

CECS543 – Advanced Software Engineering

Assignment 1

Due: Sep 14, 2021

Objective:

This assignment is mainly about “Requirement Analysis” and will consist different stages to produce a partial requirements document for a given scenario based on a “Proposed home security and safety system” detailed on this document.

Tasks:

The two tasks refer to the scenario outlined here (you should read the scenario first carefully). You may make some reasonable assumptions about how the system should work (without inventing new functionality). Also note that there is no “right answer” to modelling a system, different solutions can be equally good!

It may be helpful to refer to the course textbooks “Software Engineering”, Addison-Wesley, by I. Sommerville and “Using UML”, Addison-Wesley, by P. Stevens.

Task 1:

All tasks for this assignment refer to the given scenario “proposed home security and safety system”

Produce a UML use-case model (i.e., BOTH a use-case diagram and use-case descriptions) and identify as many actors as you can in your model that are within the scope of the system. For the use-case diagram part of the model, you may use any method to draw it, including a software or hand-drawn diagram. There are also plethora of online applications and websites that may make whole process easier (e.g app.genmymodel.com).

For the model diagram if you find it difficult keeping it looking good on 1 diagram, feel free to split it into multiple diagrams. This is encouraged if it has become difficult to read. Keep all text easy to read and all fonts at least 14pt.

For use cases follow the recommendations given in the lecture notes.

Use case descriptions: For each use case include a use case description, this should follow the use case description form layout as shown in supplementary note.

Task 2:

Identify five non-functional and verifiable requirements of the “proposed home security and safety system” below, using the description of the scenario (you can make some assumptions about the system not detailed in the requirement description). For the requirements propose a mechanism and appropriate criteria for making them verifiable. So, all the requirements you list need to have a technique to objectively test them.

Proposed home safety and security

Your company has been commissioned to design a home safety and security system.

This system is designed to protect to the householder against: Fire, Break in, Flood

The system will act as a fire alarm, a flood alarm and a burglar alarm all integrated into 1 package. To enable this to happen the system will connect to:

Smoke sensors (fire) Heat sensors (fire)

Door, window and movement sensors (to detect break in)

Water sensors (flood)

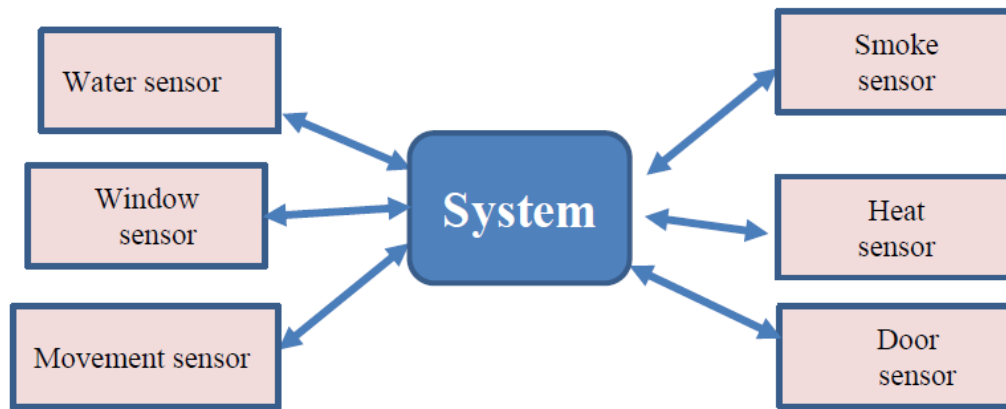
The system has a key pad and a simple alphanumeric display.

The system is fitted with a wireless network card which allows it to connect to the internet and be controlled by the user via a smart phone application or web interface. The system has an alarm with 3 different tones, depending on the type of alarm (fire, break in or flood). The user has a code which they type into the machine to stop the alarm or change settings. Each sensor input needs configuring as a smoke, heat, door, window, movement or water sensor but the system should also work with smart sensors which send a code which indicates what type of sensor is attached when the system sends a set up message. Every sensors can be enabled or disabled from the main console, it is also possible to set times of the day when different burglar sensors (door/window) can be enabled or disabled.

The burglar alarm function can be armed or disarmed automatically depending on the time of day. The fire and flood alarm function cannot be disabled.

Smoke detectors will sound a "smoke" alarm if they detect smoke but a fire will only be confirmed and alarmed by the system if they indicate smoke 3 times in 1 minute.

The heat detectors will sound an alarm and indicate a fire as soon as they detect excess heat. If the door, window or movement sensors activate the user has a user configurable amount of time to reset the system before the burglar alarm is sounded. All functions of the system can be configured via the smart phone application or web interface. The remote interface has a username and password. For the fire alarm, if the fire alarm has not been reset after 15 minutes the system can be configured to call the fire station(911?). For the burglar alarm if the system has not been reset the system can be configured to call the police.



Marking Criteria

Part	A++ to A 70%+	B 60-69%	C 50-59	D 40-49	E+ 35-39	E- to G <35
1	Correct notation used throughout, well chosen set of use cases and all case descriptions present.	Good set of use cases but some descriptions missing or minor case missing or some minor notation problems	Poor set of use cases or significant problems with notation. Level of detail not sufficient for problem	Some critical use cases missing or use case descriptions missing.	Shows some correct requirements analysis of the problem.	No clear evidence that the requirements have been understood at all or no clear attempt at use case diagram or descriptions.
2	All non functional elements identified and verification explained.	Good answers but confusion between functional and non-functional requirements.	Missing one or more non-functional requirements.	Missing up to three requirement descriptions.	Only 2 or 3 correct requirement present or incorrectly categorised.	Requirements don't make sense.