

Elevator Control System and Simulator

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Carleton University
Department of Systems and Computer Engineering
SYSC 3303A Real-Time Concurrent Systems Winter 2023
Iteration 4 – Adding Error Detection & Correction.
@version 1.0, 02/04/23
@version 2.0, 02/27/23
@version 3.0, 03/11/23
@version 4.0, 03/25/23

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Group 7 Members:

- * Ismail Zakaria
- * Liu Patrick
- * Nguyen Trong
- * Elmokdad Hussein
- * Ngo Huu Gia Bao

The distribution of work was coordinated using Atlassian Jira Software which can be viewed using this link: [ECSS](#) for quick reference – see APPENDIX A. Here below is a general summary:

Iteration 4:

- Trong:
 - Implemented encode & decode interfaces for data transfer objects
 - Implemented floor request dispatching at a relative offset time
- Bobby:
 - Refactored Scheduler subsystem, implemented event-driven state machine
 - Developed optimal elevator job assignment algorithm
 - Unit testing of the elevator, scheduler, & floor subsystems
- Hussein:
 - Implement multiple floors and elevators each running on separate threads
 - Updated messaging interface to use UDP instead of RPC
- Patrick:
 - Refactored Scheduler subsystem, implemented event-driven state machine
 - Developed network communication interfaces for the Scheduler subsystem
 - Validated elevator car shaft traversal algorithm
 - Class Diagrams for subsystems
- Zak:
 - Refactored Elevator subsystem, designed & implemented event-driven state machine

- Developed elevator car shaft traversal algorithm, added fault states and associated elevator behaviours

Iteration 3:

- Trong:
 - Implement Remote Procedure Calls using UDP
 - Implement distributed system processes
 - Documentation: Update class UML, sequence UML, Work Distribution Document, README
- Bobby:
 - Improve elevator traversal to each floor sequentially
 - Create UI integration with Static Model of Domain (buttons, sensors...)
- Hussein:
 - Implement multiple floors and elevators each running on separate threads
- Patrick:
 - Improved parser by sorting elevator request prior to sending to Floor
- Zak:
 - Elevator subsystem refactoring & design

Iteration 2:

- Trong: SchedulerState class, FloorState class, SchedulerStateTest, FloorStateTest class, and javadocs
- Bobby: FloorState class, README, refactoring, documentation
- Hussein: UI improvements, refactoring
- Patrick: Update Elevator Location feature, UML and State diagrams
- Zak: Proposing ideas, revisions


























































Iteration 1:

- Trong: Elevator class, README, UML class & sequence, refactoring
- Bobby: Scheduler class, README, UI logger
- Hussein: Floor class, FloorTest, ElevatorTest
- Patrick: Parser class, ElevatorRequest class, ParserTest, Exception class
- Zak: Integration of system and system testing, revisions

Everyone took part in major code reviews and approved pull requests.

APPENDIX A







































































































Iteration 3

	ECSS-78	Update Work Distribution Document	 Trong Nguyen	 Trong Nguyen	=	IN PROGRESS ▾	Unresolved	Mar 11, 2023	Mar 11, 2023
	ECSS-77	Update README	 Trong Nguyen	 Trong Nguyen	=	IN PROGRESS ▾	Unresolved	Mar 11, 2023	Mar 11, 2023
	ECSS-76	Update State Diagrams	 Trong Nguyen	 Trong Nguyen	=	DONE ▾	Done	Mar 11, 2023	Mar 11, 2023
	ECSS-75	Update Sequence UML	 Trong Nguyen	 Trong Nguyen	=	DONE ▾	Done	Mar 11, 2023	Mar 11, 2023
	ECSS-74	Update UML	 Trong Nguyen	 Trong Nguyen	=	DONE ▾	Done	Mar 11, 2023	Mar 11, 2023
	ECSS-73	Create method: sort elevatorRequest by time stamp before adding to arraylist	 Patrick Liu	 Patrick Liu	=	DONE ▾	Done	Mar 10, 2023	Mar 10, 2023
	ECSS-72	Implement distributed processes - method can be execute on different computers	 Trong Nguyen	 Trong Nguyen	=	DONE ▾	Done	Mar 5, 2023	Mar 10, 2023
	ECSS-71	Create method: Fill elevatorRequest String's timestamp position with 0s to 3 digits	 Patrick Liu	 Patrick Liu	=	DONE ▾	Done	Mar 5, 2023	Mar 5, 2023
	ECSS-70	Action for workflow and State	 Unassigned	 Bobby Ngo	=	TO DO ▾	Unresolved	Mar 5, 2023	Mar 5, 2023
	ECSS-69	Documentation	 Trong Nguyen	 Zakaria Ismail	⬆	IN PROGRESS ▾	Unresolved	Mar 1, 2023	Mar 11, 2023
	ECSS-68	Create multiple floors and elevators with each elevator being a separate thread	 Hussein El Mokdad	 Hussein El Mokdad	=	IN REVIEW ▾	Unresolved	Mar 1, 2023	Mar 5, 2023
	ECSS-67	Make the elevator move to each floor instead of teleporting	 Bobby Ngo	 Bobby Ngo	=	DONE ▾	Done	Mar 1, 2023	Mar 5, 2023
	ECSS-66	Define simple error handling	 Unassigned	 Trong Nguyen	⬇	TO DO ▾	Unresolved	Feb 27, 2023	Mar 1, 2023
	ECSS-65	Improve parser	 Patrick Liu	 Trong Nguyen	=	DONE ▾	Done	Feb 27, 2023	Mar 5, 2023
	ECSS-63	Implement scheduling sweeping algorithm + testing	 Zakaria Ismail	 Trong Nguyen	=	TO DO ▾	Unresolved	Feb 27, 2023	Mar 11, 2023
	ECSS-62	Console UI integration with Static Model of Domain	 Bobby Ngo	 Trong Nguyen	=	IN PROGRESS ▾	Unresolved	Feb 27, 2023	Mar 6, 2023
	ECSS-61	Implement Remote Procedure Calls between Classes	 Trong Nguyen	 Trong Nguyen	⬆	DONE ▾	Done	Feb 27, 2023	Mar 10, 2023
	ECSS-60	Data structure for reading timestamp events and input in the system	 Trong Nguyen	 Trong Nguyen	⬇	IN PROGRESS ▾	Unresolved	Feb 27, 2023	Mar 7, 2023
	ECSS-59	Iteration 3	 Unassigned	 Zakaria Ismail	⬆	TO DO ▾	Unresolved	Feb 22, 2023	Feb 22, 2023

Iteration 2

	ECSS-58	Javadocs + final edits	Unassigned	Trong Nguyen	IN REVIEW	Unresolved	Feb 23, 2023	Feb 23, 2023
	ECSS-57	Proposal to refactor Elevator state machine implementation	Unassigned	Zakaria Ismail	TO DO	Unresolved	Feb 22, 2023	Feb 22, 2023
	ECSS-56	Move Parser package into Floor package	Unassigned	Zakaria Ismail	DONE	Done	Feb 21, 2023	Feb 23, 2023
	ECSS-55	Sending Elevator Location back to the Scheduler After Reaching Stop State	Unassigned	Patrick Liu	DONE	Done	Feb 20, 2023	Feb 22, 2023
	ECSS-54	Improve Elevator State machine logic	Unassigned	Bobby Ngo	DONE	Done	Feb 20, 2023	Feb 22, 2023
	ECSS-52	Implement SchedulerState enum based on StateMachine diagram	Unassigned	Trong Nguyen	DONE	Done	Feb 18, 2023	Feb 21, 2023
	ECSS-51	Implement ElevatorState enum based on StateMachine diagram	Unassigned	Trong Nguyen	DONE	Done	Feb 18, 2023	Feb 21, 2023
	ECSS-50	SchedulerState - Unit testing state machine implementation	Trong Nguyen	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 20, 2023
	ECSS-49	ElevatorState - Unit Testing state machine implementation	Trong Nguyen	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 20, 2023
	ECSS-48	Unit testing - Iteration 2	Unassigned	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 20, 2023
	ECSS-47	ELEVATOR - State machine diagram	Trong Nguyen	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 20, 2023
	ECSS-46	SCHEDULER - State machine diagram	Trong Nguyen	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 20, 2023
	ECSS-45	README - update	Bobby Ngo	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 22, 2023
	ECSS-44	Distribution of Responsibilities	Bobby Ngo	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 22, 2023
	ECSS-43	UML Sequence Diagram - update	Patrick Liu	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 22, 2023
	ECSS-42	UML Class Diagram - update	Patrick Liu	Trong Nguyen	DONE	Done	Feb 8, 2023	Feb 22, 2023
	ECSS-41	Documentation - Iteration 2	Trong Nguyen	Trong Nguyen	IN PROGRESS	Unresolved	Feb 8, 2023	Feb 22, 2023
	ECSS-40	Update UML Class diagram	Bobby Ngo	Bobby Ngo	DONE	Done	Feb 4, 2023	Feb 4, 2023
	ECSS-39	Improve console logging UI	Hussein El Mokdad	Bobby Ngo	DONE	Done	Feb 4, 2023	Feb 22, 2023
	ECSS-38	Review the output logging and add improvements to the presentation if possible	Bobby Ngo	Zakaria Ismail	TO DO	Unresolved	Feb 4, 2023	Feb 4, 2023
	ECSS-37	Add sleep timer to allow the user to see the system interactions	Bobby Ngo	Zakaria Ismail	TO DO	Unresolved	Feb 4, 2023	Feb 4, 2023

Iteration 1

Type	Key ↑	Summary	Assignee	Reporter	P	Status	Resolution	Created	Updated
	ECSS-1	Setup tasks	 Bobby Ngo	 Bobby Ngo	=	DONE ✓	Done	Jan 15, 2023	Feb 3, 2023
	ECSS-2	Iteration 1 Implementation	 Unassigned	 Patrick Liu	=	TO DO ▾	Unresolved	Jan 18, 2023	Jan 25, 2023
	ECSS-4	Submit Iteration 1 on BrightSpace	 Trong Nguyen	 SYS3303 Project...	=	TO DO ▾	Unresolved	Jan 18, 2023	Feb 4, 2023
	ECSS-5	Elevator class	 Trong Nguyen	 SYS3303 Project...	=	DONE ✓	Done	Jan 18, 2023	Feb 2, 2023
	ECSS-6	Scheduler Class	 Bobby Ngo	 SYS3303 Project...	=	DONE ✓	Done	Jan 18, 2023	Jan 29, 2023
	ECSS-7	Floor class	 Hussein El Mokdad	 SYS3303 Project...	=	DONE ✓	Done	Jan 18, 2023	Jan 29, 2023
	ECSS-8	Complete README.txt	 Bobby Ngo	 SYS3303 Project...	=	IN REVIEW ▾	Unresolved	Jan 18, 2023	Feb 3, 2023
	ECSS-9	Iteration 1 - Breakdown of Responsibilities	 Trong Nguyen	 SYS3303 Project...	=	DONE ✓	Done	Jan 18, 2023	Feb 3, 2023
	ECSS-10	Iteration 1 - UML Class Diagram & Sequence Diagrams	 Trong Nguyen	 SYS3303 Project...	=	DONE ✓	Done	Jan 18, 2023	Feb 4, 2023
	ECSS-11	Verify JavaDoc & Meaningful Comments	 Trong Nguyen	 SYS3303 Project...	=	DONE ✓	Done	Jan 18, 2023	Feb 4, 2023
	ECSS-12	Verify Unit Testing for all Classes	 Trong Nguyen	 SYS3303 Project...	=	IN PROGRESS ▾	Unresolved	Jan 18, 2023	Feb 4, 2023
	ECSS-13	Initial Environment Setup	 Zakaria Ismail	 Zakaria Ismail	=	DONE ✓	Done	Jan 20, 2023	Jan 29, 2023
	ECSS-14	Configure CI/CD Automated Testing	 Unassigned	 Zakaria Ismail	≡	TO DO ▾	Unresolved	Jan 21, 2023	Jan 24, 2023
	ECSS-15	Iteration 0 Results Processing	 Trong Nguyen	 Zakaria Ismail	=	DONE ✓	Done	Jan 21, 2023	Feb 3, 2023
	ECSS-16	Configure Logging	 Unassigned	 Zakaria Ismail	≡	TO DO ▾	Unresolved	Jan 21, 2023	Jan 26, 2023
	ECSS-17	Input File Parser and Tests	 Patrick Liu	 Patrick Liu	^	DONE ✓	Done	Jan 23, 2023	Feb 2, 2023
	ECSS-18	Fix/Setup Relative Filepath for input.txt file	 Unassigned	 Zakaria Ismail	≡	DONE ✓	Done	Jan 24, 2023	Jan 29, 2023
	ECSS-19	Setup config.properties file to select input file	 Unassigned	 Zakaria Ismail	≡	TO DO ▾	Unresolved	Jan 24, 2023	Jan 26, 2023
	ECSS-20	Unit test main.parser.Parser class	 Patrick Liu	 Zakaria Ismail	=	DONE ✓	Done	Jan 24, 2023	Feb 3, 2023
	ECSS-21	Unit test main.java.dto.ElevatorRequest class	 Patrick Liu	 Zakaria Ismail	=	DONE ✓	Done	Jan 24, 2023	Feb 3, 2023
	ECSS-22	README file	 Trong Nguyen	 Bobby Ngo	=	IN PROGRESS ▾	Unresolved	Jan 25, 2023	Feb 3, 2023
	ECSS-23	Create DOCs folder and include UML files	 Hussein El Mokdad	 Hussein El Mokdad	=	DONE ✓	Done	Jan 25, 2023	Feb 4, 2023
	ECSS-24	.gitignore for IntelliJ	 Zakaria Ismail	 Zakaria Ismail	=	DONE ✓	Done	Jan 25, 2023	Jan 25, 2023
	ECSS-25	Setup custom exception class with centralized error messages and refactor exception throws	 Unassigned	 Zakaria Ismail	▾	TO DO ▾	Unresolved	Jan 26, 2023	Jan 26, 2023
	ECSS-26	Unit test main.java.floor.Floor class	 Unassigned	 Zakaria Ismail	=	DONE ✓	Done	Jan 29, 2023	Feb 3, 2023
	ECSS-27	Integrate Iteration 1 Components	 Unassigned	 Zakaria Ismail	^	TO DO ▾	Unresolved	Jan 29, 2023	Feb 3, 2023
	ECSS-28	Phase 1 Component Integration - Parser, Floor, Elevator, Scheduler	 Zakaria Ismail	 Zakaria Ismail	^	DONE ✓	Done	Jan 29, 2023	Feb 2, 2023
	ECSS-30	Bi-directional Communication Implementation	 Zakaria Ismail	 Zakaria Ismail	^	DONE ✓	Done	Feb 2, 2023	Feb 4, 2023
	ECSS-31	Iteration 2 setup	 Unassigned	 Trong Nguyen	=	TO DO ▾	Unresolved	Feb 3, 2023	Feb 3, 2023
	ECSS-32	Verify that program can read the input file and pass the data back and forth	 Zakaria Ismail	 Zakaria Ismail	^	IN PROGRESS ▾	Unresolved	Feb 3, 2023	Feb 4, 2023
	ECSS-33	Standardize string output to use String.format for variables instead of + concat	 Zakaria Ismail	 Zakaria Ismail	≡	TO DO ▾	Unresolved	Feb 3, 2023	Feb 4, 2023
	ECSS-34	Added some more content to the readme	 Unassigned	 Trong Nguyen	=	DONE ✓	Done	Feb 4, 2023	Feb 4, 2023
	ECSS-35	Implement remaining test cases (scheduler, floor, and elevator)	 Hussein El Mokdad	 Hussein El Mokdad	=	IN PROGRESS ▾	Unresolved	Feb 4, 2023	Feb 4, 2023
	ECSS-36	Documentation breakdown of the responsibilities of each team member for iteration 1	 Trong Nguyen	 Trong Nguyen	=	IN PROGRESS ▾	Unresolved	Feb 4, 2023	Feb 4, 2023