
Term Project – Phase 2

INTRODUCTION

- In this project you will collect the requirements, design, and implement a non-trivial software system. You will practice the concepts you learned during the course.

PROJECT DETAILS

Apply the Object-Oriented concepts that you've learned (Abstraction, polymorphism, interfaces, packaging, ...) utilizing **Boundary, control and entity** concepts as well as **SOLID Principles** to design a **Parking Garage application** and implement it using an object-oriented programming language. This application manages a parking space for a configurable maximum number of vehicles. Each parking space (slot) defined with a dimension (width and depth) The designed application must handle the following functions:

- Each vehicle shall be identified by a model name, unique identification number, Model year and vehicle dimensions (vehicle width and depth).
- Park-in function that marks the arrival time of a vehicle if there is an available slot. The application shall capture such time automatically from the system.
- During the park-in function the application shall pick a free slot based on the active slot configuration. There are two configurations (i) first come first served slots i.e., the park-in function will use the first free slot available from the parking garage slots. (ii) best-fit approach where you need to find the slot with the minimum dimension to hold the vehicle.
- Park-out function that marks the departure time of a vehicle from the garage. The application shall capture such time automatically from the system.
- Calculate the parking fees during the park-out based on the time-of-stay with an hourly rate of 5 EGP.
- Calculate the total income as well as the total number of vehicles that used the parking garage at any given point in time.
- Display the available parking slots
- Enrich your application with the capability to handle a set of exceptions that can happen during user interaction and through any other calculations. The displayed error message for exceptional behavior should be descriptive.

PHASE 2 DELIVERABLES

- A software requirements specification document. You must use the attached template that is published on blackboard “CS251-SoftwareRequirementsSpecifications-SRS-Template-v2.0”
- A software design specification document. You must use the attached template that is published on blackboard “CS251-SoftwareDesignSpecifications-SDS-Template-v2.0”
- **The source for the Implementation of All features explained in the Project details section.**
- A word document includes answering the following question after inspecting your final class diagram to answer the following questions:
 - Does your class diagram respect or violate SOLID principles? Justify your answer.
 - Does your class diagram contain any design pattern(s), if yes name it and list the names of the classes involved in such pattern(s).

GRADING CRITERIA

- The correctness of the features.
- The correctness of your application’s design as per the explained object-oriented concepts from a software engineering perspective.
- Design compliance with Boundary-Control-Entity concepts.
- Design compliance with SOLID principles.
- The consistency between the use case model, the sequence diagram, and the class diagram
- Applying Java code style and comments.

General Guidelines

- The consistency between the software design and the source code.
- Applying standard code style and comments is essential.
- ***You should use the object-oriented concepts that you learned, in both the lectures and the labs, as needed.***

Delivery Notes

- **The project Phase 2 submission is due on Tuesday 31 May 11:59 pm**
- Submission needs to be done through the course’s Blackboard only.

- This is a group project of 4 members (at most). If you submit as a group of more than four members, ALL the group members will get 0.
- ALL students should work and fully understand everything in the submitted solution.
- No late submission is allowed.
- Submission will be on blackboard. It is your duty to ensure that your submission was properly uploaded to blackboard after you finish submitting it. If your submission was not uploaded properly while marking, you will not receive a grade for the assignment.
- No submission through e-mails.
- You need to create ONE folder, that put **all the required documents and source code** in that folder. Each MS Word file must include the names and IDs of all team members. All documents need to be submitted as **MS Word** files. You will put those two files **(the Word file and the source code file)** in a folder named CS251_ProjectPhase2_GroupNumber_firstStudID_SecondStudID_ThirdStudID_FouthStudID and compress them to a .zip file with the same folder name. The compressed file would be the file to be delivered.
- **Failing to abide by the naming conventions of the file or failing to submit the files as per the requested extension, would result in a ZERO for both team members.**
- **In case of cheating, you will get a negative grade whether you give your solution to someone, take the solution from someone/internet, or even send it to someone for any reason.**