

<p align="center"><b>CTIS 222 Object Oriented Analysis and Design</b></p> <p align="center">Spring 2019-2020</p> <p align="center"><b>Homework # 3 (3<sup>rd</sup> Iteration of the Project)</b></p> <p align="center"><b>(15% of the total contribution)</b></p> <p align="center"><b>Due Date: 13 June 2020 Saturday 23:55 (Final Exam Date)</b></p>			
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**A) Project Title:** Online Weather Condition System (WEATCO)

### **B) Updated Project Description:**

Today, many phone users use the weather application. Generally, this is applied to the phones installed weekly reports. Users can get seven-day weather forecasts based on their chosen city or location. But most users are deprived of features such as selecting multiple cities, comparing them, and receiving alert notifications. Weathco System was designed to meet such specific requirements. Weathco system provides most users with detailed weather analyzes, humidity, wind speed and percentage of precipitation. Apart from this, if the location is open automatically, it is updated and gives information according to different districts. This is exactly the difference of the Weathco system from other weather applications. Weathco system has four types of users. It has System admin, Database admin, normal user and premium user. All of them can register, log in, log out and access profile information.

It is mandatory for members and admins to use mail and phone while registering. Apart from this, they are required to accept system contracts. Apart from that, the things that require a high level of system are database and location selection.

There are four sensor types in the system. These are humidity sensor, wind speed sensor, rain intensity sensor and temperature sensor. These sensors that you will get two types, one of which is weekly. The other will be able to see the monthly report. In those who do not control the system, it is divided into two if one is standard user and one is detailed information is the premium user who can see their mercenaries. It has two another main actor who are Database Admin and System Admin in the system. System admin and Database admin are disjoint with each other. The system admin has more privileges. The system Admin has CRUD as mentioned in the operation. Adding, deleting, reading and updating is completely an action that the System Admin can do only. A chosen database admin only reads the sensor data and reflects it to the system. All four actors are registered to the system, logging in and the presence of contact information is mandatory. The condition of the account method is that it contains a username, password and mail for the logging and authenticating. Domain classes are mostly likely to be users, account, Database Admin, sensor with subclasses and payment.

The System Admin has license to all the features like create, update and delete. Furthermore, System Admin can manage Database Admins (give/take access for CRUD as above). Also, if the Database Admin wants to make any changes within the data, such as change the location or change the category of the weather condition, the request goes to System Admin and s/he can either accepts this request or rejects. In case of the acceptance, the according changes will be made and saved in the system, otherwise nothing will be changed.

The standard user will be able to check the weather condition weekly by searching and the system will give the location and the report option to user. Also, they can look, update their personal information screen. For the premium users, they also can check the weather condition, easily. Premium users can receive daily, weekly and monthly reports according to their wishes. They can compare these

reports. From the moment their position changes, they can get different weather conditions. They can see wind speed, humidity and rain intensity. If they want, they can receive some instant changes and alerts via SMS or notification.

C)

**actors**

System Admin, Database Admin

Standard User, Premium User,

Bank System

**associations**

**<<include>>**

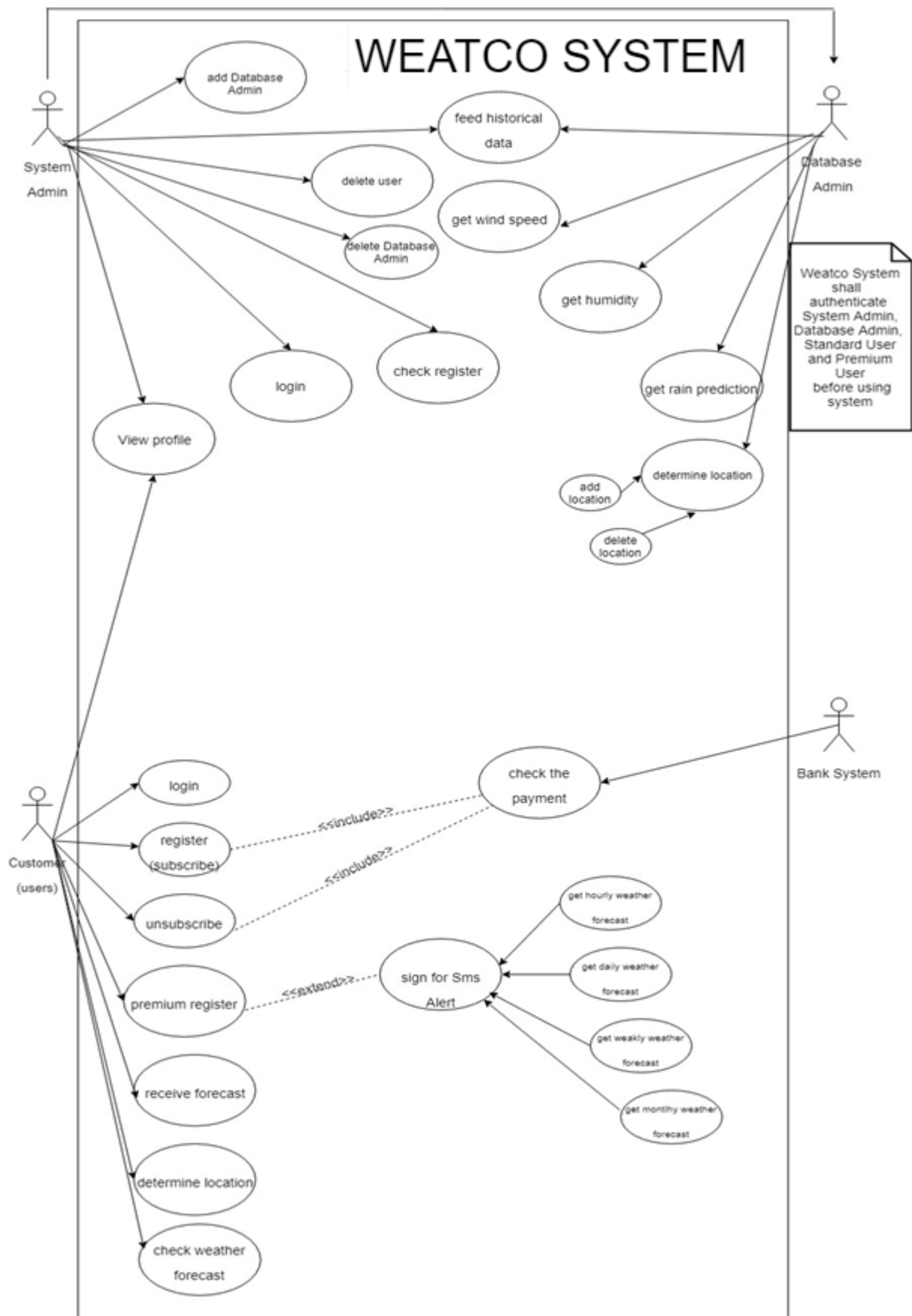
*check the payment, display monthly forecast, manage alert, add location, Add humidity level, Add rain prediction, Add temperature*

**<<extend>>**

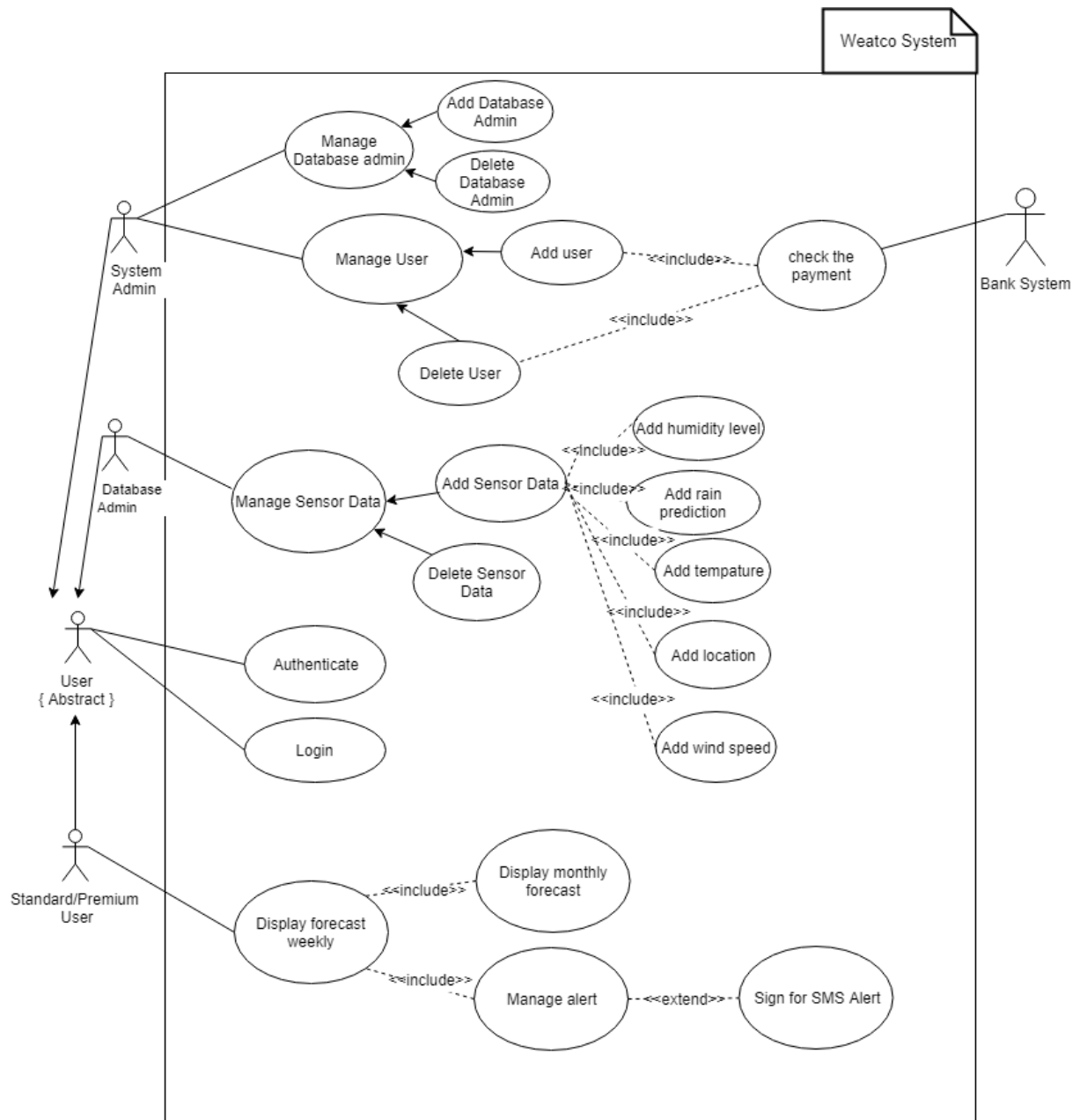
*Sign for SMS alert, (notification)*

**System Boundaries**

- Internet connection
- Server shutdown
- Meteorology Station
- Sensor failure
- Payment issue



## UPDATED C)



## D) Updated D)

### UC-1

ID:	UC-1
Title:	Authenticate
Description:	Authentication to the system
Primary Actor:	System Admin, Database Admin, Standard User, Premium User
Preconditions:	System waits for actor's input
Post-conditions:	Authentication completed
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"> <li>1. User registers into the system.</li> <li>2. Users login into the system.</li> <li>3. System show itself according to the user type and System admin allow to show information according to the user type.</li> <li>4. Users fills in credit card information for premium or skip for free usage.</li> <li>5. Get the premium package.</li> <li>6. Check the weather information.</li> <li>7. Get daily detailed weather forecast via sms.</li> </ol>
Extensions: (Alternative flow)	<p>2a) Controls username is exist or not.</p> <p>2a 1) Controls (mail, phone) two-factor authentication.</p> <p>2a 2) Controls credit card is valid, sufficient or not.</p>
Frequency of Use:	Every time to log in to the system
Priority:	P1

## UC-2

ID:	UC-2
Title:	Add Database Admin
Description:	System Admin manage (CRUD) Database Admin. Database admin can be added.
Primary Actor:	System Admin
Preconditions:	System asks System Admin to input id, name and surname.
Post-conditions:	Database Admin is created
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"><li>1. System asks System Admin to input id, name and surname.</li><li>2. System admin should be in administration interface.</li><li>3. Database Admin is created</li><li>4. Database Admin can login.</li></ol>
Extensions: (Alternative flow)	2a. If inputted id already exists system shows a warning and asks for input again.
Frequency of Use:	When System Admin wants to create or add new admins.
Priority:	P2



## UC-3

ID:	UC-3
Title:	Delete Database Admin
Description:	This use case deletes Database Admin
Primary Actor:	System Admin
Preconditions:	System asks System Admin to input id, name and surname.
Post-conditions:	Database Admin is deleted.
Main Success Scenario: (Main Flow)	1. System asks System Admin to input id, name and surname. 2. Database Admin is deleted.
Extensions: (Alternative flow)	2a. If the inputs do not exist system shows a warning and asks for inputs again.
Frequency of Use:	When the System Admin wants to delete Database Admin.
Priority:	P2

## UC-4

ID:	UC-4
Title:	Login
Description:	This use case is used to login profile info for all the participants. Also, it has allow used to changing, updating, editing or upgrading the level of profile info.
Primary Actor:	System Admin, Database Admin, Standard User, Premium User
Preconditions:	Actor should be authenticated and logging into the system
Post-conditions:	Profile page is opened
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"><li>1. Authentication</li><li>2. Enter username, mail and password.</li><li>3. Click view profile</li><li>4. Profile page is opened</li></ol>
Extensions: (Alternative flow)	2a. If the actor could not authenticate, view profile will not be accessible.
Frequency of Use:	When actor wants to logging his/her page.
Priority:	P1

## UC-5

ID:	UC-5
Title:	Display Weather Forecast Weekly
Description:	Weather forecast will be opened for the user and it shows weekly report for all the user.
Primary Actor:	Standard User, Premium User
Preconditions:	Loggin
Post-conditions:	Shows weather condition weekly
Main Success Scenario: (Main Flow)	1. Login 2. Display weather forecast
Extensions: (Alternative flow)	2a. If actor especially Premium user wants to see detailed reports it has more detailed info button to get more reports.
Frequency of Use:	When the actor wants to see weather forecast.
Priority:	P2

## UC-6

ID:	UC-6
Title:	Display Monthly Forecast
Description:	This use case is used by premium user to check weather condition detailed ones.
Primary Actor:	Premium Users
Preconditions:	The main weather forecast report page will be opened.
Post-conditions:	The weather condition will be shown by premium button.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"><li>1. Main page will be opened by the premium user.</li><li>3. The premium button will be clicked</li><li>4. The system will show weather condition with that country/city.</li></ol>
Extensions: (Alternative flow)	2a. If the user enters incorrect or payment could not be seen by the bank system monthly, system does not allow to show.
Frequency of Use:	When the premium user wants to check weather condition.
Priority:	P1

## UC-7

ID:	UC-7
Title:	Sign for the SMS Alert
Description:	This is used by premium user who want to be warned about abnormal weather condition occurred.
Primary Actor:	Premium User
Preconditions:	The main page will be opened
Post-conditions:	The reports with the relative city can be posted via SMS notification.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"><li>1. The main page will be opened</li><li>2. The users enter premium button that wants to check.</li><li>3. The system recognizes that premium user and draw his/her phone number info to give SMS alert.</li></ol>
Extensions: (Alternative flow)	<ol style="list-style-type: none"><li>2a. If premium user does not give his/her number than SMS alert does not work.</li></ol>
Frequency of Use:	When premium user wants get alert from the system.
Priority:	P3

## UC-8

ID:	UC-8
Title:	Manage Sensor Data
Description:	This use case is used by database admin to take updated reports from the sensor data hourly to put into the system.
Primary Actor:	Database Admin
Preconditions:	Database Admin should login into the system and receive data.
Post-conditions:	Certain humidity level, the precipitation of rain, wind speed and warnings are appeared.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"><li>1. The main page will be opened</li><li>2. Database Admin logins to the system</li><li>3. Admin should be in Manage Data.</li></ol>
Extensions: (Alternative flow)	<ol style="list-style-type: none"><li>2a. There can be defects during the delayed update and renewal process.</li><li>2b. The Database admin can have problems in logging in stage.</li><li>2c. Data failure can be occurred.</li><li>2d. Electricity, sensors or server failure can be occurred.</li></ol>
Frequency of Use:	When Database Admin wants to CRUD operation. Hourly.
Priority:	P1 - High

## UC-9

ID:	UC-9
Title:	Add Sensor Data
Description:	If the Database Admin wants to new report.
Primary Actor:	Database Admin
Preconditions:	D.A should login, enter Manage Data.
Post-conditions:	D.A add new sensor data report.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"> <li>1. The D.A logging into the system.</li> <li>2. Then s/he enters Manage Data option.</li> <li>3. Database Admin receive new report from the sensor datas and add into the system.</li> </ol>
Extensions: (Alternative flow)	2a.
Frequency of Use:	When the Database Admin frequently change new report because it should be updated hourly.
Priority:	P1

## UC-10

ID:	UC-10
Title:	Delete Sensor Data
Description:	Database Admin deletes old or irrelevant data from the system
Primary Actor:	Database Admin
Preconditions:	Database Admin should be in the Manage Data part.
Post-conditions:	Sensor data is deleted.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"><li>1. Database admin should be in the administration part.</li><li>2. Database admin should delete datas those are not updated.</li></ol>
Extensions: (Alternative flow)	2a. If the given data is already correct, check again and give the report for the all users.
Frequency of Use:	When the Database admin wants to delete.
Priority:	P2



## UC-11

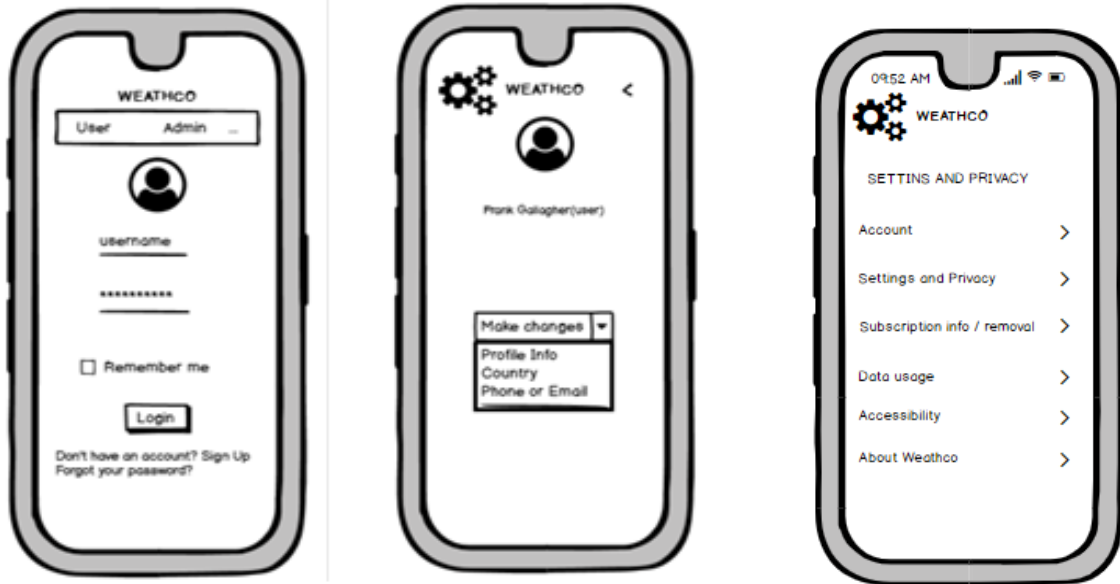
ID:	UC-11
Title:	Add User
Description:	System Admin add user
Primary Actor:	System Admin
Preconditions:	Actor should be in authenticate
Post-conditions:	User can use the system.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"> <li>1. System admin should be in the administration part.</li> <li>2. The email and password information of the newcomer user should not be the same as the previous users.</li> <li>3. The bank system, for the premium user, must confirm that she/he has made the payment and must have informed it to the system admin.</li> </ol>
Extensions: (Alternative flow)	2a. If the user name or email is existing or payment issue occurs, System Admin should now allow to user to logging.
Frequency of Use:	When new users come to the system.
Priority:	P1

## UC-12

ID:	UC-12
Title:	Delete User
Description:	System Admin can delete user who are not use the system or not pay.
Primary Actor:	System Admin
Preconditions:	System Admin logs into the system.
Post-conditions:	User can be deleted.
Main Success Scenario: (Main Flow)	<ol style="list-style-type: none"> <li>1. System admin logs into the system</li> <li>2. System admin check the payment and usage of system.</li> <li>3. If the mail was the same for different members later or if some users have not paid for a long time for premium usage, the admin can remove them.</li> <li>4. Then user can only see the weekly report.</li> </ol>
Extensions: (Alternative flow)	2a. The user to be deleted may have already left the premium user or there can be a problem with the user database
Frequency of Use:	When the system admin wants to delete.
Priority:	P1

E)

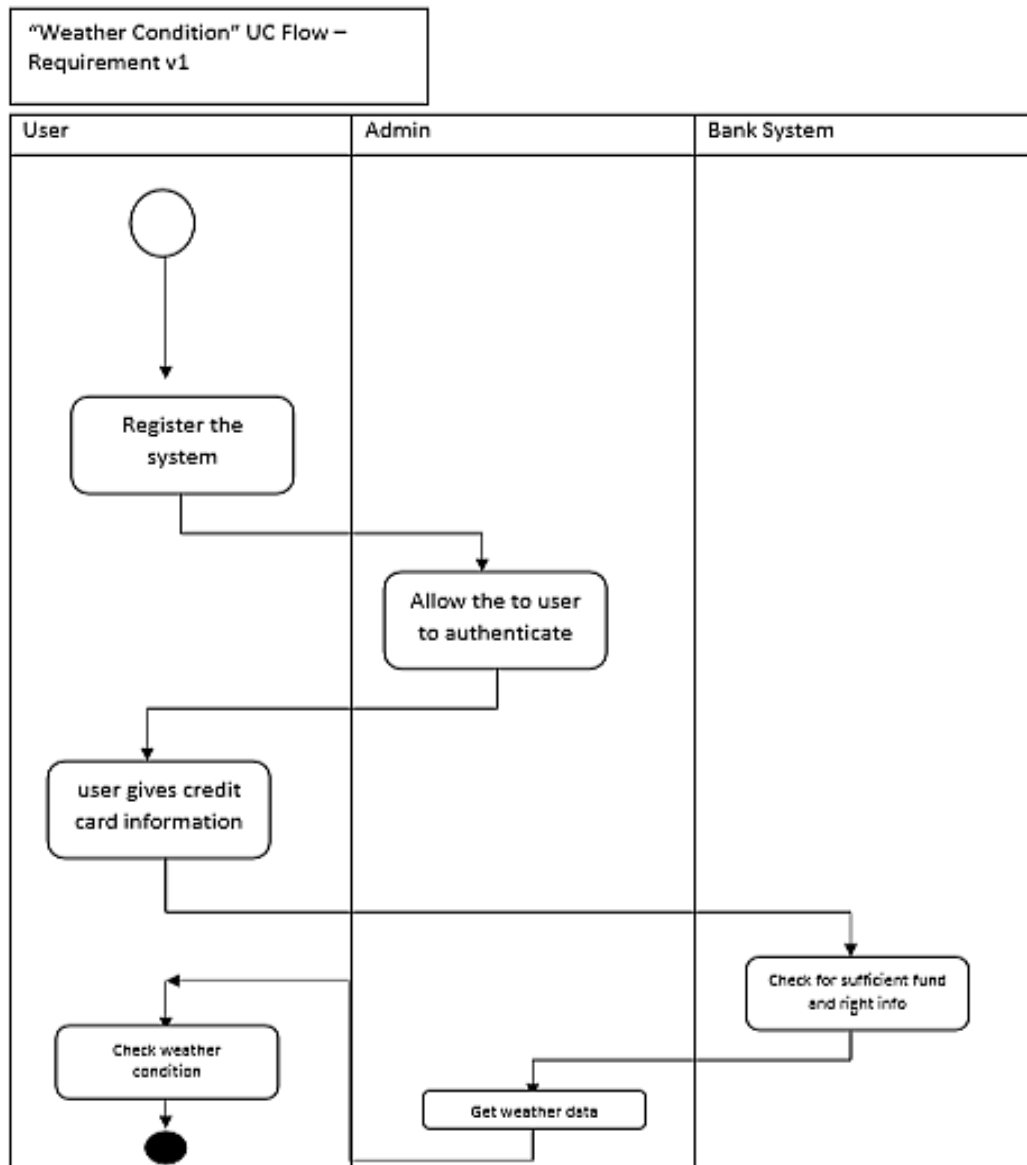
UC-1	UC-4	UC-12
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UC-6	UC-5
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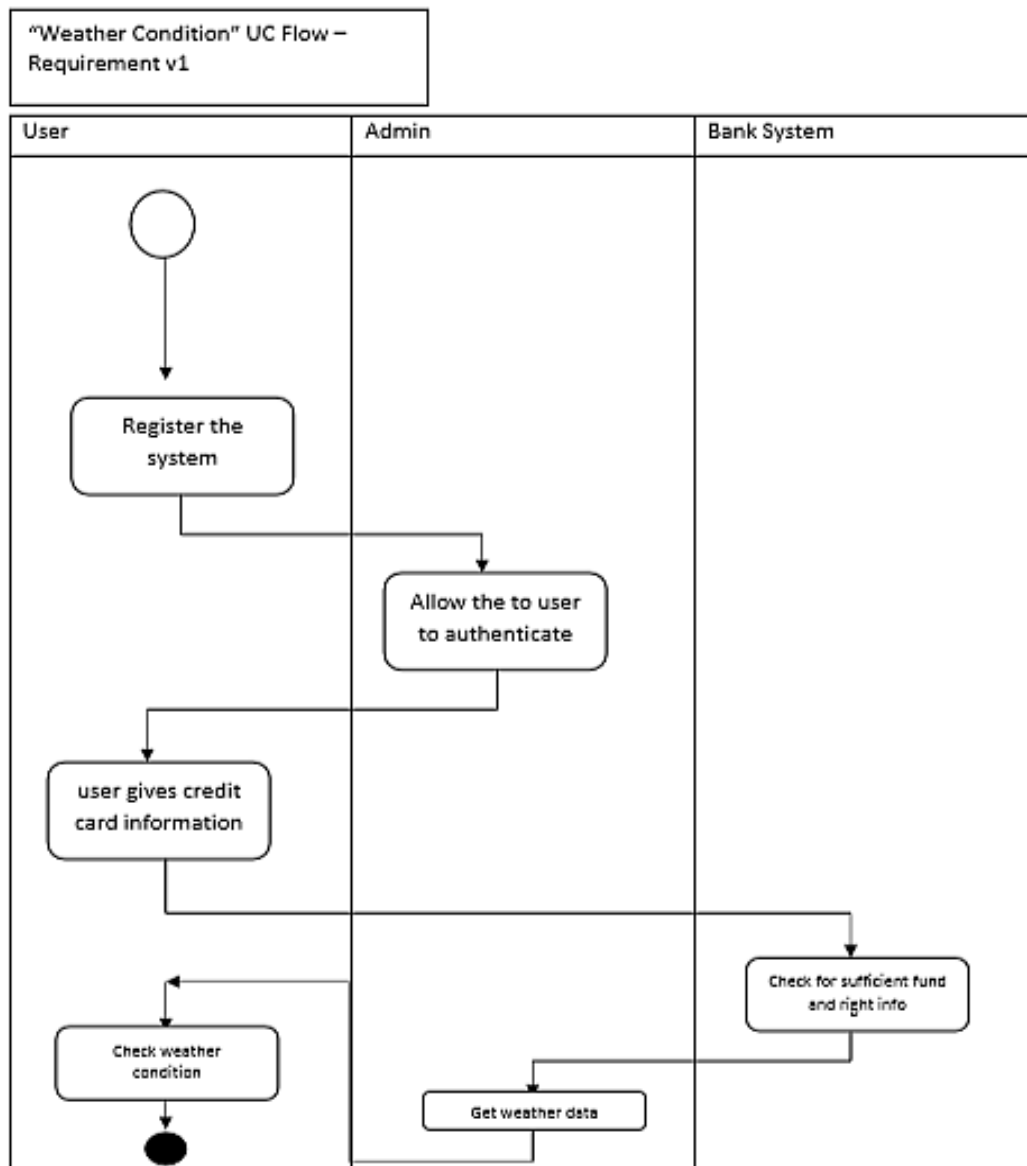


## F) UML Activity Diagram



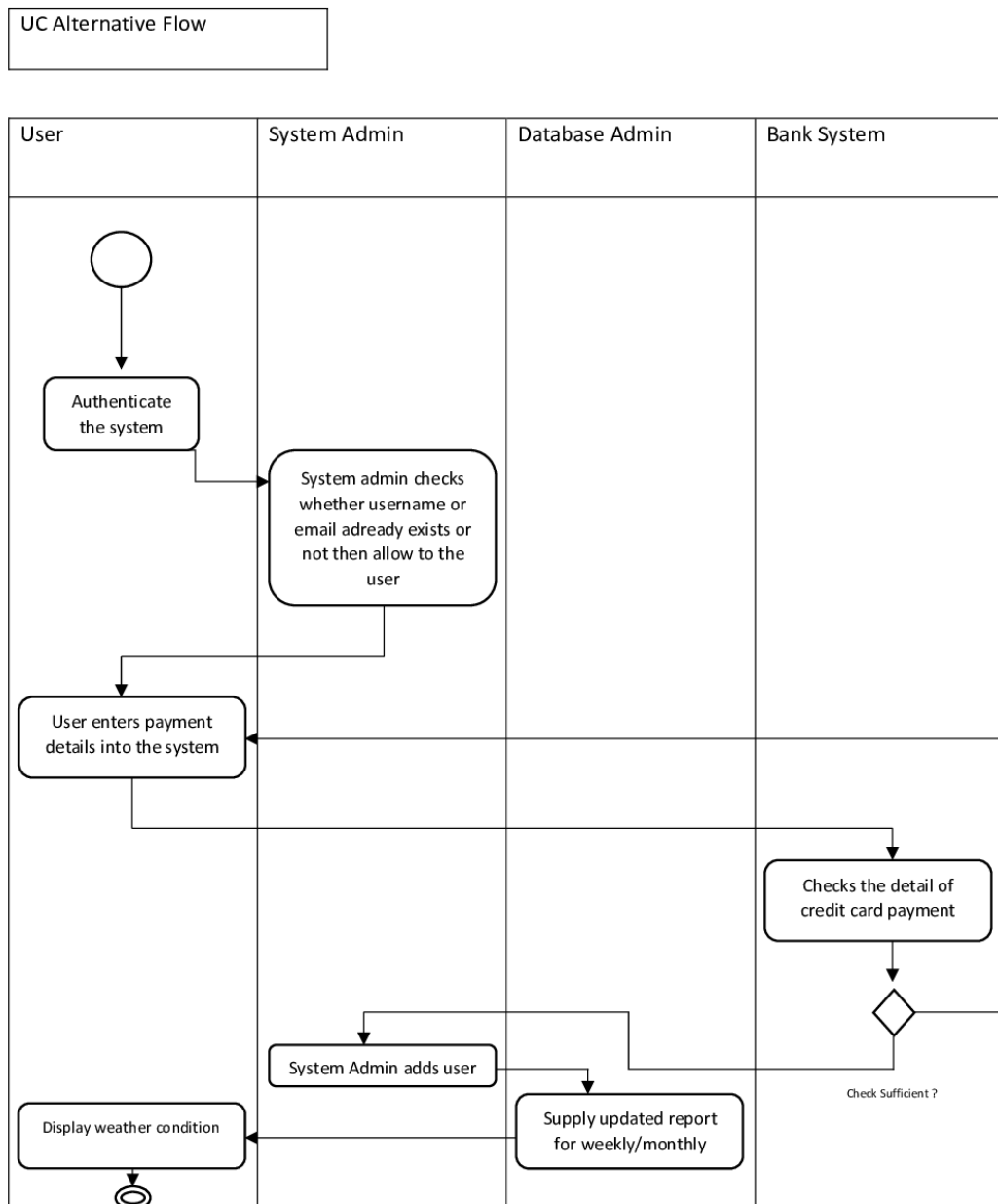
## Updated F) UML Activity Diagram

### (Basic-UC-1)



# Updated F)

## (Alternative-UC-6)



## **G) List of Domain Classes**

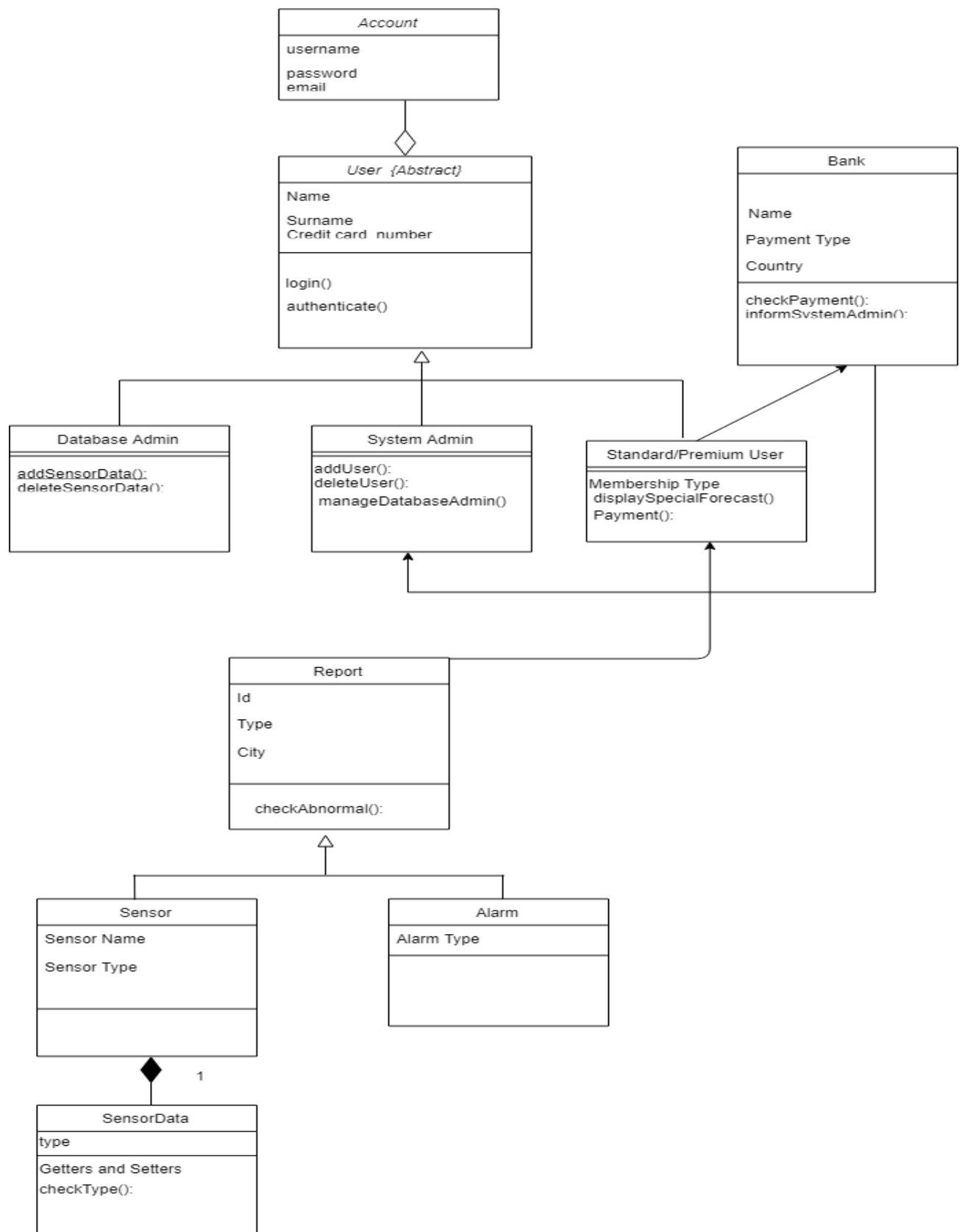
- UserLogin
- ManageAdmin
- WeatherConditionService
- PremiumDetails
- WeatherStatus

## Updated G) List of Domain Classes

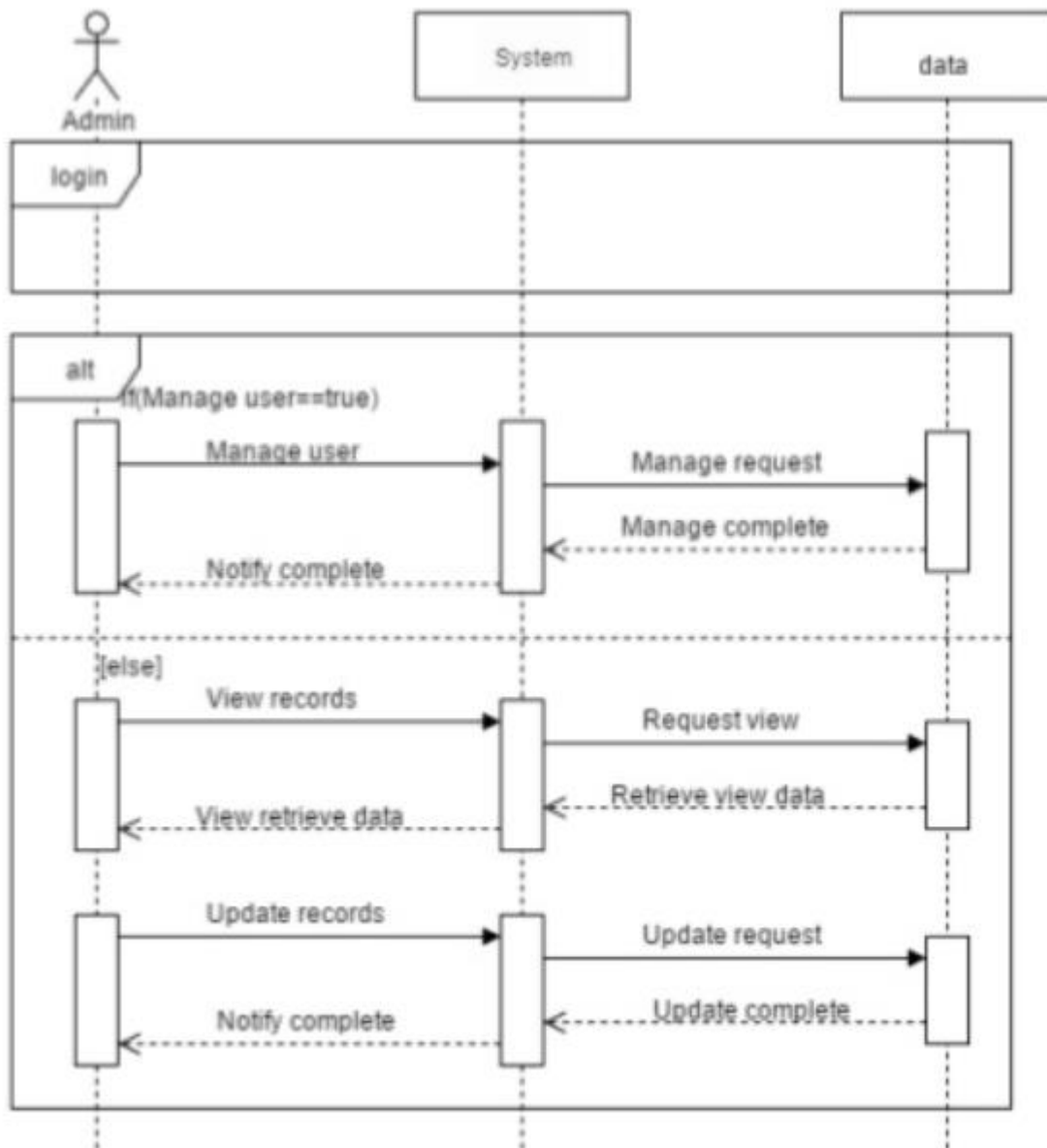
- Users
- Account
- Database Admin
- Bank
- Payment
- Sensor
  - Sensor type
- Alarm
- Report
  - Weekly, monthly
- Sensor Data

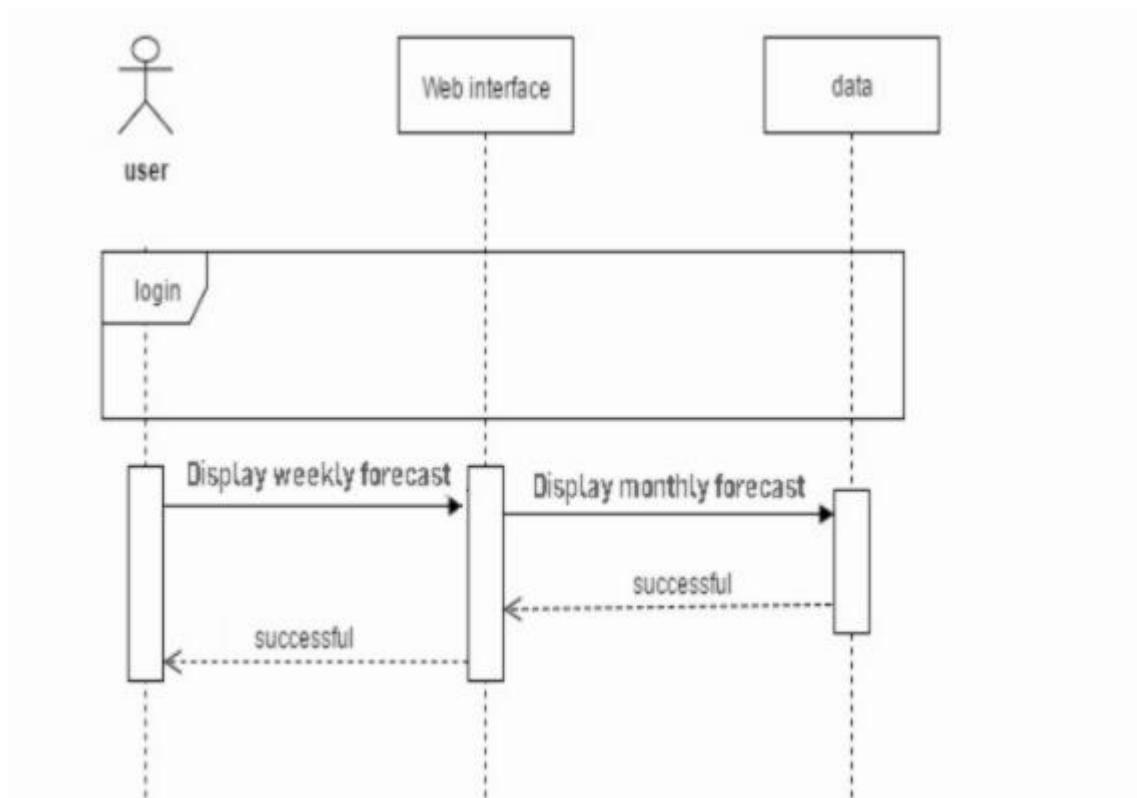


## H) UML Class Diagram

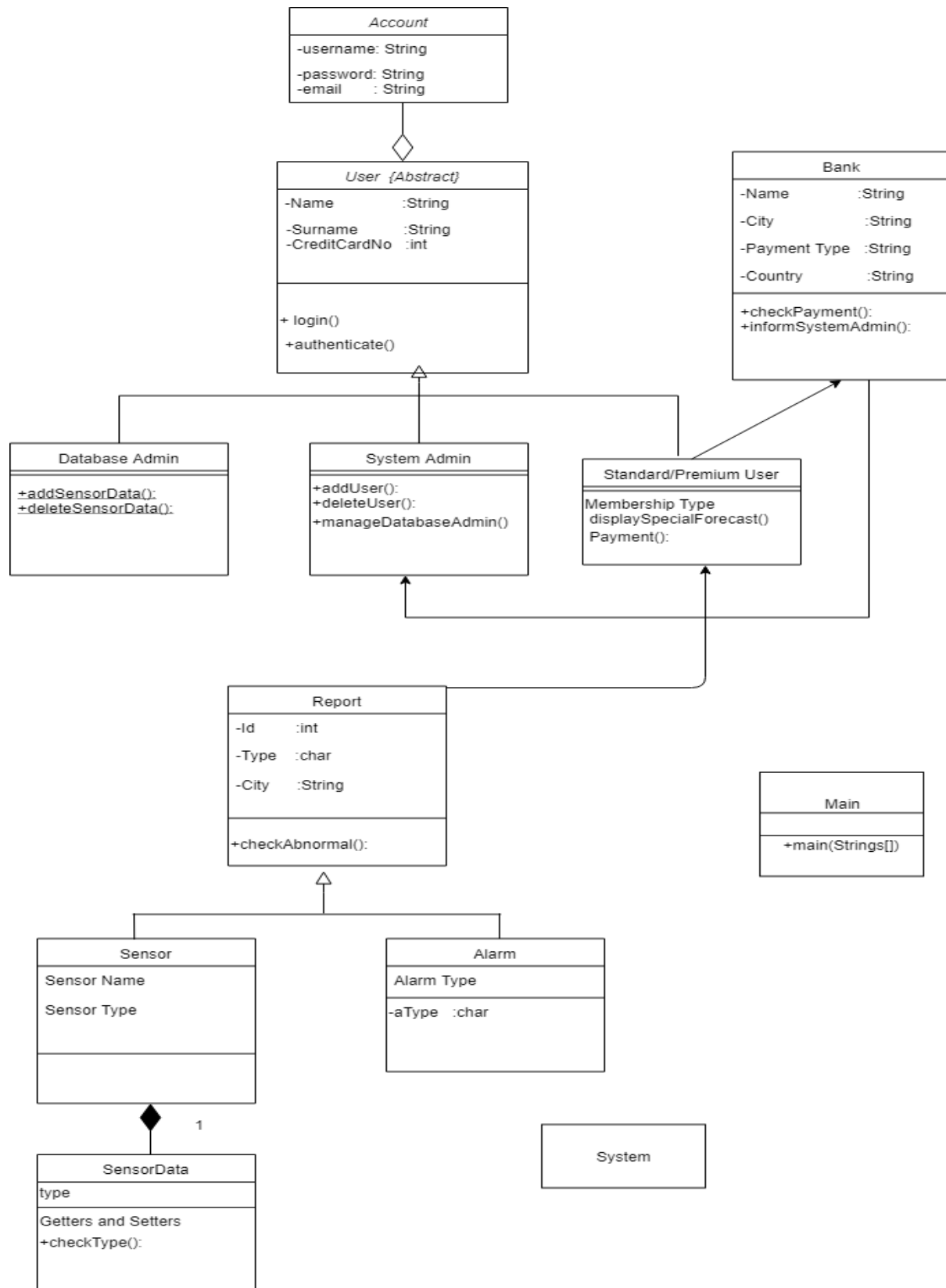


## i) UML Sequence Diagram





## Updated H) UML (Design) Class Diagram (New Section)



J) Write down the names of the OOD principles, guidelines, ideas, and patterns (SOLID, GRASP, MVC etc.,) you used while modeling the detailed design of the project. You need to justify your design decisions. (New Section)

	Name of OOD principles, guidelines, and patterns	Which class(es)/ method(s) you applied? Refer to the detailed (design) class and/or sequence diagrams. Did you have this class in the domain class diagram?	Why you used this OOD principles, guidelines, ideas, and patterns? What you have improved? What you have changed?
1	Single-Responsibility Principle	Classes those have more than two methods should be decreased and those methods will be in the new interfaces.	Classes will look more organized and appropriate.
2	Interface Segregation Principle	Instead of using only one interface, it can be used more interfaces.	It will be more efficient while comparing with one overload interface.
3	Dependency Inversion Principle	Besides bank class is not a parent class, the sub-classes that are standard user/premium and system admin is depending on Bank class. Their needings are not relate with each other at the same level/hierarchical order.	D.I.P makes lower dependency with each other.
4	GRASP/ 2. Creator	Creator is the Account Class.	Creation of objects is one of the most common activities in an object-oriented system.
5	GRASP/ 6. Low Coupling	With using, we are getting rid of the low coupling problem.	It is a measure of how strongly one element is connected to, has knowledge of, or relies on other elements. And it is dictates them.
...you may add			

more rows if need to			
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~~K) Code the 3 Use Cases modelled in Section J using Java.~~  
(New Section)

This section (the partial coding of the project), which was previously announced to be implemented, is canceled due to the special conditions of this semester.

CANCELLED