

Module Code: CSE454

Module Title: System analysis and Design

Semester: Fall 2022/2023

Group Project (15 Marks)

Problem Definition

Consider the following Description for Car Rental Business System (CRB)

Vehicles can be taken from one location and returned from the same location or a different location with an additional charge. Although the company is, at present, concerned only with passenger cars, it may branch out into other forms of vehicle rental in the future and would like to be able to use the same reservation system. The company has several different makes of car in its rental fleet, from different manufacturers. Each make may have several models, for example, Toyota has Corolla, Camry, etc. the models are grouped into a small number of price classes. The customer must be able to select the make and the model he/she wants to rent. If the selected car is not available, the system must display a message telling the customer that the car is rented out and let the customer select another make and model or have the system to suggest similar models of different make. The company has a number of different rental plans available to customers. For example, there are "a daily unlimited miles plan" and "weekend savings plan". The company finds it important to have information available on the models of car, automatic or manual transmissions, tow or four doors, and sedan or hatchback. The rental price may be different for different options and a customer will want to know such information when reserving a car. Currently, customers make reservations directly with the car rental company either in person or by phone. The salespersons process the reservations manually using a reservation form and archive them in the file cabinet. No deposit is required at the time of reservation. The reservation is avoided, if the customer does not show up to sign the contract for more than a given period of time. Such reservation is honored only if there are still cars available to satisfy request. Sometimes a customer wishes to make a block reservation for several cars and to have the invoices for all rentals on the reservations handled together. As soon as a car is checked out to a customer, an invoice is opened. A single invoice may cover one or more rentals. Normally, a customer will pay the invoice when the car is returned but, in some cases, the invoice may be sent to a company (such as the customer's employer). When the customer pays by a credit card, the rental charge will be proceeded through a credit card processing company. A car may or may not be available for rental on a given day. Rental cars need frequent preventive maintenance and, in addition, any damage to car has to be repaired as soon as possible. The company wants to keep track of the rental car purchase, repair, maintenance, and disposal information for business and tax purposes (for example, depreciation of the rental car).

After the student reading this description, he should implement the following points

- 1- Write, design, and draw potential Use-cases and scenarios for this system
- 2- Make a comprehensive analysis for each use case.
- 3- Determine entity , boundary, control objects via analyzing phrases for each flow of events of Use - Case.
- 4- Design CRC cards for each object and determine each responsibilities and coordination with other objects.
- 5- Design and draw the suitable and equivalent sequence diagrams for this system.

6- Design and draw the most optimal class diagram for this system.

General Instructions

- 1- Each group consists from 3-4 Students.
- 2- The student can use any program or software tool to produce and design different diagrams for this CRB system.
- 3- Hard copy report for each students group should be with you during discussion and it should contain the following information:
 - Report cover containing title and student name and each student responsibility during implementing this project.
 - All potential requirement elicitation and analysis
 - All potential Use-Cases diagrams and potential scenarios.
 - All potential CRC cards.
 - All potential Sequence diagrams.
 - Optimal design of Class diagram.

Submission Datelines.

The complete project should be delivered via El-Learning System before 22/12/2022 on 11:00 PM. Any project after this date and time will not be considered.

Assessment

Demonstration & discussion during week 14 at Sunday 25/12/2022 on 9:30 – 12:00 AM (room D116)

Grading Policy

- Failing to implement the system correctly and producing the correct output, it will result in 80% reduction of your overall grade.
- If you do not follow the report instructions specified above, it will result in 20% reduction (for each point) of your overall grade.
- Failing to answer the questions in the project discussion, it will result in 50% reduction of your overall grade.

I HOPE ALL THE BEST FOR YOU AND GOOD LUCK