

Project Description - An Access Control System

Thai Son Hoang and Stefan Hallerstede

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In this exercise, you should work in a group of 2-3 people to develop a model for an *access control system*. The requirements document is given in Section 1.

- Determine clearly the refinement strategy, that you will take.
- Requirement tracing is important (i.e. make clear how the requirements are ensured in the model).

1 Requirements Document

Our access control system consists of rooms, doors connecting these rooms, and people who move between the rooms.

EQP 1	The system consists of <i>rooms</i> , <i>doors</i> , and <i>people</i> .
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There is a special room called “hallway”.

EQP 2	We call a special room <i>hallway</i> .
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The rooms in the building are connected by doors.

EQP 3	A <i>door</i> connects two rooms.
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A door connects two rooms, but it never connects a room to itself. Moreover, the connection between rooms is symmetric. if a room 1 is connected with room 2, then vice-versa, the room 2 must be connected with room 1.

EQP 4	No door connects a room to itself.
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EQP 5	If a door connects room 1 with room 2, then it also connects room 2 with room 1.
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The hallway is connected to all rooms but itself.

EQP 6	The hallway is connected to all rooms but itself.
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A person is in at most one room of the building at a time.

FUN 7	A person is in at most one room.
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To enter a room in the building, people first go through the hallway. Vice-versa, people have to leave the building via the hallway.

FUN 8	A person enters and leaves the building via the hallway.
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Once inside the building, people can move from one room to another room connected to each other.

FUN 9	If a person is in room 1 and room 1 is connected with room 2, then the person can go to room 2.
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However, there are some authorisations that permit people to be in some rooms but not into others.

FUN 10	A person is allowed to be in certain rooms.
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For fire safety people must not get stuck in a room in building, not being able to leave the building.

FUN 11	Each person is able to leave the building.
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A critical property of the system is that there is no unauthorised access. In fact, this is somehow unrealistic: unauthorised access sometimes happens, even in prisons. We also leave it completely open how the access control is realized (keycards, fingerprints, RFID, guards, ...). See the following therefore as a simplification.

SAF 12	If a person is in a room, then she is authorized to be in that room.
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