

**Indian Institute of Information Technology, Allahabad**  
**Object Oriented Methodology (OOM)**

**Mini Project-8**

**Group-10**

**Topic: - Heating, ventilation and air conditioning (HVAC) system**

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**Project overview:-**

When the user pressed the jar file or run the code in net beans. Initially Login screen appears on the screen that contains two input textfield one for the username and the other for the password. The username is **Admin** and the password is **Admin@123**. We also put the reset button which clears all the input fields and in eye icon through which we can see our password. If the password or username is wrong then one alert box appears on the screen saying that something is wrong.

And if the password and username is correct. Then the login window disappears and the navigation and controller window appears on the screen. The controller window is for taking the input from the user .If the user wants to give the random input then we set one button for random input which give random inputs to the temperature humidity and aqi (air quality index) but the mode needs to be filled by the user and it depends on the user that whether there user wants to put the fan on or off. If the user put the fan on then user needs to give the fan speed using the jSlider . The jSlider only enables when the user puts the fan mode on. If the user feels that the input is wrong then there is also one Reset button to reset all the input data. To submit the data there is submit button. We also put ranges on the temperature, aqi value and humidity.

Range for temperature is -50 °C to 50 °C

Range for humidity is 0 to 100 %

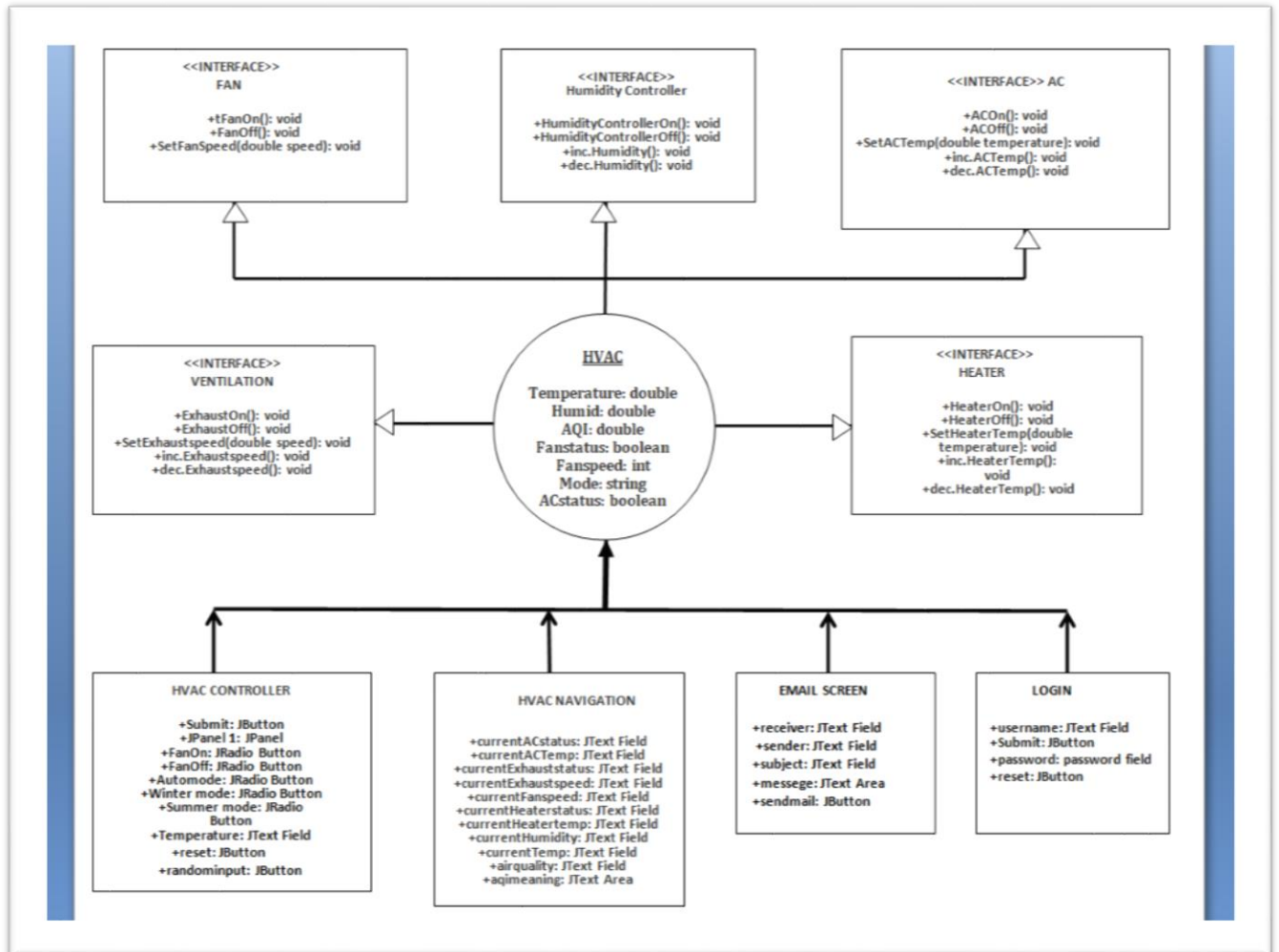
Range for aqi is 0 to 500 (ppm)

If there is any input which does not come in these ranges then one alert box appears showing the error according to the input. And if all the input is within the ranges then 2 screens (or jframes) occur one is navigation window and the other is email screen with the alert box with the message Thank you for the input. In navigation window the status of ac, heater, fan, exhaust, humidity controller is displayed and if any device is on then the speed or temperature according to the device is also displayed.

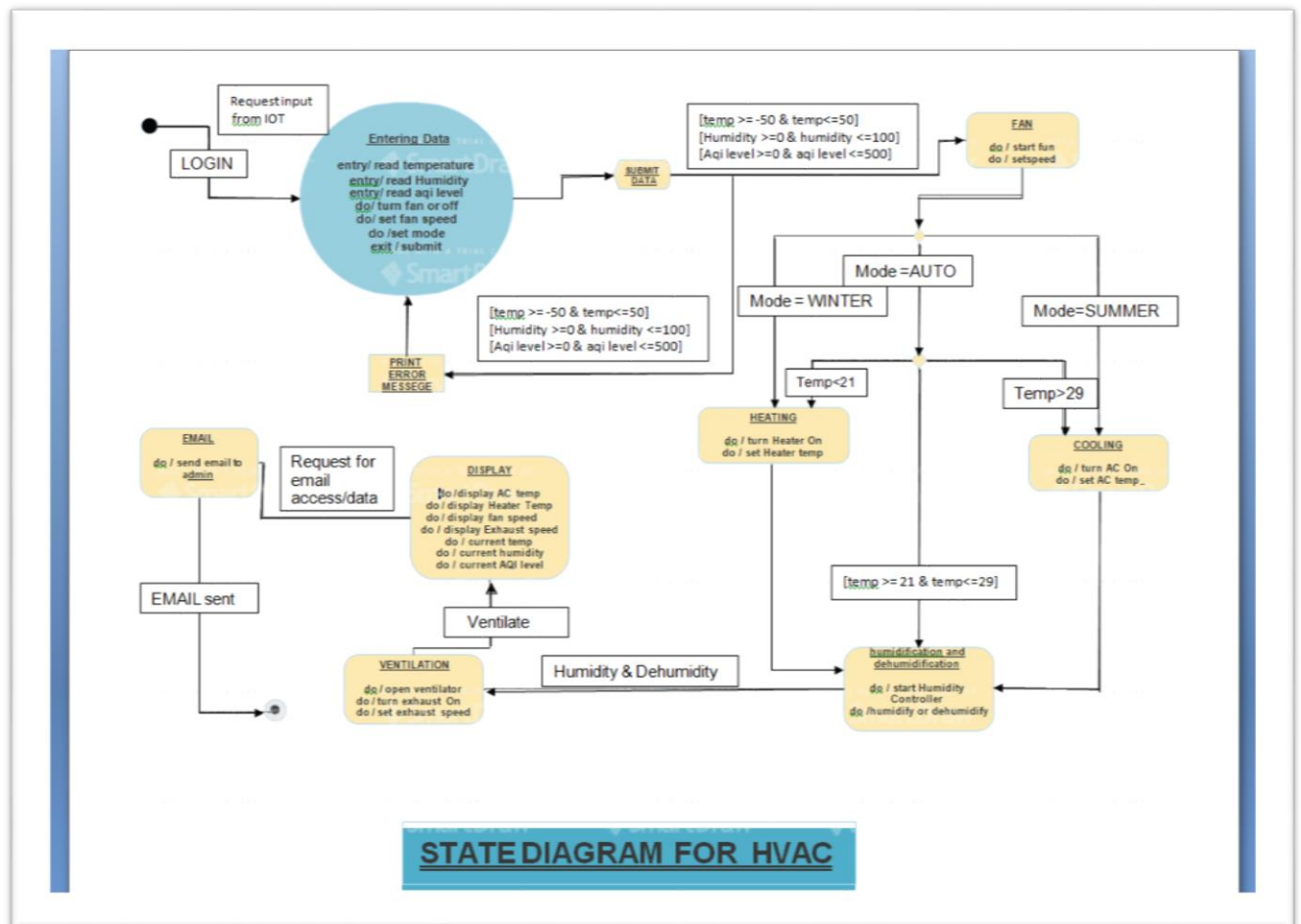
At the bottom of navigation window there is aqi value displayed and according to the aqi value meaning of the air at that time is displayed.

On the email screen, there we displayed all the condition (aqi, device status) of the CC-3 building according to the input from the user in the form of the body of the mail which is to be sent. We also displayed the subject and the mail address from which the mail is to be sent. We need to put the email address to which we were sending all the information of the present condition of devices and air quality. We send mail through the button which is displayed on the emailScreen JFrame and if the mail field is empty then the alert window appears displaying the error message. During the process of these mail on the console there is one message preparing mail and after the successful sent of the mail alert box appear with the message **mail sent successfully**.

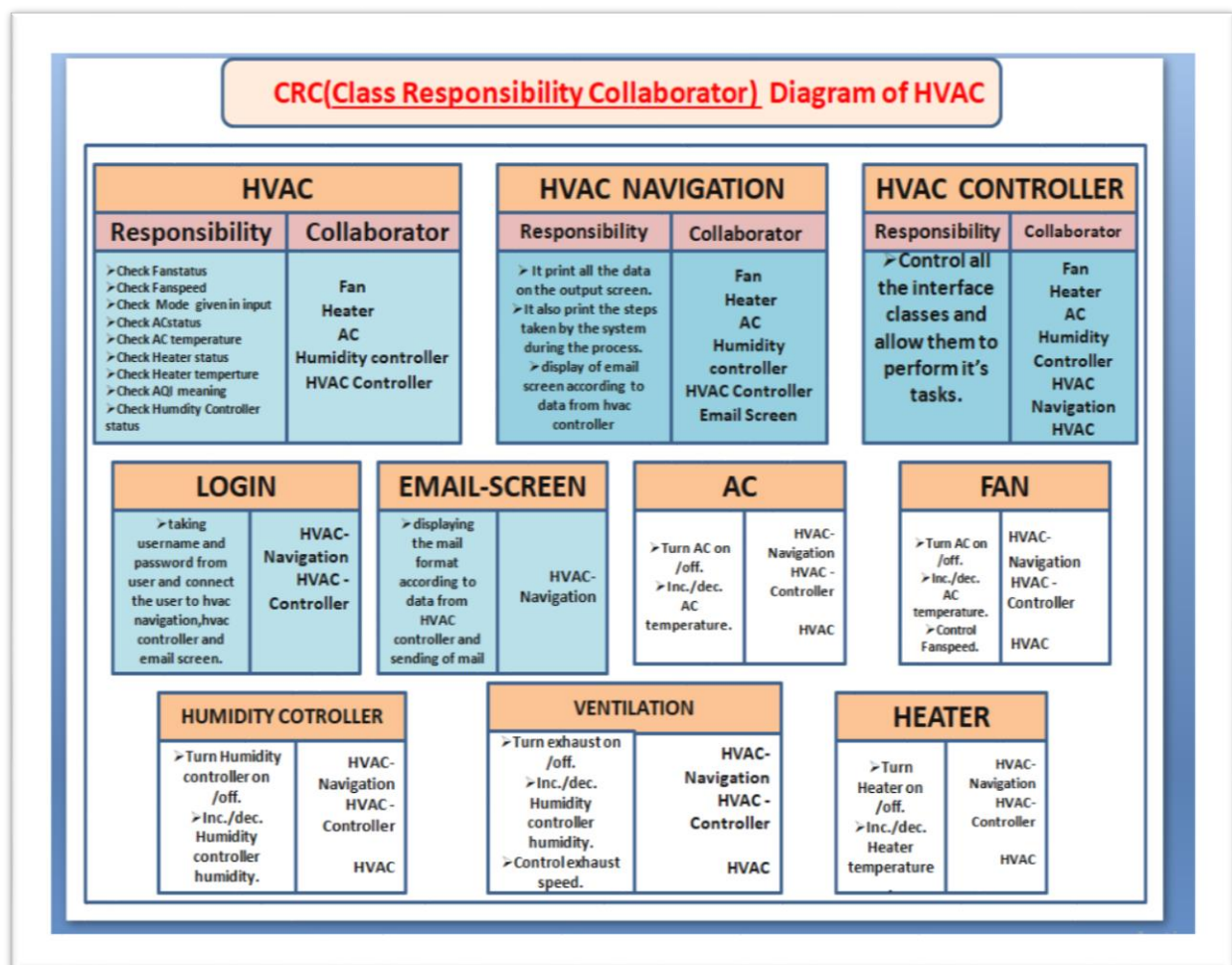
# UML diagram



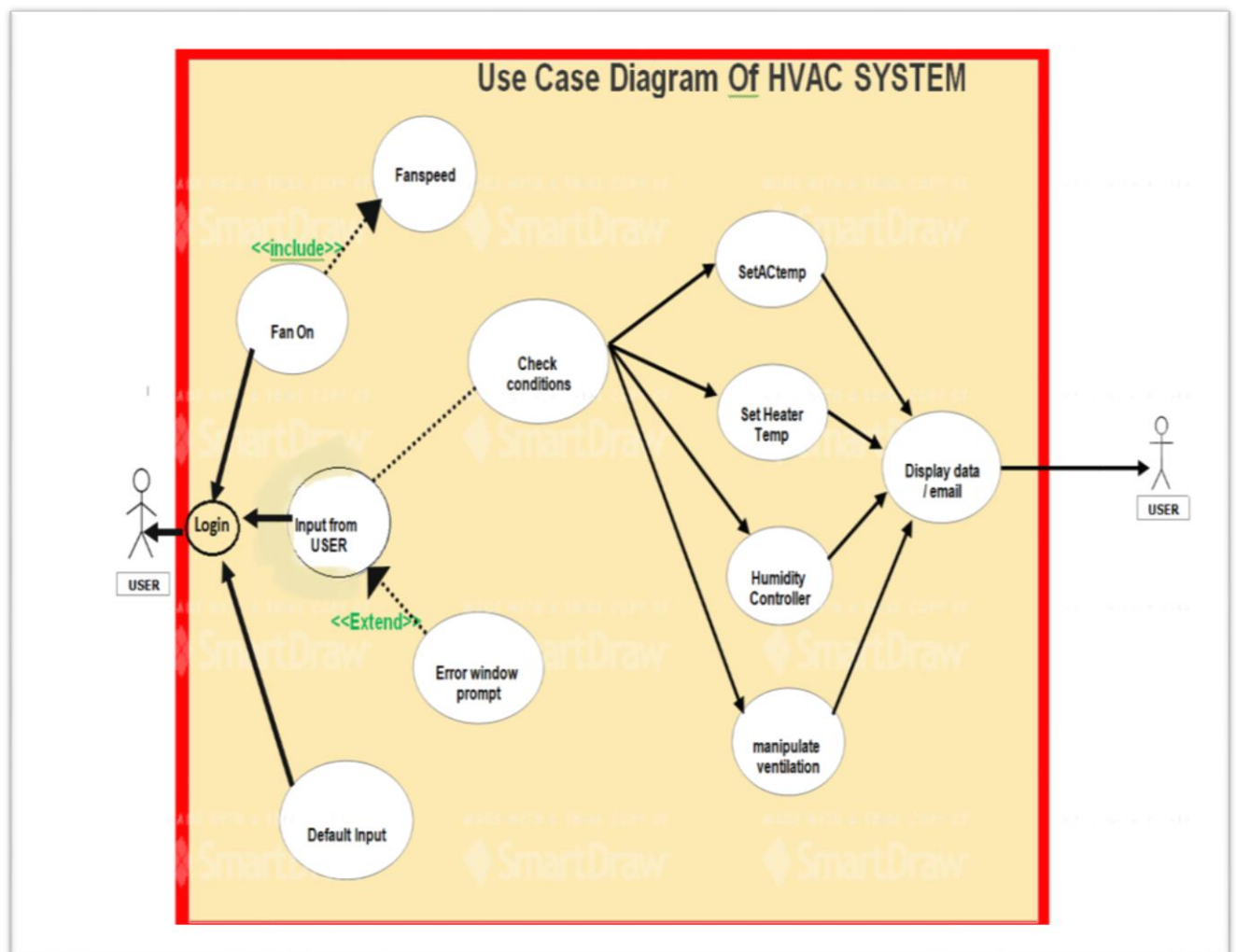
## State diagram



## CRC diagram



## Use Case diagram



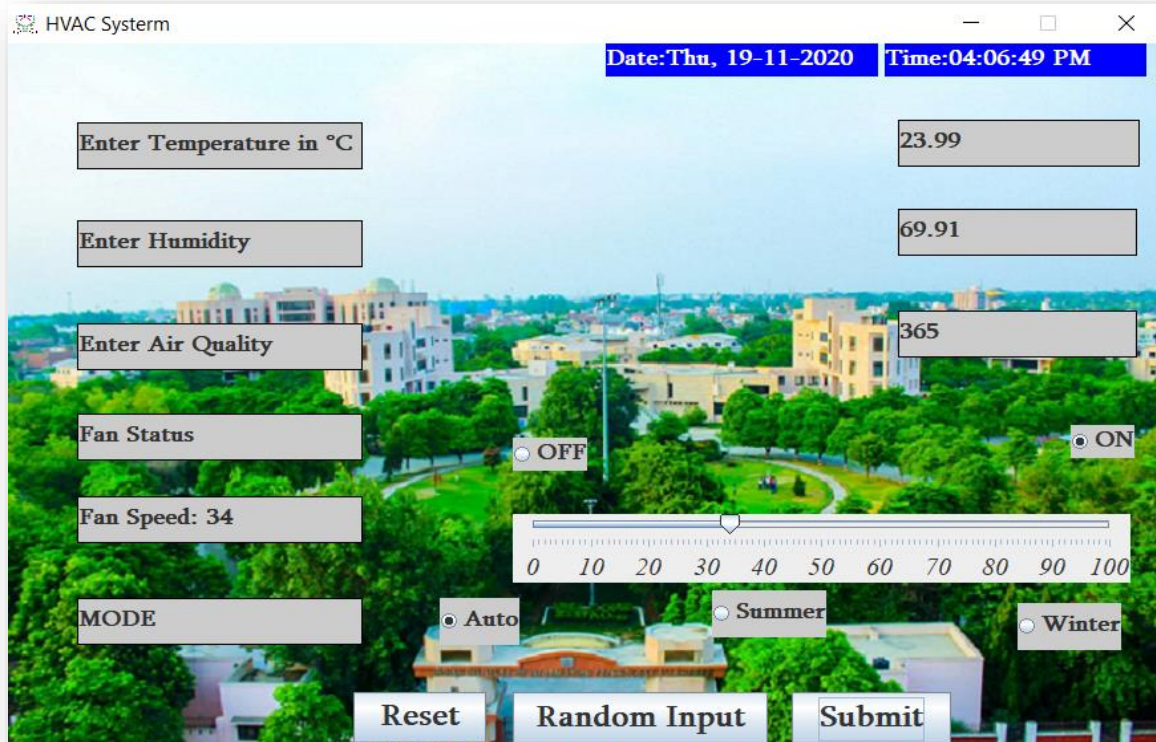


## Login Window



The Login Window interface features a title bar with the text "Login Window" and standard window controls. The main area has a black header with the word "Login" in white. Below this is a background image of a university campus. The interface includes a "User Name" label with a text input field containing "Admin", a "Password" label with a text input field containing "\*\*\*\*\*" and an eye icon for toggling visibility, and two green buttons labeled "Reset" and "Submit" at the bottom.

## HVAC Controller



The HVAC System interface has a title bar with the text "HVAC System" and standard window controls. It includes a status bar at the top right showing "Date: Thu, 19-11-2020" and "Time: 04:06:49 PM". The main area features a background image of a university campus. On the left, there are four input fields: "Enter Temperature in °C", "Enter Humidity", "Enter Air Quality", and "Fan Status". On the right, there are three output fields showing "23.99", "69.91", and "365". Below the "Fan Status" field, there is a radio button interface with "OFF" and "ON" options, where "ON" is selected. A "Fan Speed: 34" field is also present. Below this, there is a slider control for "MODE" with radio buttons for "Auto", "Summer", and "Winter", where "Auto" is selected. At the bottom, there are three buttons: "Reset", "Random Input", and "Submit".

## HVAC Navigation

HVAC System

	Status	Temperature
Air Conditioner	OFF	
Heater	OFF	
Fan	ON	34
Exhaust	ON	500 FPM
Humidity Controller	ON	50
Air Quality in ppm	365.0	
		Meaning
		Hazardous:- Health warnings of emergency conditions. The entire population is more likely to be affected .

## Login Window

Email Screen

**Email Sending Window**

To: iit2019109@iitita.ac.in

From: billisingh94@gmail.com

Subject: Regarding actions taken by HVAC System

Message

Fan Speed:-34  
Exhaust Status:-ON  
Exhaust Speed:-500  
Humidity Controller Status:-ON  
Air Quality (in ppm):-365.0  
Meaning (Acc. to Air Quality):-Hazardous:-  
Health warnings of emergency conditions. The  
entire population is more likely to be affected .

Send Email



## Alert boxes

