

Exercise 1: Safehome system

Consider a security online system called safehome which is used for controlling alarms embedded in the home security system. We consider 3 actors: home owner, system administrator, sensors. The home owner interacts with the system either by the alarm control panel or a pc.

The SafeHome security function enables the homeowner to configure the security system when it is installed, monitors all sensors connected to the security system, and interacts with the homeowner through the Internet, a PC, or a control panel.

During installation, the SafeHome PC is used to program and configure the system. Each sensor is assigned a number and type, a master password is programmed for arming and disarming the system, and telephone number(s) are input for dialing when a sensor event occurs.

When a sensor event is recognized, the software invokes an audible alarm attached to system. After a delay time that is specified by the homeowner during system configuration activities, the software dials a telephone number of a monitoring service, provides information about the location, reporting the nature of the event that has been detected. The telephone number will be redialed every 20 seconds until telephone connection is obtained.

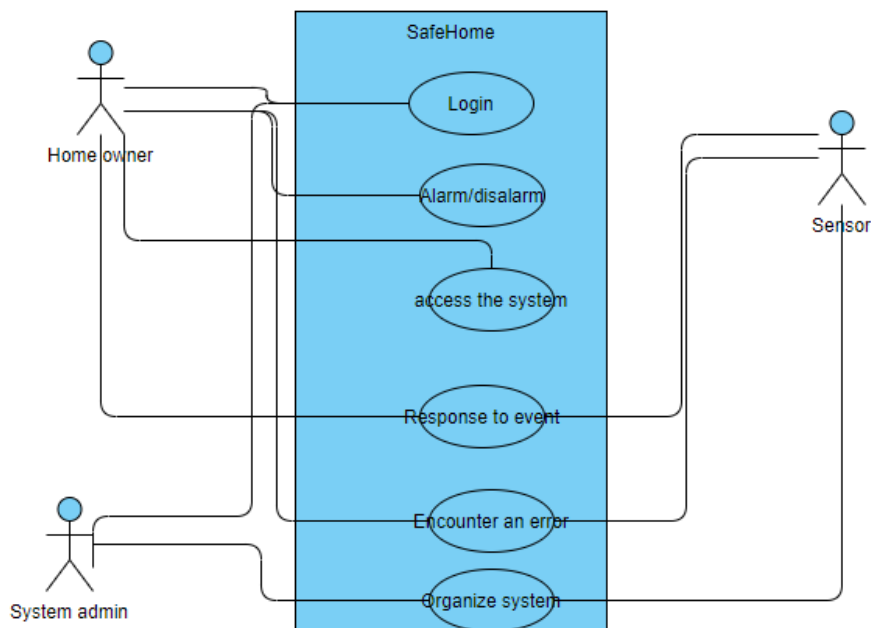
The homeowner receives security information via a control panel, the PC, or a browser, collectively called an interface. The interface displays prompting messages and system status information on the control panel, the PC ,or the browser window.

- Functions of home owner
 - Login
 - Arms/disarms the system
 - Access the system via internet
 - Responds to alarm event
 - Encounter an error condition
- Functions of system administrator
 - Login

- Organize sensors and related system features
- Functions of sensors
 - Responds to alarm event
 - Encounter an error condition
 - Organize sensors and related system features
- Login Scenario described by stakeholder:

I'd log on to a website and provide my user ID and two levels of passwords. After I enter the passwords, a screen representing all SafeHome functions will appear. I'd select the home security function. The system might request that I verify who I am, say, by asking for my address or phone number or something. It would then display a picture of the security system control panel, along with a list of functions that I can perform—arm the system, disarm the system, disarm one or more sensors. I suppose it might also allow me to reconfigure security zones and other things like that, but I'm not sure.

- Draw use case diagram for the safehome security function



- Write the usecase table for the home owner function (login, Responds to alarm event)

Use case name:	Login	
Primary actor:	Home owner, system admin	
Goal:	Access the online system	
Precondition:	-	
Trigger:	Allow the user to access the system from the website using his username and password to be able to control his functions	
Scenario	actor	system
	Access website	
	Click login	
		Display login page and ask for username and password
	Enter Id and password	
		Check validity of username and password
		If valid request the second password
	Enter second password	
		Check validity of second password
		If valid a screen representing all SafeHome functions will appear
	select the home security function	
		The system requests other validation (phone number. Address)
	The user enters phone number and address	
		The system validate the entered information
		If valid, the system displays a picture of the security system control panel. along with a list of functions
Exception:	Forget password: ask the user to enter his ID then send mail with the link of update password and a key to change password	

	Invalid username/password: display invalid message and ask the user to reenter his user name and password (If entered 3 times incorrectly lock the user for 4 hours)

name	Response to alarm event	
actor	sensor	
precondition	An event occur	
scenario	actor	system
	Sensor detects an event	
	Send alert to the system	
		Invoke an audible alarm
		Request information
	Send information about location, and the nature of the event	
		After specific delay time the system dial the telephone number of the monitoring service
		Report the information to the user

Exercise 3: **Library System**

- Consider a small library management which supports the following functionalities:
 1. Check out a copy of a book. Return a copy of a book.
 2. Put a book on hold if already borrowed.
 3. Add a copy of a book to the library. Remove a copy of a book from the library.
 4. Browse the list of books using different filtering sorting criteria.
 5. Find out the list of books currently checked out by a particular borrower.
 6. Check users' personal information.
 7. Suspend a user.
 8. Set borrowing rules.
- There are two types of users: staff users and ordinary borrowers. Staff are divided into two categories: Librarians and Assistants.
- A library user can do tasks 2, 4, 5 and 6. But he can do 5 and 6 only on his own records.
- An assistant can 1, 2, 4, 5, 6 and 7
- A librarian can do all the tasks.
- There could be multiple copies of the same book.
- No copy of the book may be both available and checked out at the same time.
- A borrower may not have more than a predefined limit on the number of books checked out at one time.
- Putting a hold on a borrowed book, will give priority to borrow it when it comes.

a. Draw usecase Diagram

