Nordic Motorhomes Project

Problem description

Nordic Motorhomes rental is a Danish company that rents out motorhomes. Nordic motorhome rental was founded in 2016 and is situated just outside Copenhagen. So far there are 8 employees but the company is very successful and the two owners expect to hire more people in the near future.

Employees: 4 Sales assistants, 2 Cleaning staff, 1 Auto mechanic, 1 bookkeeper

The Fleet

Nordic motor home rental has a fleet of 32 motorhomes available for hire. Nordic motor home rental currently offer 8 different types of motorhomes. These are of various brands and models. Some are small compact campers for 2 persons and others are large with up to 6 beds.

Prices per day

The price per day for rent depends on the brand and model of the motorhome.
Apart from the brand and model price per day also depends upon the season. There are 3 seasons: Peak season, Middle Season and Low season.

In peak season the prices for all motorhomes are 60 % higher than prices in the middle season. In middle season the prices for all motorhomes are 30 % higher than prices in the low season.

- · The price per day includes 400 free kilometers per day.
- · Insurance is included in the price.
- · External cleaning is included in the price.

Pick-up and drop-off points

Nordic motorhome rental offer delivery of motorhomes to a location that is most convenient for the customers. It is often an airport but it can be any other location for instance a ferry port or a hotel. For pick-up or drop-off outside Nordic motorhome rentals office. Customers will be charged a transfer cost of 0,70€ per kilometer.

Extras

To make the trip more enjoyable customers can rent accessories such as bike rack, bed linen, child seat, picnic table and chairs etc.

Fuel & driven kilometers

When customer picks-up the motorhome the tank is full. By drop-off the staff checks the fuel level and the reads kilometers of the speedometer. If the tank it is less than ½ full there will be a charge of 70€. If it turns out that the customer on average has driven more than 400 kilometers per day. Then the customer will be charged 1€ per extra kilometer.

Cancellation

In case of cancellation following charges become due:

· Up to 50 days prior to the start of the term of rental: 20% of the rental price, minimum 200€
· Between 49 and 15 days prior to the start of the term of rental: 50% of the rental price
· Less than 15 days prior to the start of the term of rental: 80% of the rental price
·   On the day of renting: 95% of the rental price

Service and repairs

After drop-off the Motorhome will be cleaned. The auto mechanic checks oil & water etc. If repairs or further service is needed the auto mechanic register this.

Your task

You are hired to develop a new system for Nordic Motorhome rental that can handle information about motorhomes, rentals and customers. For this first version of the system the owners and the staff at Nordic motorhome rental will be the users of the system. In a future version of the system the customers should be able to make reservations through a web interface. Your task is to develop the first version of the system.

The owners of *Nordic Motorhome rental* expect that the system will be able to:

· Display a list of Motorhomes showing if they are available, rented out or out of service
· Register a reservation of a motorhome
· Calculate the price for a rental
· Register a rental of an Motorhome and print a contract for the customer to sign
· Register payment for rental
· Register pick-up and drop-off of motorhomes
· Calculate the price for a rental
· Register service and repair of motorhomes
· Add new motorhomes and update info about existing motorhomes

Alternative Project

Instead of the Nordic Motorhome project. You are allowed to define your own project in cooperation with a company. Your teachers must approve the project definition!

Requirements to ITO

The report must contain the following subjects:

- A description of the organization including:
    - A description of the company
    - Organizational structure
    - SWOT-analysis
    - Stakeholder-analysis
    - Feasibility study

Requirements to software design

System development must be based on Craig Larman "Applying UML and Patterns". The methods of the Unified Process, UP, should be followed. The disciplines involved are: Requirements, Business Modeling and Design (see front cover of the book) and a simple Phase Plan.

Create these artifacts:

- A Supplementary Specification (List of Non-functional requirements).

- Show a Use Case Diagram with at least 6 use cases, of which 3 are described fully dressed with extensions. Choose 2 of these fully dressed use cases as the basis for further diagrams.

- Identify system events and record them by drawing 2 System Sequence Diagrams, 1 of which is further refined to a Sequence Diagram.

- Identify conceptual classes by drawing a Domain Model.

- Create a Design Class Diagram (DCD) based on your Domain Model and Sequence Diagrams. The DCD is a first shot and need not be complete. Your observations about the process of making the DCD are welcome.

- Mention at least 3 GRASP responsibilities, where they are used or could have been used in your project.

Make a simple Phase Plan before you start, describing expected activities. Use UP terminology of Inception-Elaboration-Construction and attempt to identify iterations.

Requirements SWC 2

Your reservation system must have a GUI interface and the underlying application must connect to a database. The functionality of your application must reflect the use cases that you have worked on in your design phase and the features that are listed in the problem description. You should use a theme look (CSS) in your GUI. The design of both your code and your database should be reflected in your source code.

Your code should reflect an understanding of object oriented coding and your database should consist of at least 3 tables.
In order to meet the requirements for the SWC class your project report must contain the following:

- A class diagram, including states/fields and methods.
- A diagram of your database tables.
- The scope of the SWC part of the project
- A thorough description of the construction of the application and a substantiated explanation of the choices you have made.
- A careful description of what is working in the application, and what is not, and why.
- A thorough description of a selected snipped of code.
- A thorough manual for your application/GUI.
- Correlation between software Design and software construction must be evident.

Requirements TECH 1

Your system will use a database that is on a remote server (AWS or any other server).

For security reasons your application will have a login system. Furthermore you need to make sure your application is protected against well known attacks types.

In your report you will describe your security plan.

Requirements to report and programme documentation

You are expected to prepare a project report which documents the system's development and implementation.The audience of the report is the teachers.

IMPORTANT: In the report and source code should it be clear who in the project group is responsible for which chapter, sections and classes

The project report, which constitutes the written part of the exam, must as a minimum contain the following:
- Front page, including title, name and date of birth, class and date
- Table of contents
- Problem statement or question
- Main section
- Conclusion
- Bibliography (including all sources referenced in the project)
- Appendix (only appendices central to the report are to be included)
- Enclose source code and, if relevant, specify the path to the version control server where the source code and executable product code can be retrieved

Number of Students	Minimum pages	Maximum pages
1	30	40
2	35	50
3	40	55
4	45	60

Front page, table of contents, bibliography and appendices are not included in the required number of pages. Appendices will not be assessed.

A standard page is 2,400 characters, including spaces and footnotes.
Each figure or diagram is equivalent to 800 characters.

Project implementation process and guidance

The report must be submitted electronically to WiseFlow by May 31 no later than 12:00 p.m.

Students work in project groups. There should be a group contract.

Teachers offer guidance during the specified project period. The guidance takes place in relation to the present timetable.

The teachers do not read the report or parts of the report before submission.