

# **SYSC3303 Group A1-2 Report**

## **Members:**

Jad Hamzeh,

Ilyas Hussein,

Firas El-Ezzi,

Jake Swann

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# 1.0 BREAKDOWN OF RESPONSIBILITIES

It was crucial that we clearly identified and assigned tasks to each team member to manage our project properly and guarantee its success. The main duties and obligations are described in this breakdown of responsibility. We aimed to improve productivity, workflow, and meet project deadlines by clearly defining these duties.

## 1.1 Jad Hamzeh

- Created diagrams for all iterations.
- Designed code for the door, arrival sensor, and lights for the floors and elevators.
- Responsible for organizing group meetings.
- Conducted a final review of the iterations before submitting.
- Handled the code for moving the elevator between floors.
- Handled the code for keeping track of the elapsed time.

## 1.2 Ilyas Hussein

- Designed the floor subsystem and ensured packets were sent correctly to the scheduler.
- Parsed the input file and prepared the requests to be sent via the floor subsystem.
- Developed tests for the floor and the parser.
- Error Handling for hard faults.

## 1.3 Firas El-Ezzi

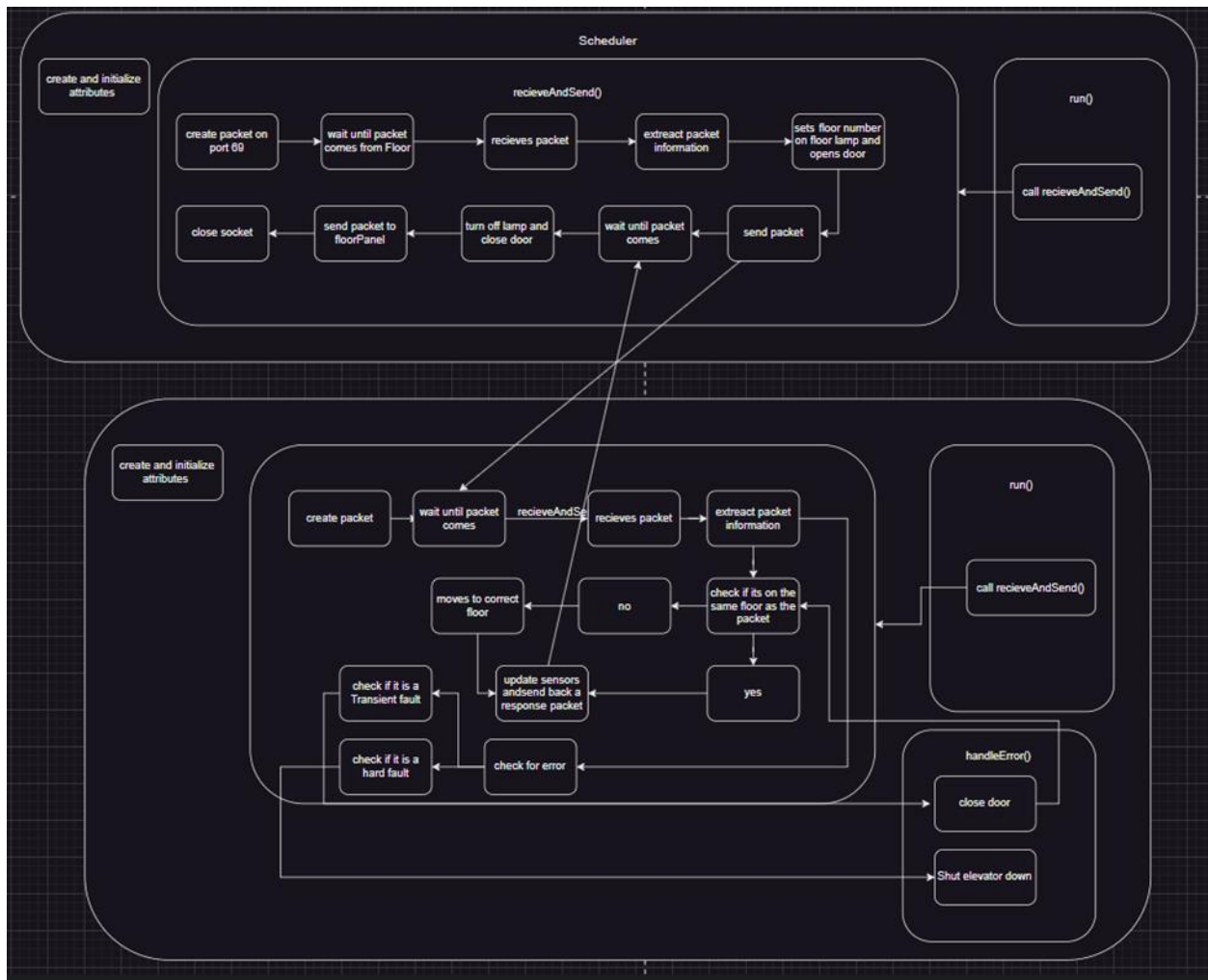
- Handled the confirmation packet from the elevator and ensured it reached the scheduler.
- Sent the confirmation packet that was received in the scheduler to the floor subsystem.
- Handled the function that ensured that any elevator with a hard fault would not be selected ever again.
- Distributed work load between any working elevators if there were to be a fault in any of the elevators to ensure that the system is still operational.

## 1.4 Jake Swann

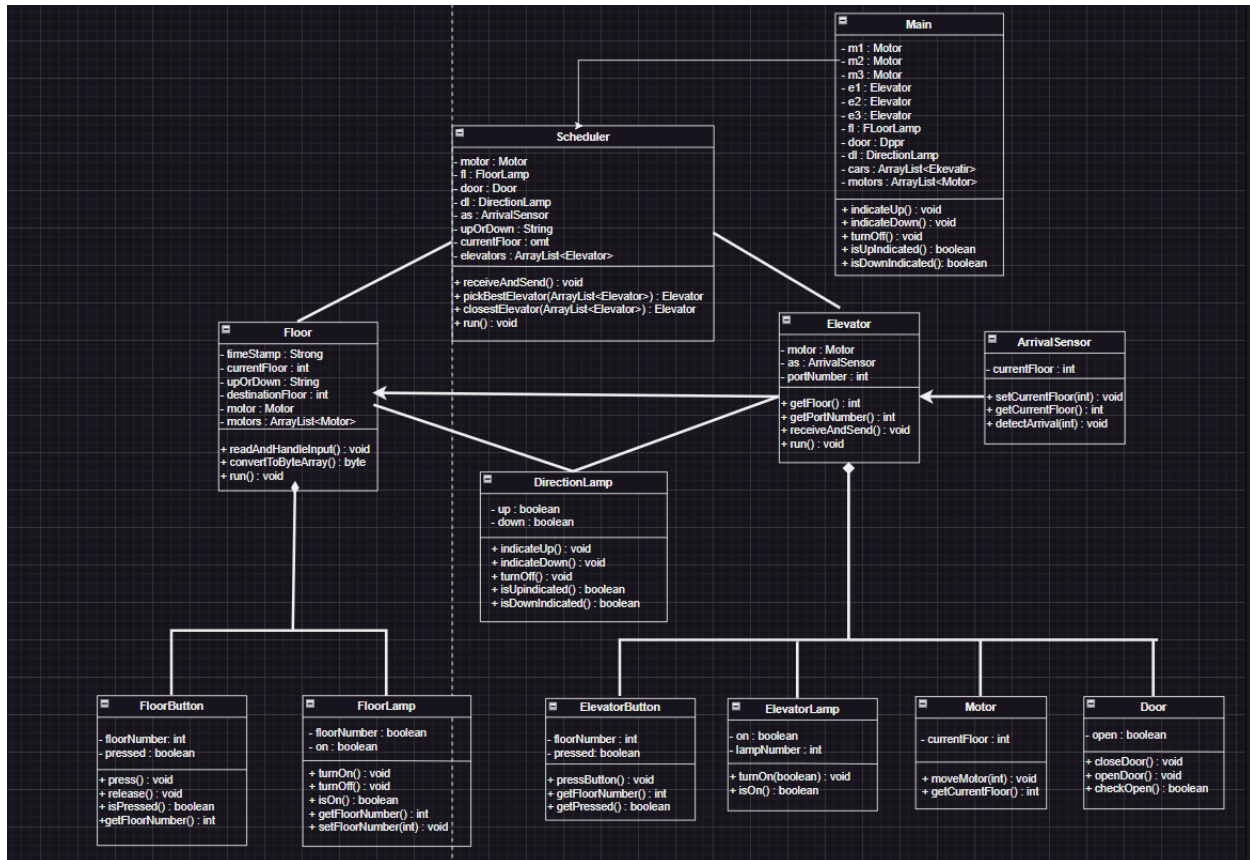
- Designed the scheduler subsystem and ensured packets were received from the Floor.
- Processed the packets received from the floor and picked the elevator that would result in the most efficient time (sent a packet to the best elevator containing the user's request).
- Designed the elevator subsystem and received packets containing all the user requests.
- Error handling for transient faults.

## 2.0 UML DIAGRAMS

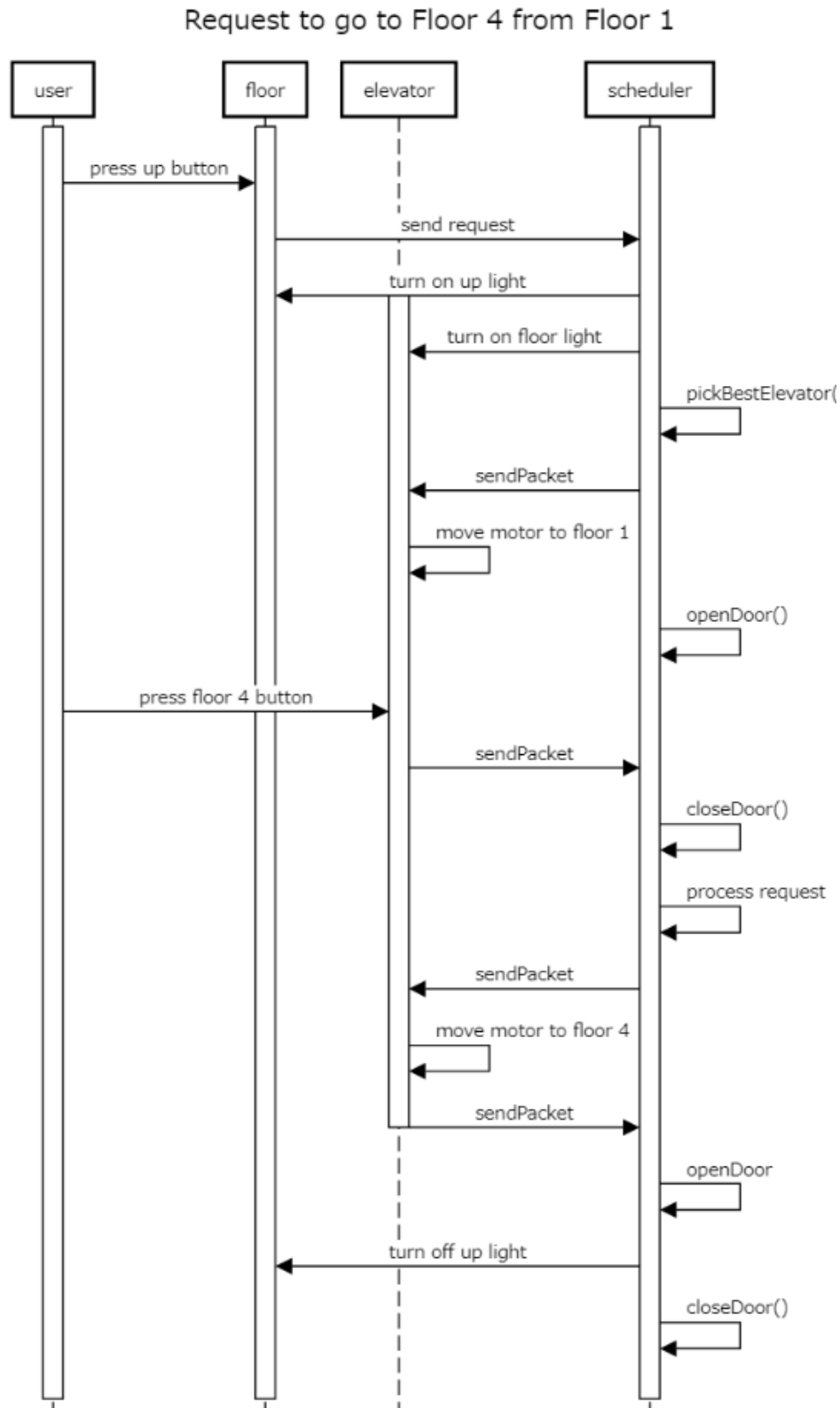
### 2.1 State diagram for elevator and scheduler subsystem



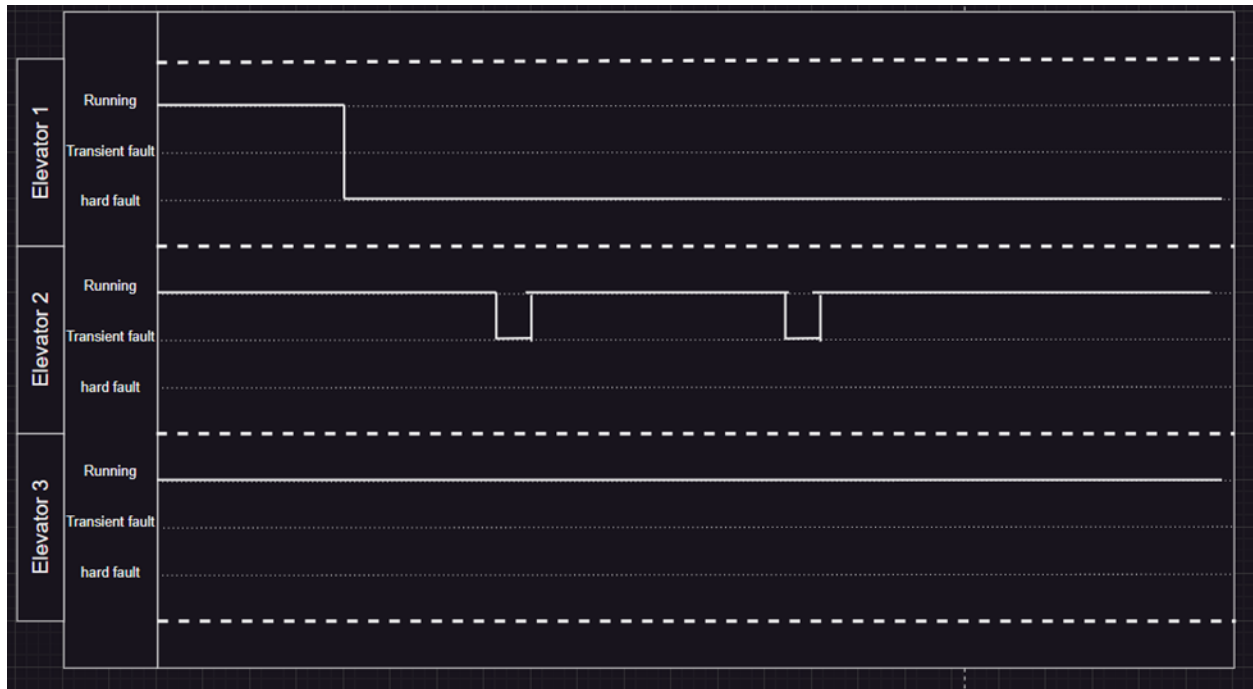
## 2.2 UML class diagram



## 2.3 Sequence diagram



## 2.4 Timing diagram



## 3.0 INSTRUCTIONS FOR SET UP RUNNING AND TESTING

Using IntelliJ:

1. Before running, ensure that 'iteration5\_input\_v1.txt' is in the correct folder (In the Iteration 5 folder, not in the src folder). It has been observed to have been in the wrong folder when downloading the zipped folder.  
NOTE: If it does not work, get the relative path of the 'iteration5\_input\_v1.txt' and replace the 'PATH' constant at the top of Floor.java with that its path.
2. Run Main.java.

Using the terminal

1. Ensure the file is in the src folder unlike with IntelliJ.
2. Change the working directory to the src folder.
3. Execute these commands in order:
  1. `javac Main.java Scheduler.java Floor.java Elevator.java Door.java ArrivalSensor.java Motor.java View.java FloorLamp.java DirectionLamp.java`
  2. `java Main`

## 4.0 MEASUREMENT RESULTS FOR DETERMINING DOOR AND FLOOR MOVEMENT TIMES

This section of the report outlines all the measurements that the team had taken to ensure they received accurate and consistent results. Here are all the measurements for determining the time between floors, time from top to bottom, bottom to top, and loading and unloading times that were to be used in the simulation of the system:



## 4.1 Top to bottom times

TOP TO BOTTOM TIME - 4 PEOPLE		
Floor Numbers	Time	
1 to 2	17.61	Mean: 16.67
2 to 3	16.41	
3 to 4	16.92	Variance: 0.31996
4 to 5	16.73	
5 to 6	15.96	Confidence: 16.076, 17.26
6 to 7	16.39	
TOP TO BOTTOM TIME - 3 PEOPLE		
Floor Numbers	Time	
1 to 2	17.02	Mean: 16.89333333
2 to 3	16.83	
3 to 4	16.97	Variance: 0.430826667
4 to 5	17.23	
5 to 6	15.68	Confidence: 16.21, 17.58
6 to 7	17.63	
TOP TO BOTTOM TIME - 2 PEOPLE		
Floor Numbers	Time	
1 to 2	17.76	Mean: 17.46
2 to 3	17.04	
3 to 4	18.32	Variance: 0.25804
4 to 5	16.98	
5 to 6	17.43	Confidence: 16.93, 17.99
6 to 7	17.23	
TOP TO BOTTOM TIME - 1 PERSON		
Floor Numbers	Time	
1 to 2	15.52	Mean: 15.52333333
2 to 3	14.56	
3 to 4	15.98	Variance: 0.313466667
4 to 5	16.03	
5 to 6	15.23	Confidence: 14.93, 16.11
6 to 7	15.82	

## 4.2 Bottom to top times

BOTTOM TO TOP TIME - 4 PEOPLE		
Floor Numbers	Time	
1 to 2	17.67	Mean: 17.60333333
2 to 3	17.51	
3 to 4	17.62	Variance: 0.032546667
4 to 5	17.91	Confidence: 17.42, 17.79
5 to 6	17.38	
6 to 7	17.53	
BOTTOM TO TOP TIME - 3 PEOPLE		
Floor Numbers	Time	
1 to 2	16.73	Mean: 17.38
2 to 3	17.52	
3 to 4	17.25	Variance: 0.20232
4 to 5	17.63	Confidence: 16.91, 17.85
5 to 6	17.12	
6 to 7	18.03	
BOTTOM TO TOP TIME - 2 PEOPLE		
Floor Numbers	Time	
1 to 2	17.78	Mean: 17.47166667
2 to 3	17.27	
3 to 4	18.1	Variance: 0.193736667
4 to 5	17.53	Confidence: 17.01, 17.93
5 to 6	16.83	
6 to 7	17.32	
BOTTOM TO TOP TIME - 1 PERSON		
Floor Numbers	Time	
1 to 2	16.26	Mean: 17.075
2 to 3	19.23	
3 to 4	16.54	Variance: 1.23115
4 to 5	16.83	Confidence: 15.91, 18.24
5 to 6	17.21	
6 to 7	16.38	

### 4.3 Time between floors

TIME BETWEEN FLOORS - 4 PEOPLE (seconds)		
Floor Numbers	Time	
1 to 2	6.03	Mean: 6.205
2 to 3	6.44	
3 to 4	5.56	Variance: 0.12347
4 to 5	6.37	
5 to 6	6.41	Confidence: 5.84, 6.57
6 to 7	6.42	
TIME BETWEEN FLOORS - 3 PEOPLE (seconds)		
Floor Numbers	Time	
1 to 2	6.12	Mean: 6.235
2 to 3	6.33	
3 to 4	6.28	Variance: 0.03339
4 to 5	6.19	
5 to 6	5.98	Confidence: 6.04, 6.43
6 to 7	6.51	
TIME BETWEEN FLOORS - 2 PEOPLE (seconds)		
Floor Numbers	Time	
1 to 2	5.25	Mean: 5.928333333
2 to 3	5.65	
3 to 4	6.74	Variance: 0.466376667
4 to 5	6.38	
5 to 6	5.11	Confidence: 5.21, 6.65
6 to 7	6.44	
TIME BETWEEN FLOORS - 1 PERSON (seconds)		
Floor Numbers	Time	
1 to 2	5.12	Mean: 5.86
2 to 3	6.18	
3 to 4	5.49	Variance: 0.29456
4 to 5	6.23	
5 to 6	5.59	Confidence: 5.29, 6.43
6 to 7	6.55	

#### 4.4 Loading and unloading times

LOADING/UNLOADING TIMES - 4 PEOPLE		
Floor Numbers	Time	
1 to 2	9.8	Mean: 10.5
2 to 3	11.2	
3 to 4	10.1	Variance: 0.66
4 to 5	10.9	
5 to 6	9.5	Confidence: 9.64, 11.35
6 to 7	11.5	
LOADING/UNLOADING TIMES - 3 PEOPLE		
Floor Numbers	Time	
1 to 2	9.03	Mean: 9.561666667
2 to 3	9.8	
3 to 4	9.73	Variance: 0.770656667
4 to 5	10.21	
5 to 6	8.09	Confidence: 8.64, 10.48
6 to 7	10.51	
LOADING/UNLOADING TIMES - 2 PEOPLE		
Floor Numbers	Time	
1 to 2	8.5	Mean: 9.081666667
2 to 3	10.8	
3 to 4	9.1	Variance: 1.363856667
4 to 5	8.77	
5 to 6	9.9	Confidence: 7.86, 10.31
6 to 7	7.42	
LOADING/UNLOADING TIMES - 1 PERSON		
Floor Numbers	Time	
1 to 2	7.2	Mean: 7.991666667
2 to 3	8.64	
3 to 4	8.24	Variance: 0.231056667
4 to 5	7.98	
5 to 6	8.09	Confidence: 7.49, 8.49
6 to 7	7.8	

## 5.0 CONCLUSION

In conclusion, the breakdown of responsibilities ensured that each team member had a clear understanding of their role and contributed effectively to the project. Through this process, we not only managed to streamline our workflow and enhance productivity but also gained valuable insights into teamwork and project management.

The project provided an opportunity for us to learn and implement various technical concepts, such as scheduling threads and communicating between subsystems using UDP. These experiences helped us develop our skills in system design, networking, and concurrent programming.

Moreover, the comprehensive UML diagrams and instructions for setup, running, and testing facilitated better understanding and smoother execution of the project. They served as valuable tools for communication and collaboration, enabling us to work cohesively towards our common goal.

Overall, the project was not only a test of our technical abilities but also a valuable learning experience that allowed us to apply theoretical knowledge in a practical setting.