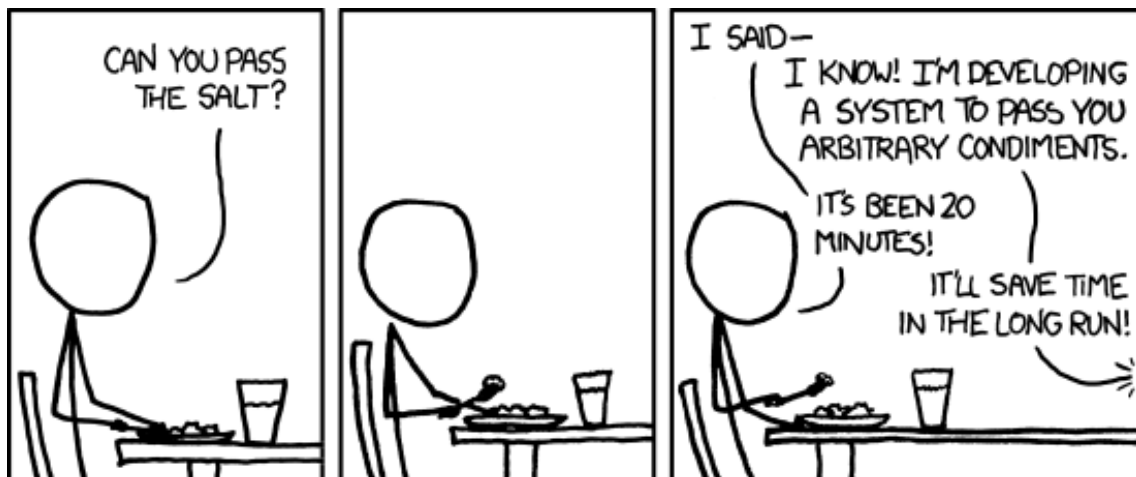


Swimming Pool Automated Checking System

CITS4401 Software Requirements and Design - Practical Assignment

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1 Introduction

The Swimming Pool Automated Checking System (SPACS) helps to keep track of and assist in the upkeep of private swimming pools. This document outlines the design of the SPACS system to ensure that it meets all the requirements. It can also be used as a reference guide by anyone developing the SPACS system.

1.1 Terms

Below are a list of terms and abbreviations used in this document and their definitions.

PTU	Pool Testing Unit
SPACS	Swimming Pool Automated Checking System

2 Use Case Diagram



Figure 1: use case diagram outlining the main uses for the system

Name	regularUpdate
Actors	PoolTestingUnit
Goal	store collected information from the PTU in the system
Preconditions	PoolTestingUnit is authenticated
Basic Flow	<ol style="list-style-type: none"> 1. Use case starts when ptu sends data 2. validate data 3. store it so that it can be used later 4. The use case ends
Alternative Flow	<ol style="list-style-type: none"> 1. Data is malformed <ol style="list-style-type: none"> (a) Recieved data is logged for analysis 2. Issue storing data <ol style="list-style-type: none"> (a) Fall back to logging data and alert the administrator
Postconditions	<ol style="list-style-type: none"> 1. Success: Data has been stored 2. Failure: Data has been stored in a log for analysis by admin

Name	urgentUpdate
Actors	PoolTestingUnit, PoolShopAdministrator, PoolOwner
Goal	store collected information from the PTU in the system and alert the pool owner and pool shop that there is a problem
Preconditions	PoolTestingUnit is authenticated
Basic Flow	<ol style="list-style-type: none"> 1. use case starts when ptu sends data with alerts 2. validate data 3. store it so that it can be used later 4. email is sent to the PoolShopOwner and PoolOwner 5. the use case ends
Alternative Flow	<ol style="list-style-type: none"> 1. Data is malformed <ol style="list-style-type: none"> (a) Recieved data is logged for analysis 2. Issue storing data <ol style="list-style-type: none"> (a) Fall back to logging data and alert the administrator 3. Email fails <ol style="list-style-type: none"> (a) Email gets retried and event is logged
Postconditions	<ol style="list-style-type: none"> 1. Success: Data has been stored, email has been sent to Pool-ShopOwner and PoolOwner 2. Failure: Data has been stored in a log for analysis by admin

Name	generateReport
Actors	PoolOwner, PoolShopAdministrator
Goal	provide latest data to
Preconditions	First week of the PTU or a month since the last report
Basic Flow	<ol style="list-style-type: none"> 1. use case starts at the same time every day 2. gets a list of pools that need reports 3. for each pool 4. gets the information that should be on the report 5. generates the report as a pdf 6. emails it off
Alternative Flow	
Postconditions	<ol style="list-style-type: none"> 1. Success: Report generated and emailed to pool owner and pool shop 2. Failure: Any errors logged for admin to look over

Name	addPoolShop
Actors	Administrator
Goal	To add a pool shop to the system.
Preconditions	
Basic Flow	<ol style="list-style-type: none"> 1. Administrative user enters information about the pool shop
Alternative Flow	- Invalid Information - Error displayed and user is able to re-enter
Postconditions	Success: Data is stored and can be retrieved later Failure: User is given achance to modify data

Name	editPoolShop
Actors	Administrator
Goal	To edit a pool shop in the system.
Preconditions	
Basic Flow	<ol style="list-style-type: none"> 1. Administrative user enters updated information about the pool shop
Alternative Flow	<ol style="list-style-type: none"> 1. Invalid Information <ol style="list-style-type: none"> (a) Error displayed and user is able to re-enter
Postconditions	<ol style="list-style-type: none"> 1. Success: Data is stored and can be retrieved later 2. Failure: User is given achance to modify data

Name	removePoolShop
Actors	Administrator
Goal	To remove a pool shop from the system.
Preconditions	
Basic Flow	<ol style="list-style-type: none"> 1. Administrative selects the pool shop 2. Confirms that the pool shop should be disabled
Alternative Flow	<ol style="list-style-type: none"> 1. Cancelled <ol style="list-style-type: none"> (a) No change is made
Postconditions	<ol style="list-style-type: none"> 1. Success: Data is no longer accessible. User no longer able to log in 2. Failure: No change

Name	addPool
Actors	PoolShopAdministrator
Goal	To add a pool to the system.
Preconditions	
Basic Flow	
Alternative Flow	
Postconditions	

Name	editPool
Actors	PoolShopAdministrator
Goal	To edit a pool in the system.
Preconditions	
Basic Flow	
Alternative Flow	
Postconditions	

Name	removePool
Actors	PoolShopAdministrator
Goal	To remove a pool from the system.
Preconditions	
Basic Flow	
Alternative Flow	
Postconditions	

3 Object Models

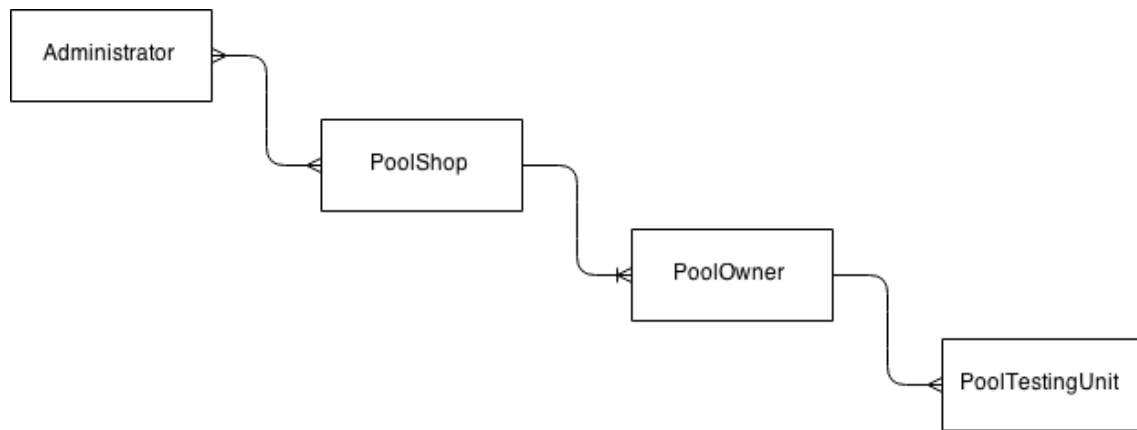


Figure 2: relationships between the main classes in the system

There can be multiple administrators in the SPACS system that manage all the PoolShops. Each PoolOwner can only be registered at one PoolShop, and each PoolTestingUnit can only be linked to one PoolOwner. The Administrator, PoolShop and PoolOwner objects all contain information about a single person.

4 Sequence Diagrams

5 Design Constraints

The following are a list of constraints that have been considered to make sure that the system is kept simple. This ensures

1. Relationships between objects are simple - Can't have one owner at two pool shops
2. A

6 Subsystems

1. Server
2. API
3. Database

7 State Charts

8 Design Pattern

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9 Dynamic Models

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