Department of Electrical and Computer Engineering
Principles of Software Design

ENSF 614 – Fall 2022
Term Project

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Total Mark: 100

Introduction:

In this assignment you are supposed to practice a complete process of design and development of a software project, using a systematic design methodology.

As I mentioned before the last part of the course is focused on system level design and architecture and will be achieved in an “Active Learning” pedagogic approach. It means while theoretical concepts will be discussed in lectures, the corresponding practical techniques to build some design components will be developed in the classroom. This method shows you the initial directions and helps you to have a better vision on how to continue the details later

When you are working as a member of group you should assume a full responsibility and your commitments must be achieved at your best capacity. All group members should be available during the lectures and labs, to participate in class/group discussions, and to achieve their own portion of work.

A Movie Theater Ticket Reservation App

In this project your task is to analyze, design, and develop a system that can be used by two group of users: ordinary users that can search for a movie, select an specific theater, view available show times, view graphically available seats, select the desired seat, make payment by credit card, receive a copy of ticket and the receipt, via email. Users also should be able to cancel their ticket only up to 72 hours prior to show and receive a credit with %15 administration fee for future purchase up maximum of one-year expiration date. The other group of users are those who must be registered (let’s call them Registered Users, RUs), and their information such as name, address, credit and/or debit card account must be saved on the system’s database. RUs must pay a $20.00 annual account fee, but they don't have to pay 15% admin fee for cancelling their tickets and will receive the movie news before public announcement. There is also one more constraint: Only 10% of the seats can be purchased by RUs on a first come first serve policy prior to public announcements.

Your Design document must include all the required details of the full version of the desired system, but your implementation responsibility will be limited to a single theater development. I will discuss further detail in one of the upcoming lectures.

Deliverables:

Design Phase (50 marks)

In this phase you should submit a Design Document that includes a clear description of system's requirements, and design artefacts as follows:

- Systems use case diagram.
- Systems activity diagram
- A detailed "Scenario" for each use case, **having all candidate objects underlined**, and all candidate operations underlined (use single-underline for objects and double-underline for operations).
- A state transition diagrams for the following objects:
    - Ticket object
    - Payment object
    - And two uses cases in your system

  Note: Each member must take responsibility for one and his/her name must appear on the related page
- System interaction diagrams for at least four major and important use cases in this system (each team member must take responsibility for one and his/her name must appear on the related page).
- A Design Level Class Specification that includes:
    - A class diagram without attributes and behavior that only shows the class name and the relationships among them. The purpose of this diagram is to show the entire system in one page. Please make sure lines never cross each other and the diagram is clear and easy to read.

      Note:
        - You class diagram should be traceable in your use-case scenarios. Mark will be deducted for class that are not traceable in the use-case diagram.
        - In your class diagram you don't need to show Java library classes such as Exceptions, Buttons, String, ArrayList, etc.
        - Make sure clearly identify the stereotypes of your classes (such as <<entity>>, <<eontrol>>, <<boundary>>
        - Make sure the multiplicity/cardinality is properly indicated.
    - A class diagram with no relationships, only showing the class details: attributes and behaviours. This diagram can be organized in multiple pages. Please try to keep them well organized, clear, and easy to read.

      Note: You don't need to show constructor/destructor, getters/setters
- A Package Diagram
- A Deployment Diagram

Note: In this stage you need to apply all possible design strategies and techniques to make the architecture of the system more: reusable, scalable, maintainable, reliable, and using necessary concepts such as modular design, inheritance, realization, aggregation, composition, polymorphism, and appropriate design patterns as needed.

Due Date for Design Document: Thursday Nov 24, 2022, before 11:59 PM.

Part II (50 marks)- Implementation Stage

In this phase will implement your proposed design, in Java. The details of implementation will be discussed later.

What to submit on the D2L?

A **zip** file that contains:

1. A **jar** file that contains all `.class` files.
2. A tar file that contains all `.java` files.

Due Date for implementation is Thursday December 1, 2022, before midnight (11:59 PM). You need to demonstrate your working application on Tuesday Dec 6.