

# CST\_2550 Coursework1

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## Abstract

### **Describing work, results and conclusions:**

First coursework of Software Engineering Management and Development task was to design and create a gym database using SQL and interact with it in Java. Idea was to make staff job easier by doing their bookings in the system instead of paper book. Staff can add, delete, update, list bookings in the system easily just by entering information of a booking.

Result is not as I expected. Coursework appeared to be much harder and longer. I got stuck at connecting multiple clients to one server. I spent 2 days of trying to output functionality methods correctly to the client, which ended up successfully after attending appointment with Lecturer.

In conclusion I would say coursework was very challenging and it required more time and knowledge than I have. Yet every lab I was doing 80% of a lab exercises, I see that I need to increase that number to a 100% to be sure about future course works and exams.

## Introduction

### **Description of work:**

Database is successfully created, designed and normalised to a third normal form for the coursework scenario with ER diagram of it. SQL code is executed successfully as well with already inserted sample data. Server is implemented in a command line which connect to a database using Java. Server has methods which helps to achieve required functionality for the server itself. For that to be completed I used SQL queries that I developed for the database before. Server is displaying its capability of what it can return to user just not in a table. Client is getting a confirmation of success or failure message. If failure happened, he is getting informed why. Unfortunately, client side doesn't have Java classes implemented in it to be used by the client GUI and multiple client connection wasn't done as I got short on time and spent way too much time implementing other things and fixing errors.

### **Layout of the rest of the report:**

In following sections I talking about and presenting Database design, Software design and Testing in the project. All of these sections include: descriptions about it, ER diagram, normalization, UML diagrams, GUI wireframes, testing approaches used, records. In conclusion part I summarized my work and expressed my opinion about my current project design and implementation an

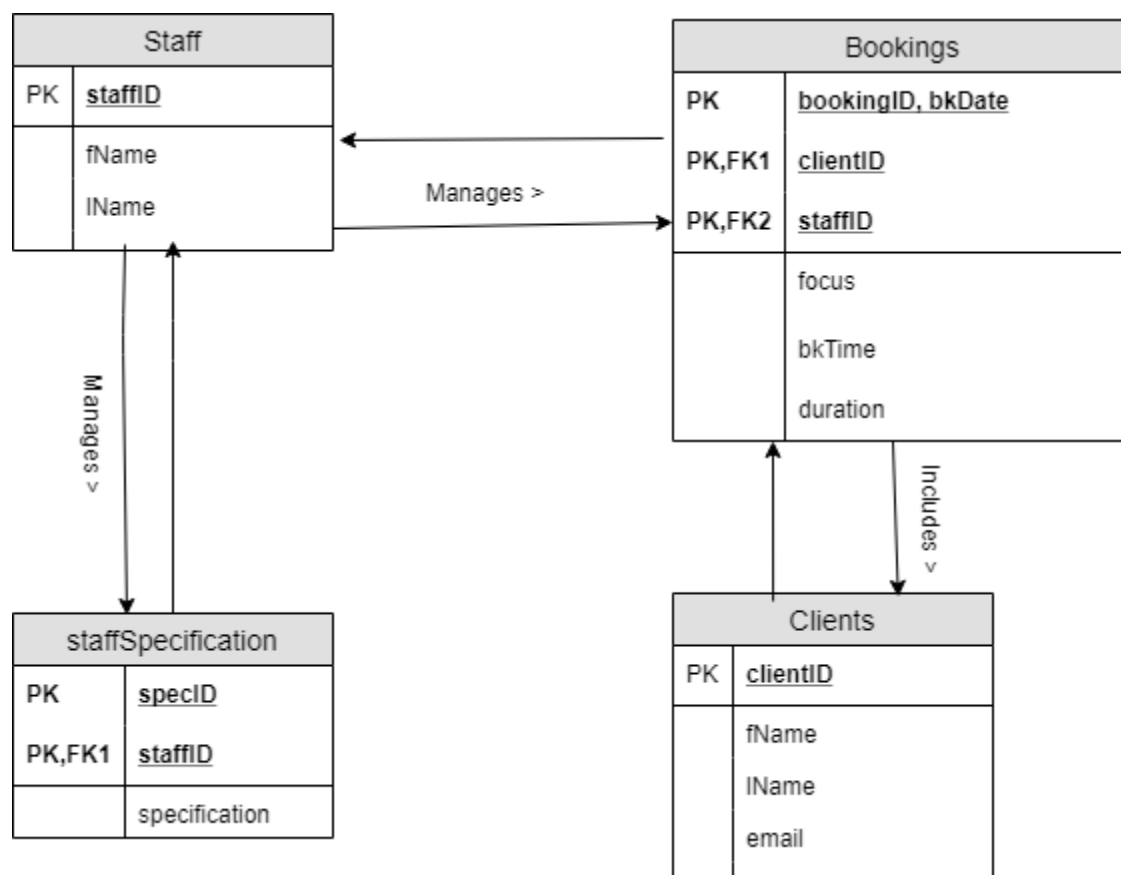
reflected my work. What I would do differently in future if similar project would appear to me is touched as well.

## Database design

### Description of designing a database:

I did not face a lot of issues with designing a database which would be in third normal form, I had only some minor ones. The main issue was to solve the problem with some of the personal trainers having multiple specialisations. As we know third normal form cannot have multiple values inside its column. So, here we go to **normalization**. My first created database was already in 2nd normal form, therefore it wasn't a lot of normalization. To make table Staff to a 3rd normal form I ended up with creating a new table called "staffSpecialisations" in which staff is assigned by specialisation unique id which solves the problem. ER diagram purpose is to graphically show systems entities and relationships between those entities.

### ER DIAGRAM:



### 3rd normal form database tables:

Bookings table

bookingID	staffID	clientID	focus	bkDate	bkTime	duration
1	2	1	Flexibility	2020-03-01	10:00:00	60
2	1	2	HealthMaintenance	2020-03-04	16:00:00	45
3	5	4	Strength	2020-02-14	15:00:00	90
4	3	5	WeightLoss	2020-02-18	09:00:00	60
5	4	3	Strength	2020-02-04	08:00:00	90

Clients table

clientID	fName	lName	email
1	Marc	Walker	marc123@gmail.com
2	Paul	Runner	runnerP@yahoo.com
3	Emanuel	Ecase	emanuel@gmail.com
4	Laura	Orac	laura19@gmail.com
5	Kacper	Tudor	KacTud@gmail.com

Staff table

staffID	fName	lName
1	Ali	Bee
2	Peter	Lopez
3	Maxim	Verstapen
4	Lukas	Petrov
5	Robert	Omar

staffSpecification table

specID	staffID	specification
1	1	HealthMaintenance
2	2	Flexibility
3	3	Strength
4	4	Strength
5	4	HealthMaintenance
6	5	WeightLoss

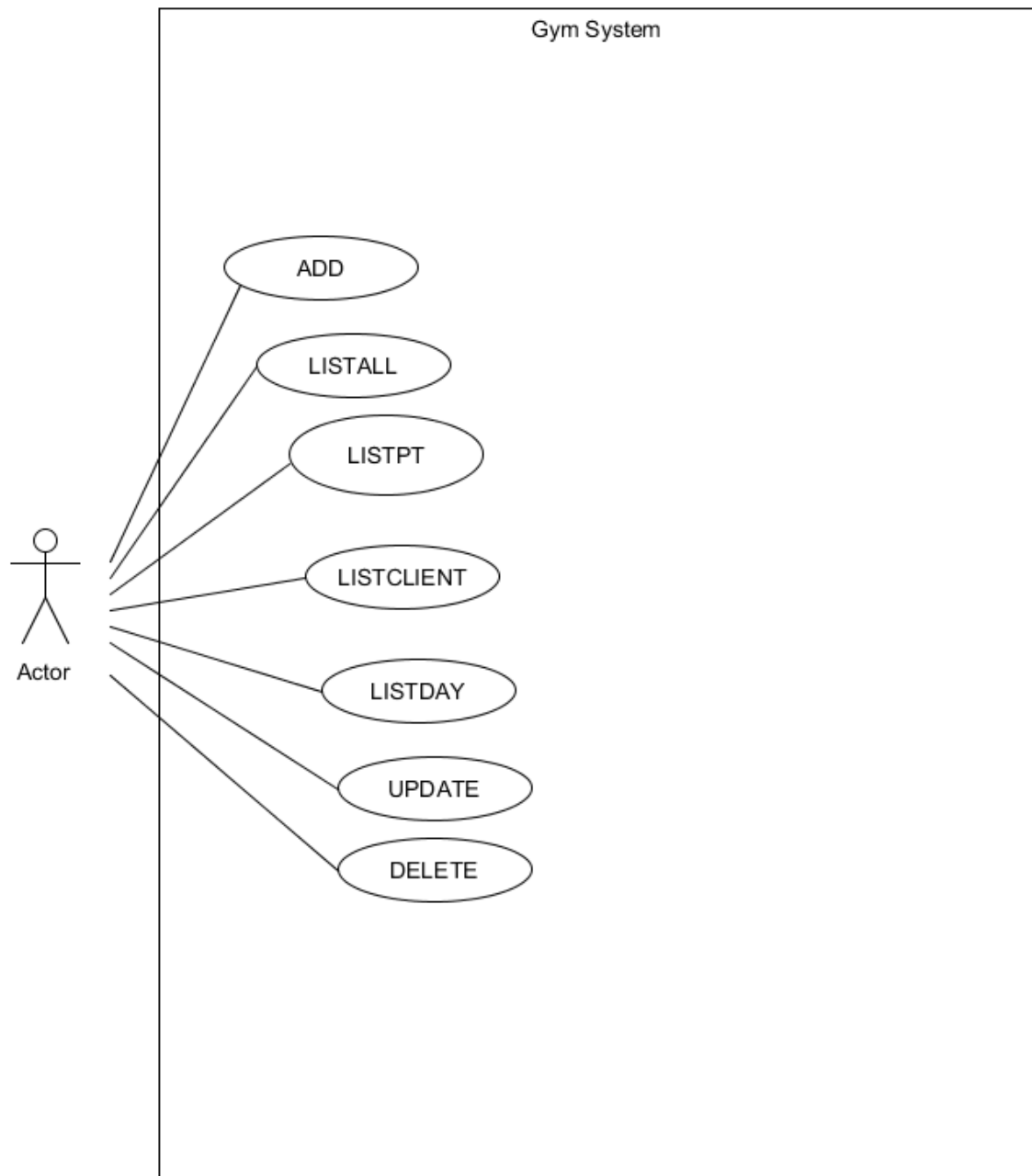
## Software design

### Description of software design:

Software design is a very important thing on projects like this. UML diagrams is diagrammatic representations of software components which helps a lot in understanding how software is going to work for a simple person (not engineer). There is more than 4 different types of UML diagrams, but we learned only about 4 of them: Use case, Activity, Class, Sequence. I have chosen to do Use Case diagram for this project just because I think it shows systems functionality and actors who interact with the system the best. Actors – they interact with the system. Relationships between actors and use cases are represented using straight arrows.

For this project GUI was also included as software design part. Unfortunately, I couldn't do the GUI part, but nevertheless I did wireframes of the GUI which I was about to use.

### USE CASE diagram:



**GUI Wireframes:**

## Choose what you want to do

List all bookings	<input type="button" value="SELECT"/>
List all bookings by choosen PT	<input type="button" value="SELECT"/>
List all bookings by choosen day	<input type="button" value="SELECT"/>
List all bookings by choosen client	<input type="button" value="SELECT"/>
Delete booking	<input type="button" value="SELECT"/>
Add bookings	<input type="button" value="SELECT"/>
Update booking	<input type="button" value="SELECT"/>

## Testing

### Describing testing and what approaches I used in this project to do that:

Testing is separated in types to be done to make things easier for everyone. For example, there is development testing, release and user testing. After all of them users are testing system and looking for any errors. All of these testing types are useful to be done for a any kind of project to make sure everything is working perfectly and there is no errors or mistakes done. Even though I did not spend a lot of time in the end by testing my project, I did some during doing it. For that I created a "Tests" table.

Table which displays issue faced, testing approach used, summary:

Issue faced/ Testing done	Approach and tools used	Summary
Server responding to a client	To check if client is successfully connected to a server, I had created an Echo system in server side and used Telnet to check whether server is responding with the same message as client did input.	Test was successful as the images show and after that I could work safely knowing that my server set up correctly.
Server-side functionality methods testing	For this testing I used Unit testing.	A lot of tests were unsuccessfully but when I got all my other errors out of the way, I managed to fixed all of them excluding <u>UpdateBooking</u> method.
Completed software	Release testing was done by one of my university friends.	He briefly checked the code and said that everything seems fine and software is ready to be released for a user testing
User testing	User testing by a user.	I asked my room mates to try use this system for a gym imagining that they are the staff of the gym. All of them did understood what and how has to be written inside client terminal, but they realised that update function is not working

## Conclusion

### Summary of work done:

I would say 50% of project requirements were done. By poor time management and too much self-confidence I didn't had time and knowledge to do multithreading which was allowing multiple clients connect to a server simultaneously and GUI was left on the side as well. System has some issues as update functionality is not working, but on the other side other functionalities I would say are working perfectly. Unfortunately, it doesn't have failure messages which could help user to fix his mistakes after bad input.

### Limitations of the current design/implementation and critical reflection of my work:

User cannot update bookings, system doesn't have any GUI implemented which doesn't affect the system itself but would look better to a user. Connection of multiple clients are not allowed as well which in some cases could be a problem when more than one PT's wants to use server and a line could queue.

### How I would approach a similar project in future:

First of all, would try to do things way earlier. Secondly, I would make myself a plan of tasks to do and a deadline for them. I think so that would help me to try stick in the schedule and don't let

myself to post pone tasks for later and I wouldn't need to worry about how much time do I have left. In additional I wouldn't spend so much time on minor errors which takes most of the project time and would carry on on something else and would book an appointment with SLA or lecturer to help with that.

## **References**