

CS 580 Specification of Software Systems

Homework 07: Elevator system.

You are asked to develop a formal specification of the requirements for an elevator system consisting of a single cabin in a building with N floors. In addition to call buttons on each floor and request buttons inside the cabin, the system has access to the building's fire alarm.

Your report should be organized in the following manner:

1. Introduction
 - a. Introduce the elevator system and maybe include a picture that captures the relevant components.
 - b. State the goals of this report.
2. Abstract State Model
 - a. In order to develop a specification, you need to have a way to refer to the state of the system. In this section you need to model the control system as a set of abstract variables, e.g., the cabin might have a location and a motion status.
 - b. There is no need to describe in this section any constraints on how these variables may change over time except for the range of values they may assume.
3. Specification #1
 - a. Provide a highly abstract and minimal specification of the requirements the system must meet. Such a specification may need to address safety and service expectations.
 - b. In this section, please ignore the presence of the fire alarm and any requirements related to handling the fire alarm.
4. Specification #2
 - a. In this section you need to factor in the presence of the fire alarm and any requirements related to handling the fire emergency.
 - b. Please make sure to provide a complete specification, not merely a discussion of changes relative to the specification appearing in the previous section.
5. Specification #3
 - a. In this section please refine the specification above and make it more detailed and more prescriptive. As an example, you may choose to constrain the manner in which the elevator services passenger requests.
 - b. You should convince yourself that the specification in this section is a refinement of the one in the previous section.