Cairo University  
Faculty of Computers and Artificial Intelligent

**CS251 - Software Engineering I**

Parking Garage application

Software Requirements Specifications (SRS)

Great mates

May & 2022

Contents

[Team 3](#_Toc101814800)

[Document Purpose and Audience 3](#_Toc101814801)

[Introduction 3](#_Toc101814802)

[Software Purpose 3](#_Toc101814803)

[Software Scope 3](#_Toc101814804)

[Definitions, acronyms, and abbreviations 3](#_Toc101814805)

[Requirements 4](#_Toc101814806)

[Functional Requirements 4](#_Toc101814807)

[Non Functional Requirements 4](#_Toc101814808)

[System Models 4](#_Toc101814809)

[Use Case Model 4](#_Toc101814810)

[Use Case Tables 5](#_Toc101814811)

[Ownership Report 6](#_Toc101814812)

[Policy Regarding Plagiarism: 6](#_Toc101814813)

# Team

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Name** | **Email** | **Mobile** |
| 20200251 | Shrouk Ayman Ali | Shrookayman617@gmail.com | 01152034147 |
| 20200107 | Aya Mohamed Mounir | Aya.mounir167@gmail.com | 01102268167 |
| 20200072 | Aser Mohamed | asermohamed652001@gmail.com | 01005802648 |
| 20200423 | Mohamed Ahmed Abdelghany |  |  |

# Document Purpose:

* **This document is a software system for the Parking Garage application**
* **Owner of the garage is expected to read it.**
* **Stakeholders by specifying the needed functionalities of the software to minimize development time and cost by making the requirements clear.**

**Audience:**

• Software Development team.

• Stakeholders: Garage Owners.

# Introduction

## Software Purpose

* **It parks different types of vehicles and facilitates the way to park.**
* **Parking software is used by companies to optimal parking space, Manage the influx of cars and ensure the**
* **safety of both cars and people, The system provides details of free parking slots in the parking space and**
* **reduces traffic Issues, Mange multiplies types of fees and process payments, The system can apply to many types of Garage like public, private or companies Garage.**

## Software Scope

* **System provided the credit card payment.**
* **System provided scanning tickets.**
* **The parking system implements defining the best area for any vehicle, Garage Owner manages how its garage work to optimal performance.**

## Definitions, acronyms, and abbreviations

* **First come first in approach: this function chooses the first free slot that the user will park in regardless dimensions of the vehicle.**
* **Best fit approach: this function chooses the best slot that will fit the vehicle according to the dimensions of the vehicle regardless of the distance between distance and slot.**

# Requirements

## Functional Requirements

* Each vehicle needs to get into the system (Garage) and should have a model name, unique identification number, model year, and vehicle dimensions and the driver should enter it.
* Park-in function should mark the time that vehicle arrives and check if there is an available slot and capture such time automatically from the system.
* Park-in function should choose a free slot based on the active slot configuration by two configurations:
  + the park-in function will use the first free slot available from the parking garage slots.
  + A best-fit approach where you need to find the slot with the minimum dimension to hold the vehicle.
* Park-Out function should record the departure time of a vehicle from the garage and capture such time automatically from the system.
* The parking fees are based on time-of-stay with 5EGP for an hour.
* The user can pay with cash or with credit card services.
* The system should calculate the total income and the total number of vehicles that are parking at any given point in time.
* The system should display an error message for exceptional behavior should be descriptive.

## Non-Functional Requirements

|  |  |
| --- | --- |
|  | **Details** |
| **Performance** | * System supports different sizes for different types of vehicles. * The system should be Performance that the vehicle can park in easily and open quickly by checking the slot availability and finding the suitable slot. * Response of acknowledgment should be 4 seconds. * if the user entered the wrong input the system should ask him to enter it again. |
| **usability** | * The system should be Usability that can be easy and friendly to the user   By clicking 3 times to book a slot successfully. |
| **supportability** | * Garage system supports the hourly payment of fees, customer pays 5 EGP per hour. |
| **Availability** | * The System is available for 24 hours. |
| **Security** | * Garage is very safe, equipped with surveillance cameras. * The system should be enriched with a Security well to protect the identification numbers for cars. |
| **Reliability** | * the system crash shouldn’t result in data loss. |

# 

# System Models

## Diagram Description automatically generatedUse Case Model

## 

## Use Case Tables

|  |  |  |
| --- | --- | --- |
| Use Case ID: | UC 1 | |
| Use Case Name: | Park-in first come first served slots approach | |
| Actors: | customer | |
| Pre-conditions: | The system appeared on a screen that there is a suitable slot for his vehicle’s size and then take a ticket. | |
| Post-conditions: | The customer entered the garage and parked his/her vehicle. | |
| The flow of events: | **User Action** | **System Action** |
| 1- customer wants to log in then he/she fills in some information: model name, unique identification number, model year, and vehicle dimensions. |  |
|  | 2- System verifies from vehicle’s information.  3-system finds a slot suitable for the vehicle’s dimensions. |
| 4- customer wants to take a ticket. |  |
|  | 5- The system takes out the ticket. |
| 6-customer goes to park in his slot. |  |
| Exceptions: | **User Action** | **System Action** |
| 1- customer wants to log in. |  |
|  | 2- The system verifies the vehicle’s information.  3-system does not find a suitable slot. |
| Includes: | Choose approach – enter vehicle info – calculate park in time | |
| Notes and Issues: | park-in will use the first free slot available from the parking garage slots. | |

|  |  |  |
| --- | --- | --- |
| Use Case ID: | UC 2 | |
| Use Case Name: | Parking fees | |
| Actors: | Customer - system | |
| Pre-conditions: | The system appeared on a screen with the total cost of the vehicle. | |
| Post-conditions: | The customer pays the required cost. | |
| The flow of events: | **User Action** | **System Action** |
| 1. customer wants to park out 2. customer inserts the ticket into the instant ticket machine. |  |
|  | 3- The system scans the ticket to check the entry time and the time that the customer wants to go out and calculate the duration.  4-system calculates the cost to pay 5 EGP per hour.  5-system displays on the screen the total fee and asks the user to pay the required cost. |
| 6- customer pays the total cost. |  |
|  | 7- The system receives cash and checks it out.  8-system opens the garage gate |
| 9-customer leaves the garage. |  |
| Exceptions: | **User Action** | **System Action** |
| 1- customer wants to park out.  2-customer inserts the ticket in the instant ticket machine. |  |
|  | 3- the system goes down. |
| Includes: | Calculate duration | |
| Notes and Issues: | parking fees during the park-out based on the time of stay with an hourly rate of 5 EGP. | |

|  |  |  |
| --- | --- | --- |
| Use Case ID: | UC 3 | |
| Use Case Name: | Park-in best-fit approach | |
| Actors: | customer | |
| Pre-conditions: | The system appeared on a screen that there is an available slot, but its dimensions are bigger than the vehicle’s dimensions. | |
| Post-conditions: | The customer entered the garage and parked his/her vehicle. | |
| The flow of events: | **User Action** | **System Action** |
| 1- customer wants to log in then he/she fills in some information: model name, unique identification number, model year, and vehicle dimensions. |  |
|  | 2- System verifies from vehicle’s information.  3-system finds that there is an available slot, but its dimensions are bigger than the vehicle’s dimensions. |
| 4- customer wants to take a ticket. |  |
|  | 5- The system takes out the ticket. |
| 6-customer goes to park in his slot. |  |
| Exceptions: | **User Action** | **System Action** |
| 1- customer wants to log in. |  |
|  | 2- The system verifies the vehicle’s information.  3-system system is an available slot, but its dimensions are smaller than the vehicle’s dimensions. |
| Includes: | Choose approach – enter vehicle info – calculate park in time | |
| Notes and Issues: | find the slot with the minimum dimension to hold the vehicle. | |

|  |  |  |
| --- | --- | --- |
| Use Case ID: | UC 4 | |
| Use Case Name: | Park out | |
| Actors: | Customer | |
| Pre-conditions: | The customer wants to get out of the parking area. | |
| Post-conditions: | The customer checks out from the parking area. | |
| The flow of events: | **User Action** | **System Action** |
| 1- the customer request to log out. |  |
|  | 2- the system calculates the parking duration.  3- total fees appear on the screen. |
| 3-the customer pays the total cost of the parking. |  |
|  | The 4-the system displays a menu of the payment way. |
| 5-the customer chooses credit card payment. |  |
|  | 6-the system confirms the payment |
| 7-the customer leaves the garage. |  |
| Exceptions: | **User Action** | **System Action** |
| 1- the customer request to log out. |  |
|  | 2- system crashed. |
| Includes: | Parkin – calculate park out time. | |
| Notes and Issues: | marks the departure time of a vehicle from the garage. | |

|  |  |  |
| --- | --- | --- |
| Use Case ID: | UC 5 | |
| Use Case Name: | Total income | |
| Actors: | admin | |
| Pre-conditions: | admin wants to calculate total income | |
| Post-conditions: | Admin gets the number of the total income. | |
| The flow of events: | **User Action** | **System Action** |
| 1- admin wants to know how many vehicles are in the garage |  |
|  | 2-display number of vehicles |
| 3- admin wants to know how the time spent by each vehicle. |  |
|  | 4-calculate total income by multiplying total hours of vehicles by 5. |
| Exceptions: | **User Action** | **System Action** |
| 1- admin wants to know how many vehicles are in the garage. |  |
|  | 2- system crashed. |
| Includes: | Calculate the number of vehicles | |
| Notes and Issues: | Calculate the total number of vehicles that used the parking garage at any given point in time. | |

# Ownership Report

|  |  |
| --- | --- |
| **Item** | **Owners** |
| Use case tables | *Aya – Shrouk – Aser -Mohamed* |
| requirements | *Shrouk - Mohamed* |
| Use case diagram | *Aya* |