

Alarm System Requirements

The alarm system is a software system that simulates a home alarm system. The user must be able to register alarm codes in the system. The system has a default alarm code of "1111" which can be removed only when another code has been registered. An alarm code consists of 4 digits (numeric). An alarm code can be removed from the system provided it is not the last code in the system.

The system initially has no sensors. The user can add an arbitrary number of sensors to the system. When a sensor is added, the user must specify its location. Only one sensor can be added to a given location. The user can open or close a sensor (for example, to simulate opening a door, the sensor on that door can be opened). When a sensor is opened or closed, it must notify the alarm system.

The user can arm the system using a keypad by entering a valid alarm code or they can press a single button on a remote control. The system cannot be armed if any of the sensors is open.

To disarm the system, the user must enter a valid alarm code on the control pad.

The alarm will sound if the system is armed and any of the sensors is opened. If the sensor is then closed, the alarm continues to ring. The only way to silence the alarm is to disarm the system.

If the alarm sounds, the system must simulate the ringing of the alarm by printing a message on the console. Other forms of notification may be added to the system in future.

The system must log the following events:

- system arm
- system disarm
- location of any sensor opened while system is armed
- add code including code added
- remove code including code removed
- add sensor including sensor location

The date and time of each event must also be logged. The user can print the event log to screen or to a file. The user can clear the event log.