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| D:\My_Stuff\My Documents\University\Cources\F22\COMP3004\Assignments\Assignment1_Q2_useCase diagram.jpg |
| This is the handwritten version provided for Assignment 1, the above is just a better way of drwaing it. |

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**Note: to see the class diagram clearly, would you please zoom in to 180%.**

***This is an updated class diagram to reflect the physical implementation of the Elevator system.***

**You can change the number of floors and number of elevators by changing the variables**

**FLOORS and ELEVATORS in *elevatorcar.h***

**Sequence Diagrams**

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| **SD – Request an elevator** |
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| **Press Help Button** |
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| **Interrupt door closing** |
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| **Receive fire alarm signal** |
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| **Receive Overload alarm signal** |
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| **Receive a power out signal** |
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Sequence diagrams are based on the use cases done in assignment 1 and it is consistent with the classes in the class diagram.

**Traceability matrix**

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| --- | --- | --- | --- | --- | --- |
| **ID** | **Requirement** | **Related Use Case** | **Fulfilled by** | **Test** | **Description** |
| 1 | The application interface contains buttons, text boxes | N/A | MainWindow.ui | Run the simulator in Qt to observe the ui | Using Qt’s framework to build user interface. All buttons are clickable with the mouse |
| 2 | ECS start to fulfill a floor request | Use case 1 | cECS class, elevator control system | Fill the input text box with the floor number then press request elevator button | cECS will choose an elevator and move it to the requested floor.  All steps can be seen in application console output to verify the correctness of the procedure. |
| 3 | ECS closes door after 10 seconds | Use case 1 | Elevator Control System class  (cECS class) | Using the test #2 | It can be seen in the steps in test #2 |
| 4 | ECS stops the elevator at the requested floor at the top of the queue | Use case 1 | Elevator Control System class  (cECS class) | Using the test #2 | It can be seen in the steps in test #2 |
| 5 | ECS respond to passenger asking for help | Use case 2 | Elevator Control System class  (cECS class) | In System ui, press the Help button | All actions and steps to carry on the help procedure is displayed in the application console output for verification. |
| 6 | ECS prevents door form closing in case of an obstacle prevent door closing | Use case 3 | Elevator Control System class  (cECS class)  Door sensor class  (DoorSensor class) | In System ui,  Set value for floor number text box and a value for Elevator text box. Then press Interrupt Door button | All actions and steps to carry on the Door obstacle incident is displayed in the application console output for verification. |
| 7 | ECS sends sound warning and display a warning message if door can’t close | Use case 3 | Elevator Control System class  (cECS class)  Display class  Sound system class  (AudioSystem class) | In System ui,  Set value for floor number text box and a value for Elevator text box. Then press Interrupt Door button | All actions and steps to carry on the Door obstacle incident is displayed in the application console output for verification. |
| 8 | FireSensor sends signal to ECS when fire is detected | Use case 4 | Elevator Control System class  (cECS class)  FireSensor class | In System ui, press the Fire Detected button | All actions and steps to carry on the Fire procedure is displayed in the application console output for verification. |
| 9 | ECS moves elevators to a safe floor | Use case 4 | Elevator Control System class  (cECS class) | In System ui, press the Fire Detected button | All actions and steps to carry on the Fire procedure is displayed in the application console output for verification. |
| 10 | ECS sends text and audio messages to elevators | Use case 4 | Elevator Control System class  Display class  Audio system class | In System ui, press the Fire Detected button | All actions and steps to carry on the Fire procedure is displayed in the application console output for verification. |
| 11 | OverLoadSensor sends signal to ECS when weight overload is detected | Use case 5 | Elevator Control System class  OverLoadSensor class | In System ui,  Set value for floor number text box and a value for Elevator text box. Then press the Over Load Detected button | All actions and steps to carry on the Overload procedure is displayed in the application console output for verification. |
| 12 | ECS stops elevator from moving | Use case 5 | Elevator Control System class  (cECS class) | In System ui,  Set value for floor number text box and a value for Elevator text box. Then press the Over Load Detected button | All actions and steps to carry on the Overload procedure is displayed in the application console output for verification. |
| 13 | ECS sends text and audio messages to passengers in elevator to reduce load | Use case 5 | Elevator Control System class  Display class  Audio system class | In System ui,  Set value for floor number text box and a value for Elevator text box. Then press the Over Load Detected button | All actions and steps to carry on the Overload procedure is displayed in the application console output for verification. |
| 14 | Power Out Sensor sends signal to ECS when power outage is detected | Use case 6 | Elevator Control System class  PowerOutSensor class | In System ui, press the Power Out Detected button | All actions and steps to carry on the Power out procedure is displayed in the application console output for verification. |
| 15 | ECS moves elevators to a safe floor | Use case 6 | Elevator Control System class | In System ui, press the Power Out Detected button | All actions and steps to carry on the Power out procedure is displayed in the application console output for verification. |
| 16 | ECS sends text and audio messages to passengers in different elevators to disembark once the safe floor is reached. | Use case 6 | Elevator Control System class  Display class  AudioSystem class | In System ui, press the Power Out Detected button | All actions and steps to carry on the Power out procedure is displayed in the application console output for verification. |