



USER MANUAL.

FOR

# AUTOMATIC ELEVATOR CONTROL SYSTEM

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## **To Run this Project via Terminal / Command Line :**

- Open the root directory

**Note: Do not Navigate to dist/, stay on the / root directory**

- Type the following command:  
java -jar dist/OOMProject.jar
- Press Enter

## **ABOUT THE PROJECT**

This Project is a GUI enabled Automatic Elevator System, with automatic door opening and closing mechanism which can detect an overload and prompt the passengers accordingly. We have developed a scheduling algorithm for simulating the moving elevator which is based on serving requests such that it is the fastest possible route. There is a mechanism which in case of Power Cut, immediately sends an Email to the Admin requesting Power Backup, and after receiving the Power Backup directs the elevator to the nearest floor based on which direction it was moving earlier.

Also, we have included a new feature of Emergency Requests, which ignores all other requests in case of an emergency ( say , a medical emergency ) and serves this request first, later resuming to the normal elevator functionality. And for this purpose, only verified personnel (eg. Security Guards on each floor ) with valid Emergency IDs are allowed to call an emergency for someone.

## **Development Tools**

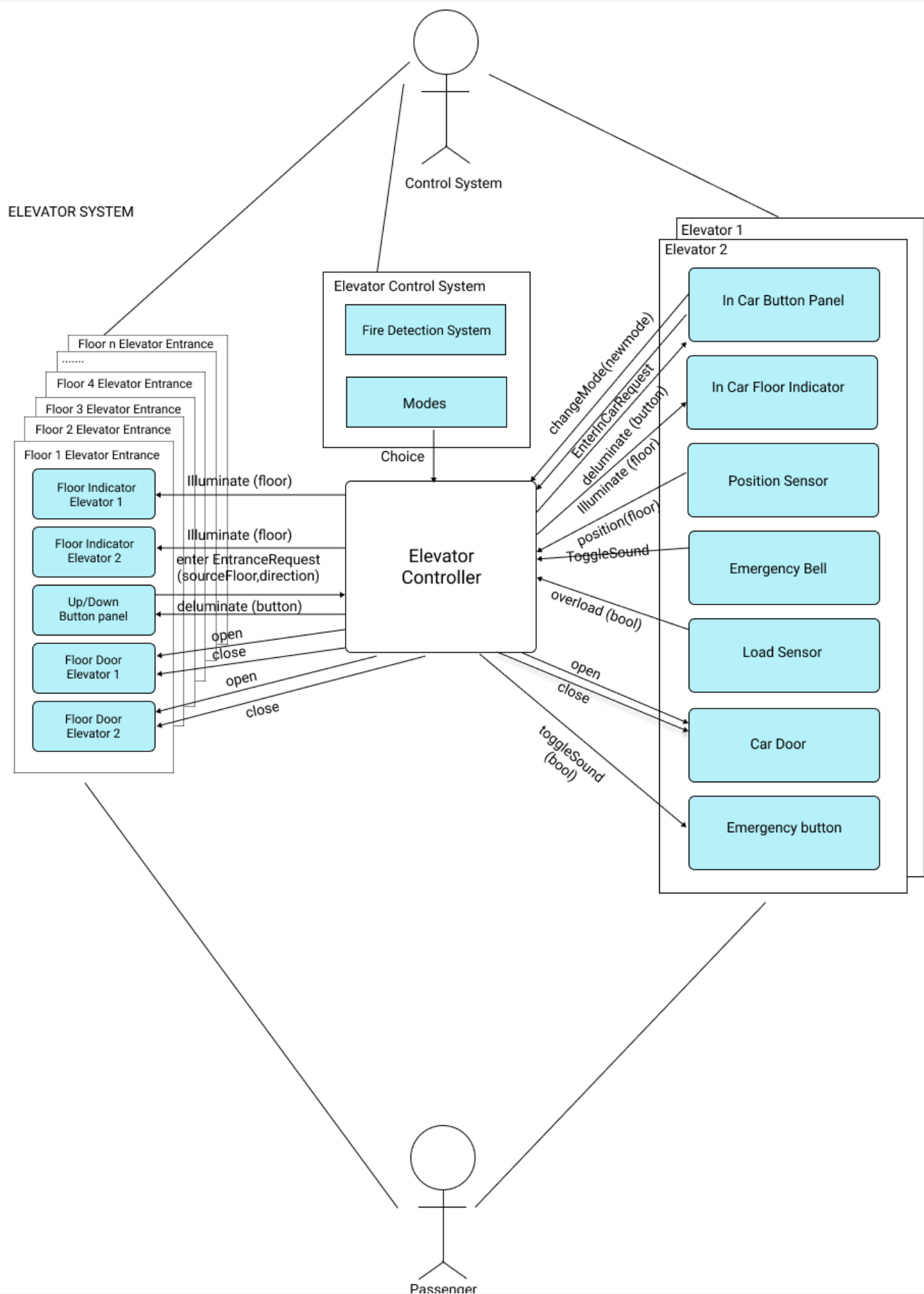
- JDK 15.0.1 (latest)
- Java Swing
- Apache Netbeans 12.1

## **APIs and External Libraries Used**

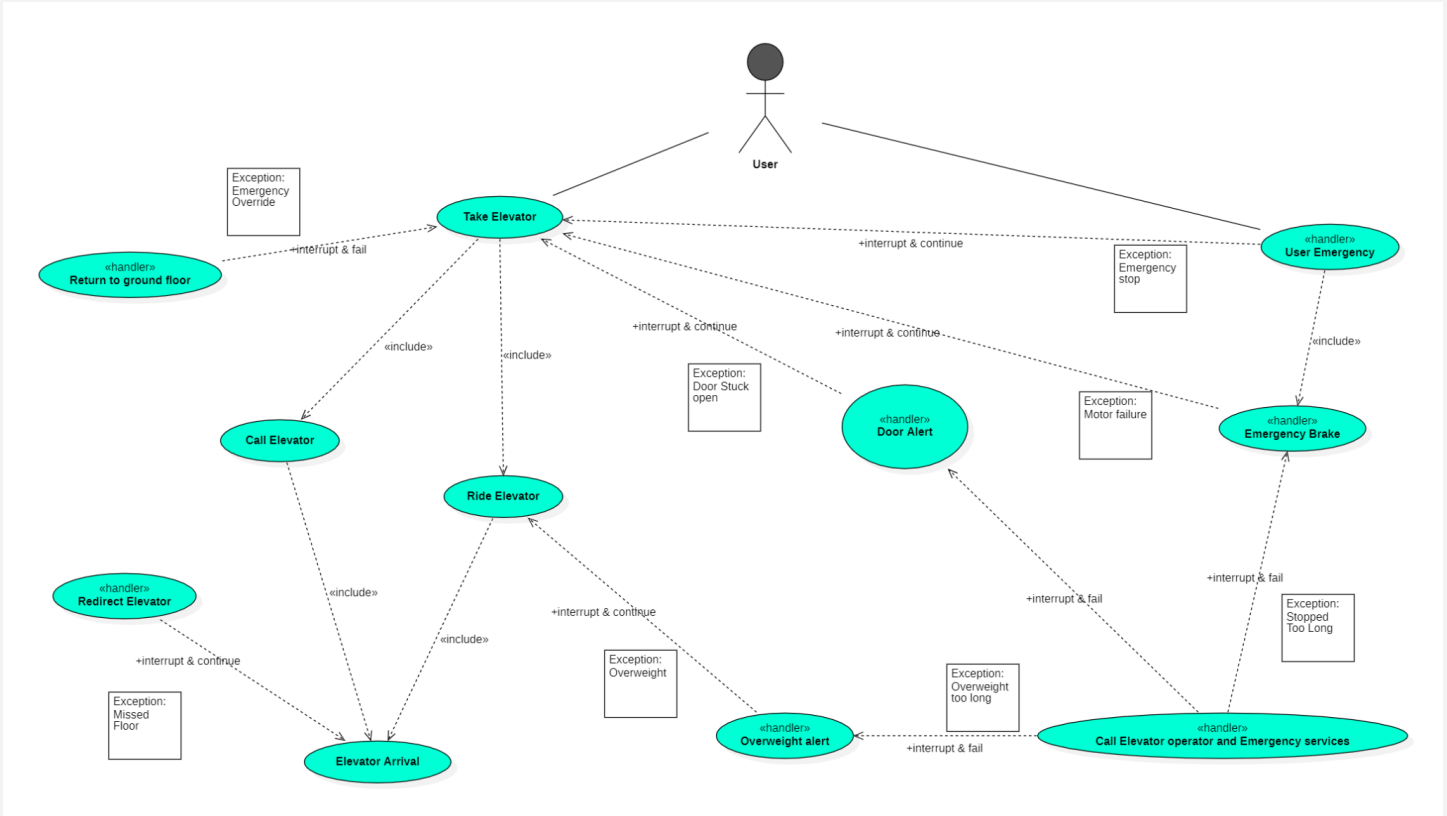
- Java Mail API
- Java Audio API
- Java Activation(used with Java Mail)
- JCalender Library (to implement Date Picker for Log Screen)

## **System Requirements**

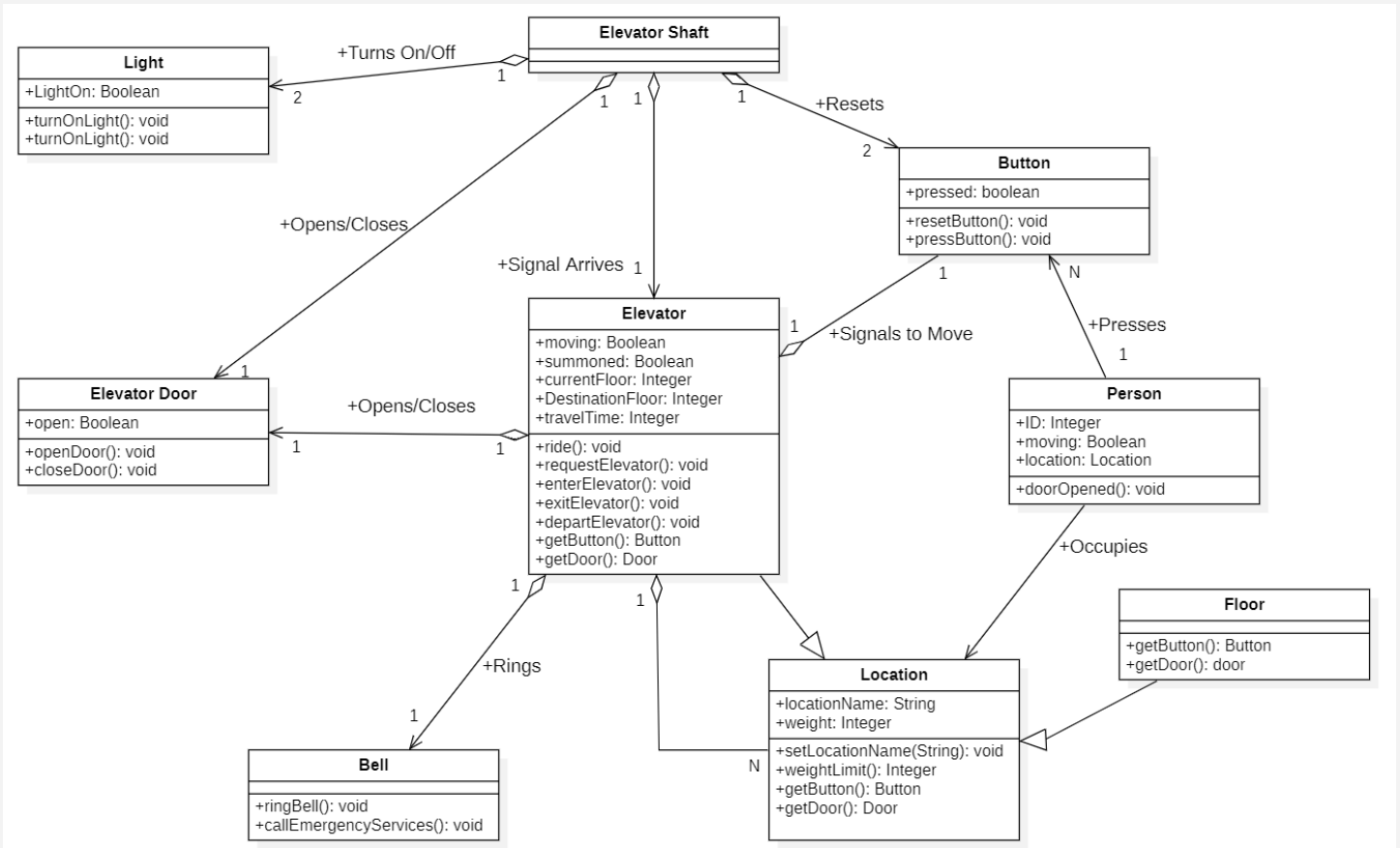
- Operating System: any
- JDK 15.0.1 preferred



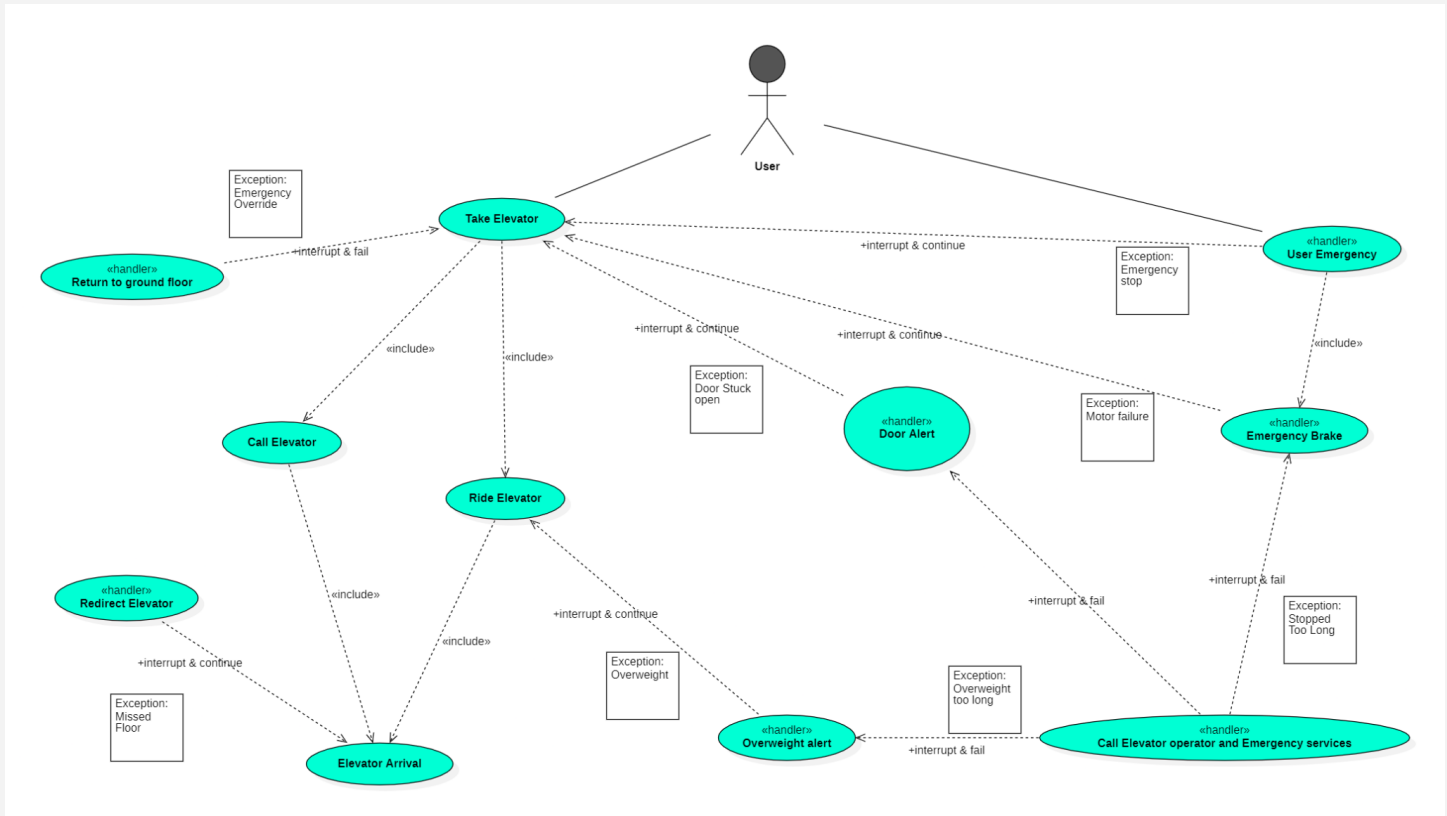
## Use Case Diagram



## Class Diagram

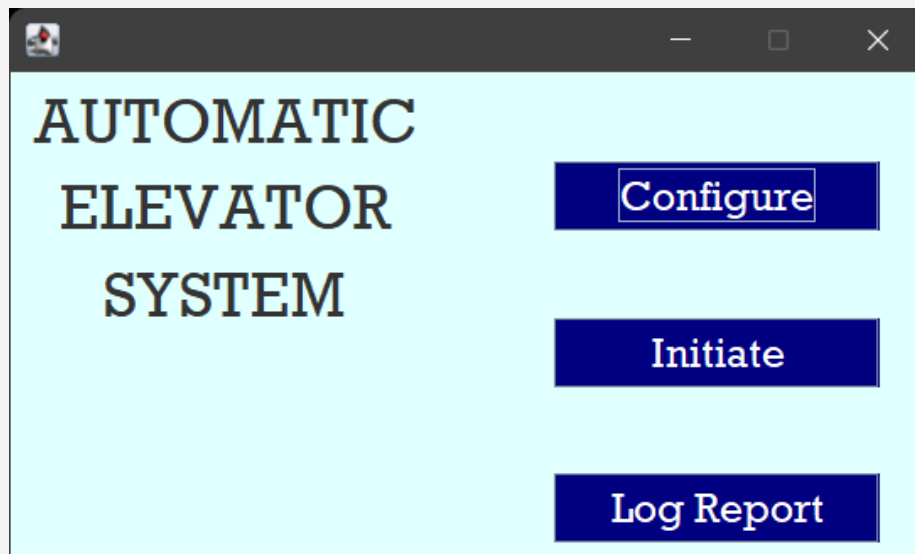


## UseCase Diagram



## PROJECT SIMULATION AND INSTRUCTIONS

When the project is executed, this is the first screen that appears:

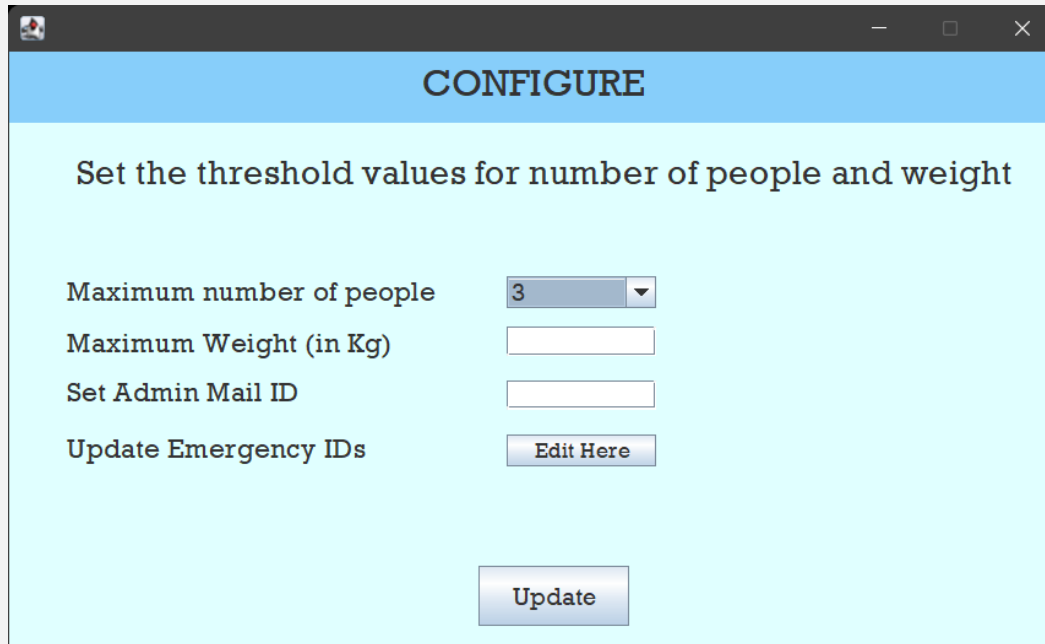


- First of all, the Admin is required to Configure the setting for the elevator. For this, click on the Configure button. Then the Configure window would open up, where the Admin can set the threshold values for Number of People and Weight.
- Also, Admin has to set a valid Email Id where the email will be sent in the case of Power Cut.

- Further, the Emergency IDs (without which emergency elevator requests cannot be called ) can be added or removed in the configure window.

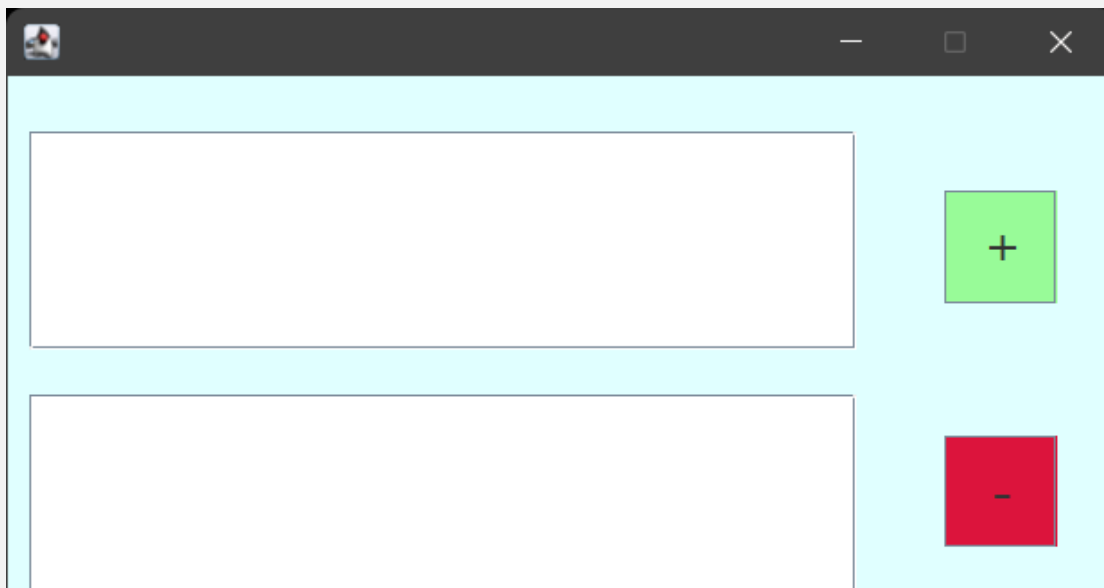
**See the steps below:**

## CONFIGURE SCREEN



The screenshot shows a web application window titled "CONFIGURE". Inside, there is a light blue header bar with the word "CONFIGURE" in bold. Below the header, the text "Set the threshold values for number of people and weight" is displayed. The form contains four input fields: "Maximum number of people" with a dropdown menu showing "3", "Maximum Weight (in Kg)" with a text input field, "Set Admin Mail ID" with a text input field, and "Update Emergency IDs" with a button labeled "Edit Here". At the bottom center, there is a button labeled "Update".

- There are validators set on Maximum weight and Mail ID.
- Mail Id is validated as well:
- Now let's add some emergency IDs( Their use will be made clear later ), Click on Edit Here. A window would open up.

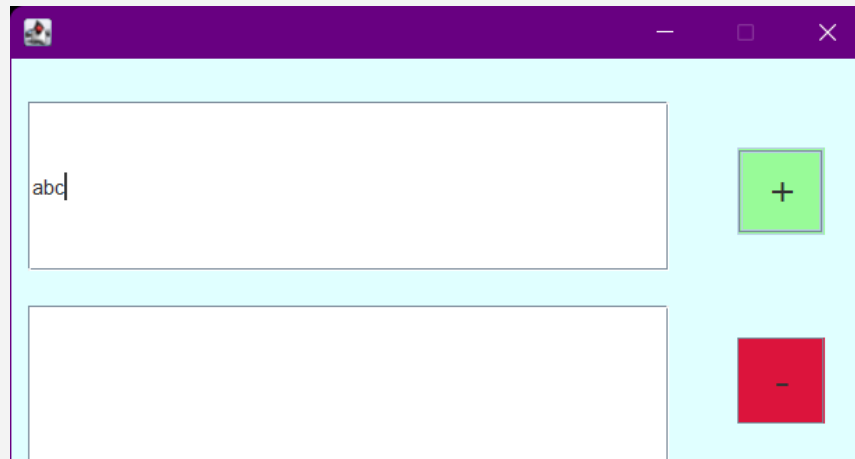


The screenshot shows a web application window for managing Emergency IDs. It features two large white text input fields stacked vertically. To the right of the top input field is a green square button with a white plus sign (+). To the right of the bottom input field is a red square button with a white minus sign (-).

To add new ID, enter the string and click on +

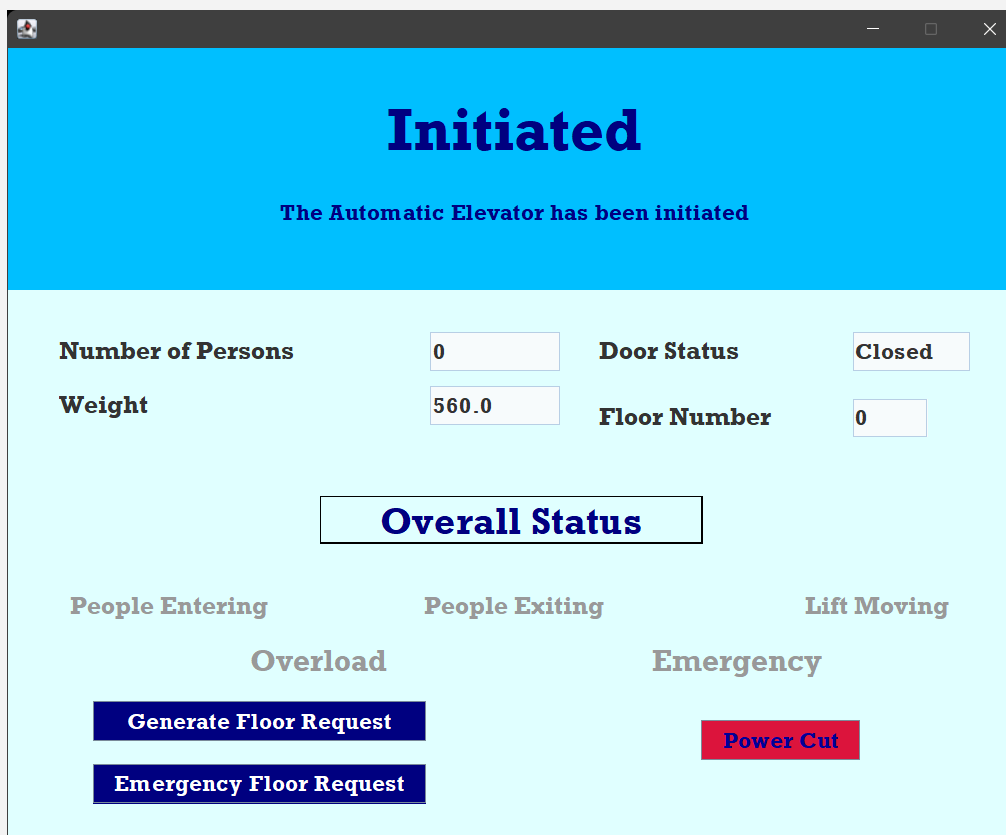
To remove an ID, select it and click on -

Now click on Update, and the information would be updated .



## INITIATE SCREEN

Now back in the main screen, Click on Initiate button to initiate the Automatic Elevator.



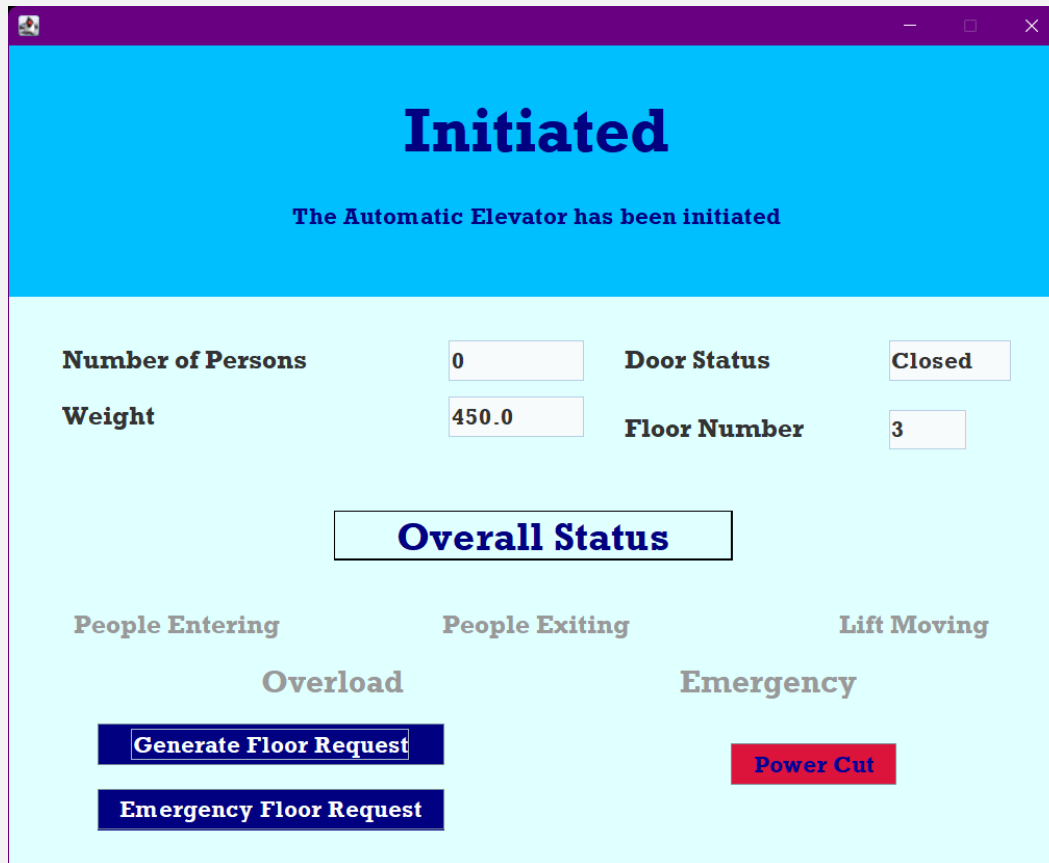
**We cannot initiate elevator before setting Admin's Mail Id.**

Here, you have two options :

- NORMAL REQUEST TO ELEVATOR
- Click on Generate Floor Request. You can see in the terminal, a random floor request would be generated. You can generate as many requests as you want, the

algorithm will take care of it accordingly. Let us generate three floor requests almost simultaneously and see how its taken care of (the floor requests can be seen in the terminal)

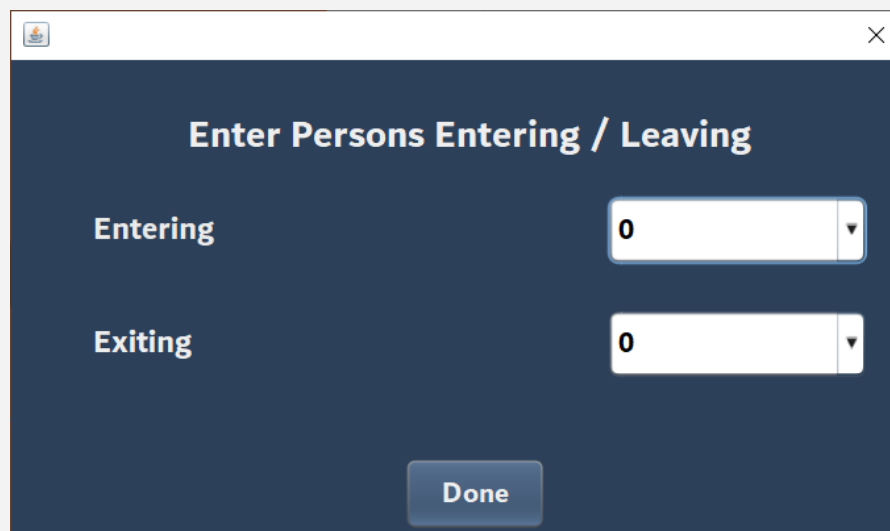
```
New Floor:9  
New Floor:12  
New Floor:0
```



The screenshot shows a web application window titled 'Initiated'. The header is blue with the text 'Initiated' in large white font, and 'The Automatic Elevator has been initiated' in smaller white font below it. The main content area has a light blue background. It contains several input fields and buttons:

- Number of Persons:** Input field with value '0'.
- Door Status:** Input field with value 'Closed'.
- Weight:** Input field with value '450.0'.
- Floor Number:** Input field with value '3'.
- Overall Status:** A button with the text 'Overall Status'.
- People Entering:** A label above an 'Overload' button.
- People Exiting:** A label above an 'Emergency Floor Request' button.
- Lift Moving:** A label above a 'Power Cut' button.
- Emergency:** A label above a 'Generate Floor Request' button.

- The elevator reaches floor 9 first, now you are prompted with a screen:



The screenshot shows a web application window titled 'Enter Persons Entering / Leaving'. The background is dark blue. It contains two input fields and a button:

- Entering:** Input field with value '0'.
- Exiting:** Input field with value '0'.
- Done:** A button at the bottom.

- We enter 1 person (person's weight is randomly added ), now the destination floor for this person would also be randomly generated (in this case 0) This floor



is also added to our elevator queue and next requests are served similarly Elevator first goes to floor 12 (as it was going up previously), then 0.

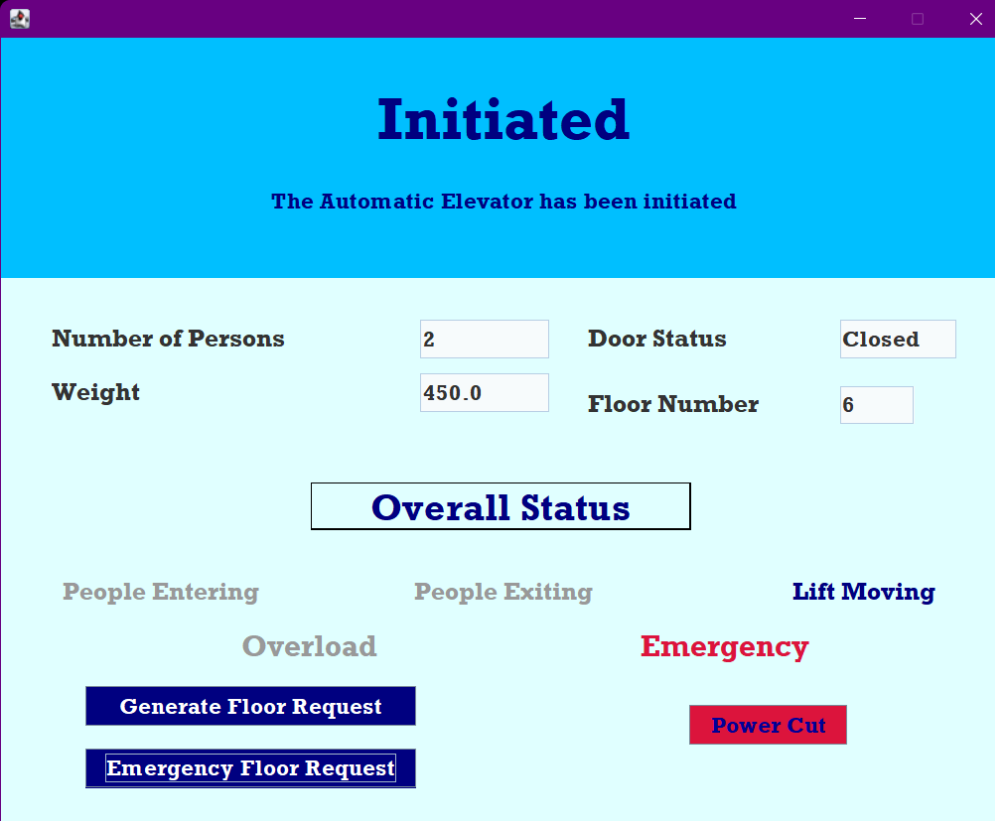
- The overall status of Elevator is also updated according to the situation. See an example below:

The screenshot shows a web-based interface for an elevator system. At the top, a blue banner displays the word "Initiated" in large, bold, black letters, with the subtitle "The Automatic Elevator has been initiated" below it. Below the banner, the interface is divided into several sections. On the left, there are two input fields: "Number of Persons" with the value "2" and "Weight" with the value "450.0". On the right, there are two more input fields: "Door Status" with the value "Closed" and "Floor Number" with the value "4". In the center, there is a button labeled "Overall Status". Below this, there are three status indicators: "People Entering", "People Exiting", and "Lift Moving". Under "People Entering", there is a button labeled "Generate Floor Request". Under "People Exiting", there is a button labeled "Emergency Floor Request". Under "Lift Moving", there is a button labeled "Power Cut".

- Now let us set max people to 10 and max weight to 500 (and cause a condition of overload )

Also, while overload, there is a constant alert sound, until you remove a certain number of persons so that it is not overloaded now. The doors will also remain open until then.

- EMERGENCY FLOOR REQUEST
- This is a new feature. Let's say there is an emergency, (you can call it by clicking Emergency Floor Request ) .
- This is where those Emergency IDs will be used. To validate an emergency request, you need an ID.




**Initiated**

The Automatic Elevator has been initiated

Number of Persons	<input type="text" value="2"/>	Door Status	<input type="text" value="Closed"/>
Weight	<input type="text" value="450.0"/>	Floor Number	<input type="text" value="6"/>

**Overall Status**

People Entering	People Exiting	Lift Moving
Overload		Emergency
<input type="button" value="Generate Floor Request"/>		<input type="button" value="Power Cut"/>
<input type="button" value="Emergency Floor Request"/>		



**Validate Emergency, Enter your ID:**

**Not Valid !**

- As soon an emergency is called, the elevator ignores the normal requests and first completes the emergency request. Now, to simulate the POWER CUT, there is a Toggle Button named Power Cut, click on it.
- A Power Cut has occurred now, to see how the elevator responds, see the following situation:
- We have added our mail id as Admin mail in configure. There is a request at floor 9 Let us click POWER CUT on its way from floor 5 to floor 6

<b>Number of Persons</b>	<input type="text" value="0"/>	<b>Door Status</b>	<input type="text" value="Closed"/>
<b>Weight</b>	<input type="text" value="560.0"/>	<b>Floor Number</b>	<input type="text" value="0"/>

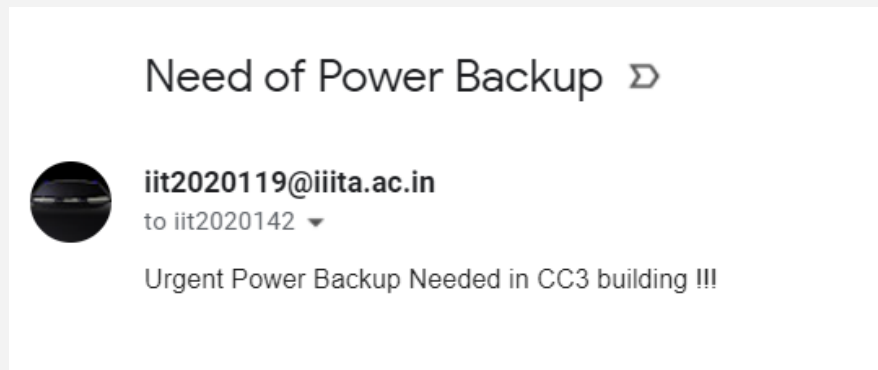
  

**Overall Status**

People Entering	People Exiting	Lift Moving
Overload	Emergency	
<div style="background-color: #000080; color: white; padding: 5px; margin: 5px auto; width: 100%;">Generate Floor Request</div> <div style="background-color: #000080; color: white; padding: 5px; margin: 5px auto; width: 100%;">Emergency Floor Request</div>	<div style="background-color: #ff0000; color: white; padding: 5px; margin: 5px auto; width: 100%;">Power Cut</div>	

- An email is sent at that address:



- When we release the POWER CUT button, the elevator goes to floor 6, rather than 9 because it is the nearest floor as of now and there was a Power Cut.

## LOG SCREEN

On the main screen, click on the Log Button

The image shows a web application window titled "Log Report". It has a blue header bar with the text "Log Report" in white. Below the header, there are two input fields labeled "From" and "To", each with a calendar icon. Below these fields is a large text area with the placeholder text "Set Valid Date".

You first need to set a valid date:  
The Log is now generated:

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Log Report

From

28-04-2022

To

30-04-2022

28-04-2022 03:31:38 :	Floor Number 8	Enters 4	Exits 0	Weight 361.8
28-04-2022 03:31:44 :	Floor Number 7	Enters 1	Exits 0	Weight 509.49
28-04-2022 03:40:17 :	Floor Number 2	Enters 0	Exits 0	Weight 0.0
29-04-2022 02:28:36 :	Floor Number 7	Enters 2	Exits 0	Weight 281.33
29-04-2022 02:28:43 :	Floor Number 6	Enters 1	Exits 0	Weight 399.91
29-04-2022 02:28:50 :	Floor Number 7	Enters 0	Exits 1	Weight 258.7
29-04-2022 02:29:37 :	Floor Number 4	Enters 0	Exits 0	Weight 258.7

There are validation checks on Date as well:

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□

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Log Report

From

23390

To

1234r

Set Valid Date

## **FUTURE SCOPE**

Following the new feature of Emergency Requests, we can incorporate a mechanism for ID cards using “Scan and Go” rather than entering IDs for verification every time. Also, once this mechanism is in place, it can further be used to add a new feature in the Elevator System for restricted floors for Staff Personnel only, using their staff ID Cards.