

Portfolio Project 2

This portfolio is about databases and graphical user interfaces. You can work on the portfolio in groups but be aware that the exam is individual, and you must be able to answer questions related to all parts of your portfolio. If you work in groups the members of the group must be named (with name and study number) on the first page, and only one of the group members need to submit on Moodle.

The submission should contain a pdf document for the six parts below and a zip file of source code. The overall submission of this part is limited to 5 pages plus the source code.

The maximum group size is 4.

The portfolio can be written in Danish or English.

Submission deadline for this part: April 3rd 2023 at 5PM via Moodle

Submission deadline for the full portfolio: May 4th at 10AM via eksamen.ruc.dk

The final submission of the full portfolio is limited to 48,000 characters, including spaces.

Groups should only submit one version via Moodle of this part. All students must submit the final version of the full portfolio via eksamen.ruc.dk on May 4th

Description

You are going to develop an application for booking shipment of containers from one port to another port. The application should use a graphical user interface and data be stored in a database. The user should be able to specify a departure port, an arrival port, a number of containers, a date and the system should then be able to find the next voyage of a vessel on this route with space for the shipment. The user should then be able to make a booking of the shipment. The system should only look for direct voyages without reloading cargo in another port.

The shipping department manages movement of vessels. A vessel has a name and a capacity. Each vessel can take part in a number of voyages. A voyage is a movement of a vessel from one port to another with a departure and arrival date. A voyage can contain several shipments. A shipment consists of a number of containers on a voyage for a customer.

Managing vessels and their planned voyages is not part of the system in this portfolio. The moodle page will contain a list of possible voyages that can be used for testing purposes. The aim of the system is to manage shipments on voyages.

The assignment consists of the following parts

1. Model the domain with an E/R diagram
2. Create tables and insert some sample data into the tables
3. Create a query to verify that no voyages have more shipment cargo than the capacity.
4. Create a query to verify that no vessels take part in overlapping voyages.
5. Create the system for booking shipments of containers.
6. Document runs of the program with screen shots

Part 1

The E/R diagram should contain cardinality of relations between entities. Cardinality can be specified using cows feet notation or with annotations of the form "1.. *". It should be clear which attributes are primary keys and foreign keys.

Part 2

Provide the commands to create table in the pdf document or in a file in a zip directory.

Part 3 and part 4

Create queries that return lists of voyages that fail the condition. If that list is empty, then all voyages satisfy the condition.

Part 5

Make a user interface in JavaFX (without using fxml) where a user can query for available vessels between ports.ⁱ Information about ports should not be hard coded in the program but extracted from the database. The user interface should contain combo boxes for selection of two ports and text fields to enter number of containers and departure date. A search button should then find a vessel with available capacity and report the name of the next available vessel. A booking button should add the shipment to the database. Usability and esthetics are not design conditions. Your solution may include code snippets from lectures. All dates in the system and user interface can be assumed to be integers of 6 digit numbers on the form <year-2 digit><month-2 digit><day-2 digit>. Dates can be compared using simple integer comparison.

Part 6

Document runs of the program with screen shots. Document that you can add shipments to the database using your system.

ⁱ As inspiration you may look at a real world website for finding vessels for shipment:
<https://www.maersk.com/schedules/pointToPoint>