> Select Edit Number : 7


-----------------------------
  Delete Success
-----------------------------
```

5. select 'Add recipe' in option menu

```
> Select Option Number : 3

[       Add New Recipe       ]
> Recipe name : Ice americano
> The number of ingredients used in this recipe : 3
 1) Ingredient name. Input like following format-> "ex)egg(개)" : coffee(g)
    Ingredient amount (Only Input Integer for amount) : 50

 2) Ingredient name. Input like following format-> "ex)egg(개)" : water(ml)
    Ingredient amount (Only Input Integer for amount) : 100

 3) Ingredient name. Input like following format-> "ex)egg(개)" : ice(g)
    Ingredient amount (Only Input Integer for amount) : 50

> Cooking Time Duration (Only Input Integer for minutes) : 5

 Let's Describe "How to Cook?"
> The number of Recipe description : 3
1)grind the coffee
2)boiled water and put coffee in water
3)put ice in water

----------------------------
 Add Recipe Success
```

6. select 'Show All Plan' in option menu

```
-------- Main Menu --------
| 1. Show All Recipe      |
| 2. Browse Recipe        |
| 3. Add Recipe           |
| 4. Show All Plan        |
| 5. Add Plan             |
| 6. Print Grocery_List   |
| 7. Exit Program         |
---------------------------
> Select Option Number : 4




[       List of Plan       ]
You don't have any plan!
------ Option  Menu ------
| 1. Return Main Menu    |
---------------------------
> Select Option Number :
```

There is no meal plan at first.

7. select 'Add Plan' in option menu

```
-------- Main Menu --------
| 1. Show All Recipe      |
| 2. Browse Recipe        |
| 3. Add Recipe           |
| 4. Show All Plan        |
| 5. Add Plan             |
| 6. Print Grocery_List   |
| 7. Exit Program         |
---------------------------
> Select Option Number : 5
 Let's make plan
> Enter date of plan (ex. 2020-04-26) : 2020-11-01
> Write anniversary annotation : HyunSu B-day

> Enter the number how many meals you want to plan : 2

================================================================

 1 ) Enter the title of Meal : lunch
    -> How many people do you eat with? : 3
    -> Enter the number how many menus you want to plan : 2

[       List of All Recipes       ]
```

put date, anniversary annotation, the number of meals. Then put each meal title, people with, the number of menu and select recipe from recipe database.

7-1. user selected recipe 1and 2 for lunch in 2020-11-01.

```
-> Let's select menu by choose ID of menu_1 : 1
-> Let's select menu by choose ID of menu_2 : 2

================================================================
```

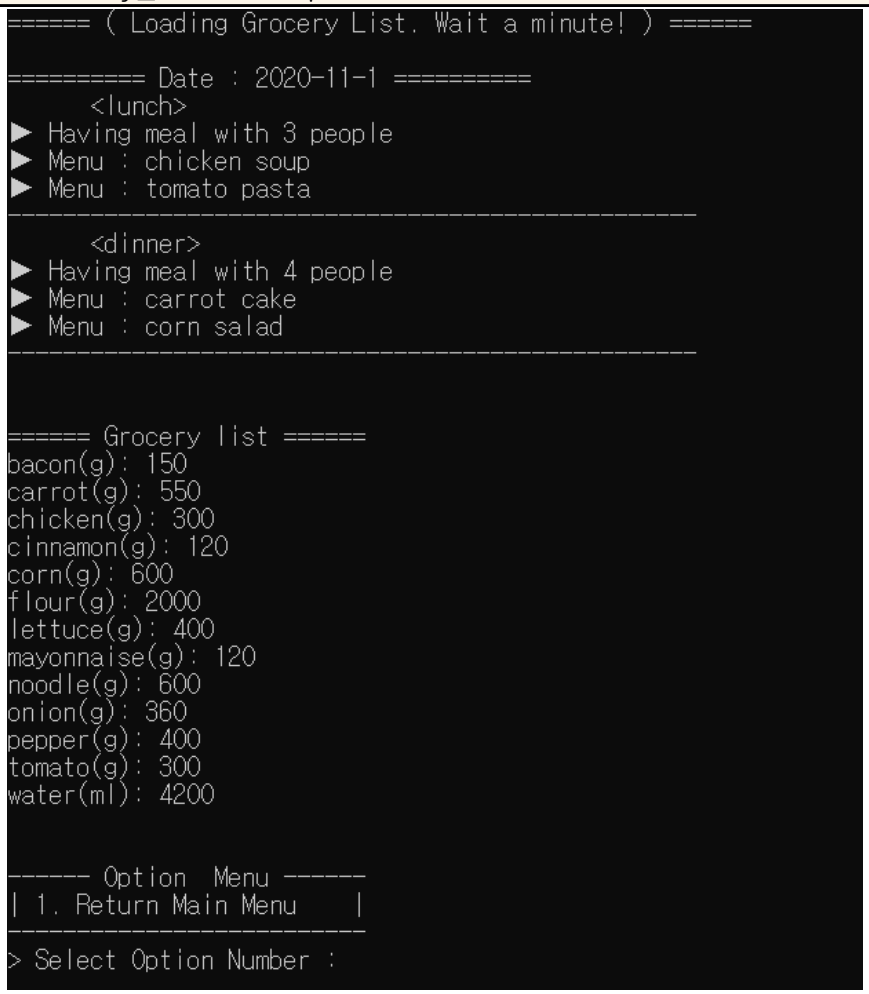
7-2. repeat the same for another meal.

```
 2 ) Enter the title of Meal : dinner
    -> How many people do you eat with? : 4
    -> Enter the number how many menus you want to plan : 2

[       List of All Recipes       ]


-> Let's select menu by choose ID of menu_1 : 4
-> Let's select menu by choose ID of menu_2 : 5


------ Option  Menu ------
| 1. Add another plan    |
| 2. Return Main Menu    |
--------------------------
> Select Option Number :
```

7-3. select 'Show All Plan' in option menu

After the input of plan, user can see the printed plan.

8. select 'Print Grocery_List' in option menu



User can see the the printed grocery list for input plan.

9. select 'Exit Program' in option menu

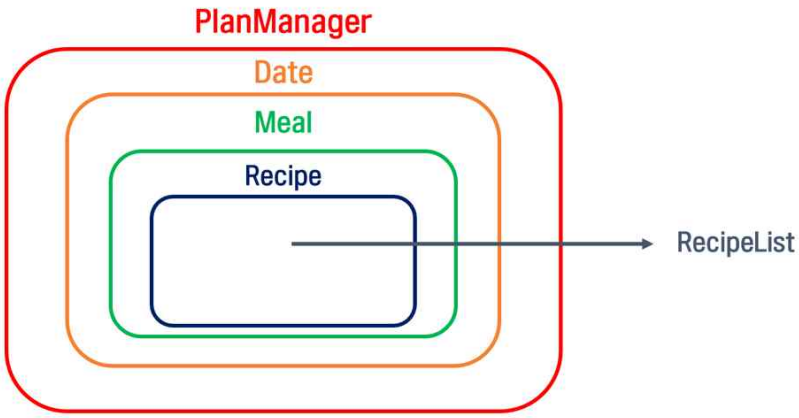
```
-------- Main Menu --------
| 1. Show All Recipe      |
| 2. Browse Recipe        |
| 3. Add Recipe           |
| 4. Show All Plan        |
| 5. Add Plan             |
| 6. Print Grocery_List   |
| 7. Exit Program         |
--------------------------
> Select Option Number : 7
Thanks to use our IIKH Program!
This program is made by OOP class01 Team 2
```

end of program.

(g) explain how you applied object oriented concepts to the development for your project. also explain what you felt and learned from the project.

<Bottom-up approach>

We use bottom-up approach to design the program so that objects interact with each other. Software components of our program are as below. They are work as component of object oriented program.



<Bottom-Up approach>

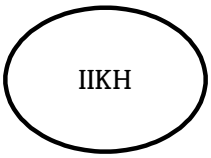
We made Recipe objects, piled recipe objects to make Meal objects. Stacked meal objects to make Date objects, and stacked date objects to make PlanManager objects. Therefore, it is convenient to modify when expanding the program. For example, add a Restaurant object to a Date object.

<Information Hiding> / <Data Abstraction> / <Data Encapsulating>

we declared private view to hide member data. We use getter, setter function only if when the value of the member data must be imported or modified. In addition, the implementation of each member function of the class was hidden to design object-oriented.

(h) Conclusion

We developed a PC-based application, "IIKH (the Interactive Intelligent Kitchen Helper)". The purpose of IIKH is to replace the index-card system of recipes found in the average kitchen. Thus, we implemented functions such as making a database of recipes, the kitchen helpers in the planning of meals, and providing a date-by-date grocery list.



In carrying out above task, We have implemented on the basic ideas of object-oriented modeling and design. We designed it according to the process described in the class. As a result, structural completeness was high. Also, we could feel the benefits of using object-oriented language. It was more convenient to modify the code after implementation as well as the development process.

We are still dwell on implementing Object-oriented code. It is regrettable that the focus was on implementing the IIKH function rather than implementing Object-oriented code. When We reviewed the source code at the end, there were quite a few codes that could be modified based on object orientation. However, this assignment has a deadline. So we put in as much effort as we could and submit it.

It is necessary that code refactoring by adding object-oriented concepts that were not applied in this project. We also think it is good to implement GUI for user convenience and add additional features.

Explain What you felt and learned from the project

<이주연>

I have written a procedure-oriented program with C. But this time, I wrote a IIKH program with C++, it was a new experience of thinking object-oriented.

Clearly, as the program was organized around objects, it was felt that the program was organized by interacting with each other, and it was convenient to reuse various functions used when writing code.

Although it was not easy to carry out a team project in a non-face-to-face school class, I think it is an opportunity to learn a lot about object-oriented thinking.

I took the role of coding in relation to PlanManager, Date, and Meal. It was also hard to think about the class design of the whole program. Rather, it seems to take longer to think about how to implement the class than implementation. Although it is regrettable that the project could have been implemented more object-oriented as it is the first project to be

implemented in c++, through this experience, I want to design the remaining projects more object-oriented.

<김승아>
I thought about applying it to this project after seeing the handout print that the professor gave me during class.
The printout I considered is as follows.
▶Handout1: Factors of Software Quality
understandability, Completeness,Conciseness, Portability, Maintainability, Testability,
Reliability
▶Handout2: Benefits of Data Encapsulation
protection of implementation (safety), readability, implementation independence
In fact, it was understood by the head, but it was not very touching. However, I could feel the characteristics and benefits of OOP through this project.

<배인경>
Through this project, I was able to develop object-oriented thinking. Although the class design was carried out through several online meetings with the team members, it seems that the class was modified to be object oriented continuously. Through this project, I was able to develop object-oriented thinking. As a team leader, I tried to divide roles to push ahead with the project.
Since I have developed object-oriented thinking through this project, I want to implement more object-oriented programs in our next project.

<이채현>
It was my first actual team project. I studied object oriented programming in software-programming class by java. I've done project by myself by then. I learned that working together is very highly maintained job. Doing a team project with a new programming language was really hard. It was similar with C and java but detailed grammar was different Using Github was convenient in team project. Next time I will do more job and start early so my team will have enough time to do project step by step.

<황현수>
It was very hard to complete this project because it's first time for me doing project with other people. But I can complete project because of our team members. I'm very grateful and sorry with their help. However from this project, I learned many things about C++ and how to progress a project with team members. Also it was helpful time to use a site like github which is useful for team project.