ROCHESTER INSTITUTE OF TECHNOLOGY
Department of Software Engineering
SWEN610 – Foundations of Software Engineering – Section 01
Midterm Exam, (Take-Home Exam) – Individual Assignment

eCar-Kiosk: Business Requirements Specifications

You have been selected to develop ***eCar-Kiosk*** application. In this phase, you are required to model the static view of the intended system services. The following are some of the required functionalities.

***eCar-Kiosk* Functional Requirements**

- The *eCar-Kiosk* application is to be used only by the following users: a manager, a clerk and a customer.
- The *eCar-Kiosk* system shall allow users to create personal accounts and thus access the system via one of the following mechanisms: a combination of a user name and a password, or a fingerprint capture.
- The *eCar-Kiosk* system must allow a user to select only one car for rent from a set of three car categories, Small-size, Medium-size, and Full-size from a catalogue of five car models. Each car model in each category is depicted by a graphical image.
- The system should retrieve from the regional control computer all the information including category, carmaker, model, license number, mileage, and color of all the rental cars allocated to its location (in this version of the system three locations are considered).
- Each rental car at any time is in one of the following status: ready, rented, overdue, or in repair. A car can be rented only if it is ready status. (*Overdue fees shall not be considered in this design phase*).
- The user can only pay using one of the following Credit Cards: Visa, MasterCard or American Express.
- Credit card information must be approved from the regional control computer of the corresponding chain; otherwise the transaction is canceled and terminated.
- The system shall allow users to cancel car reservation, given that a 24-hour notice is received. Otherwise a cancellation fee (20% of the rental cost) will be deducted from the customer credit card. Only the manager can waive a particular cancellation fee.
- When a car is rented to a customer, the contract number, renting date, returning date and the rental rate (total) should be recorded and communicated to the regional product control computer as well as be printed in a form of a rental agreement.
- The system shall allow a manager to generate a general report about the rented cars on monthly/ quarterly and annually basis.

1. DUTIES

a) [4 points] create a set of at least **Six** stories user stories to capture some of the aforementioned functionalities. Consider grouping user stories into epics as appropriate.

b) [10 points] Develop the static view (UML Class Diagram). Object oriented methodologies shall be used to develop the design of the ***eCar-Kiosk*** (UML *2.X* shall be used as the modeling language).

   a. Relationships and multiplicities need to be clearly illustrated.

   b. Methods and attributes need to be defined in their relevant classes. No details are required.

c) [6 points] Based on the Class diagram developed in (a), draw UML sequence diagrams depicting the sequence of events that fulfill the following functional requirements: Use *frames* to depict alternative flows.

   a. A user to print a rental agreement.

   b. A manger to generate a monthly and Annually report.

d) [5 points] Draw the corresponding StateChart diagram that captures the possible states for a specific rental car. All states (including initial and final), events, transitions, actions and applicable guard conditions need to be clearly depicted.

2. SUBMISSION (Online → myCourses/Assignments/Midterm Exam)

a) Submit a **PDF file** containing all your developed UML diagrams (clear and readable format) in myCourses (**NOT LATER THAN 2:00 pm, Wednesday October 7, 2020**) as per the following naming convention:

***YourName*-SWEN610-F20-Exam-eCar-Kiosk-10092020**

b) It is recommended that you first create the diagrams on paper, then when satisfied, transfer it online using your preferred UML modeling tool. Once completed, insert the diagram into this document and resize it to be legible.

c) Every step towards reaching a solution must be evident, and assumptions made (if any) must be explicitly stated in order to receive full credit.

d) ANSWER ALL QUESTIONS - all work MUST be contained in this document.

e) You may submit as many times as you like; only the most recent version of each files will be graded.

f) Late submissions **will not be considered**

**** Good Luck ****