Cairo University  
Faculty of Computers and Artificial Intelligent

**CS251 - Software Engineering I**

Project Name

Software Requirements Specifications (SRS)

Team Names

Month & Year

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# Team

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# Document Purpose and Audience

# This document includes Requirements Specifications for parking Garage application. who will read it project manager and garage owner.

**In order to understand the requirements of the software before it’s implemented**.

# Introduction

## Software Purpose

## The system provides details of the vacant parking slots, in the vicinity and reduces the traffic issues, due to illegal parking in the vicinity. It is designed with an objective to meet the requirements of controlled parking, that offers effortless parking tactics to the authorities.

## Software Scope

• vehicle drivers need to substitute queue for getting service.

• Using this application garage owner enter the number of slots in garage and their width and length.

• when vehicle driver arrives at enter gate, garage owner enters vehicle's information, search for empty slot then choose one of two configurations to park in.

•system captures photo for vehicle and save arrival time.

• when vehicle driver wants to leave, system captures photo for vehicle and save leaving time.

•Calculate the parking fees based on the time-of-stay with an hourly rate of 5 EGP.

•cancel reservation of slot where vehicle was parked in.

• garage owner can display available slots and calculate the total income at any time.

## Definitions, acronyms, and abbreviations

best-fit approach: where you need to find the slot with the minimum dimension to hold the vehicle.

# Requirements

## Functional Requirements

* **Garage system allows cars to enter when certain information is provided.**
* **­Garage owner requests the entering car: Model name, model year, unique identification number and the dimensions of the vehicle.**
* **Garage owner checks for available slots before allowing the vehicle to enter.**
* **Garage owner reserves suitable slot for the vehicle if there are free available slot.**
* **Garage system automatically captures the time in which the vehicle enters.**
* **Garage system automatically captures the time in which the vehicle leaves.**
* **Garage system calculates parking fees based on an hourly rate of 5 EGP/h  
  based on the time which the vehicle stayed in the garage.**
* **Garage system calculates the total income as well as the total number of vehicles that used the parking garage at any given point in time for the garage owner to display and review.**
* **Garage owner can display available parking slots and their dimensions at any time.**
* **The system can handle different exceptional scenarios.**

## Non-Functional Requirements

* **The system should response to the user within a time frame of 1 second.**
* **The system should prevent any confusion between taken slots and available slots.**
* **The garage can’t accept a number of cars more than the number of slots inside the garage.**
* **The garage should be secured to prevent any attempt of theft.**
* **The garage entrance and exit should be at 2 different gates.**
* **The garage should be open and available for use 24/7.**
* **Garage system should be up and running 24/7.**
* **The system can handle different exceptional scenarios and then display a message with the problem in hand, ex: if a car tries to enter when the garage is full the system displays a message that says the garage has no available slots.**

|  |  |
| --- | --- |
|  | **Details** |
| **Performance** | * **The system should response to the user within a time frame of 1 second.** |
| **Scalability** | * **The system should prevent any confusion between taken slots and available slots.** |
| **Security** | * **The garage should be secured to prevent any attempt of theft.** |
| **Robustness** | * **The system can handle different exceptional scenarios and then display a message with the problem in hand, ex: if a car tries to enter when the garage is  full the system displays a message that says the garage has no available slots.** |
| **Availability** | * **The garage should be open and available for use 24/7.** * **Garage system should be up and running 24/7.** |
| **Reliability** | * **The garage can’t accept a number of cars more than the number of slots inside the garage.** |

# 

# System Models

## Use Case Model :

## Use Case Tables

|  |  |  |
| --- | --- | --- |
| Use Case ID: | 1 | |
| Use Case Name: | Park in | |
| Actors: | Vehicle Driver | |
| Pre-conditions: | The garage should contain available slots. vehicle should be working. vehicle should have an ID. | |
| Post-conditions: | System reserved a slot and parked the vehicle successfully. | |
| Flow of events: | **User Action** | **System Action** |
| 1- The car arrives at the garage enter gate. |  |
| 2- Vehicle driver enters vehicle model name, model year, ID and vehicle dimensions. |  |
|  | 3- System checks for a suitable slot. |
|  | 4- System reserves the available suitable slot. |
|  | 5- System captures car’s entering time. |
| 6- Car parks at it’s specified slot. |  |
| Exceptions: | **User Action** | **System Action** |
| 1- Car arrives at enter gate. |  |
|  | 2- System checks for slots.  3- No available slots. |
|  | 4- Car leaves. |  |

|  |  |  |
| --- | --- | --- |
| Use Case ID: | 2 | |
| Use Case Name: | Park out | |
| Actors: | Vehicle Driver | |
| Pre-conditions: | The vehicle should be already parked in the garage. | |
| Post-conditions: | The System unreserved the slot and the vehicle leaves the garage | |
| Flow of events: | **User Action** | **System Action** |
|  | 1- Vehicle goes to exit gate to leave. |  |
|  |  | 2- System captures leaving time and calculates time spent in garage. |
|  |  | 3- System unreserve the slot which the vehicle was parked in. |
|  |  | 4- System calculates parking fees. |
|  | 5- Vehicle leaves through exit gate. |  |
| Exceptions: | **User Action** | **System Action** |
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| --- | --- | --- |
| Use Case ID: | 3 | |
| Use Case Name: | Add slots and their dimensions, Choose default parking method. | |
| Actors: | Garage owner. | |
| Pre-conditions: | Garage owner should be using the software | |
| Post-conditions: | Garage configurations are set up correctly. | |
| Flow of events: | **User Action** | **System Action** |
|  |  | 1- System boots up |
|  | 2- Garage owner add slots numbers  and dimensions of each slot |  |
|  |  | 3- system asks for the default parking method used. |
|  | 4- Garage owner selects either: -First suitable free slot -Best fit slot to reserve a slot in the garage for any vehicle. |  |
|  |  | 5- System saves the settings and implements it. |
| Exceptions: | **User Action** | **System Action** |
|  |  |  |

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| --- | --- | --- |
| Use Case ID: | 4 | |
| Use Case Name: | Display slots with their dimensions, check total income and vehicles no., Check available slots. | |
| Actors: | garage owner. | |
| Pre-conditions: | System is working properly. | |
| Flow of events: | **User Action** | **System Action** |
| 1- Garage owner displays available slots and their dimensions. |  |
|  | 2- System displays available slots and their dimensions. |
| 3- garage owner check total income and vehicles no. that parked in the garage up till now. |  |
|  | 4- System Displays total income and number of vehicles parked up till now. |
| Exceptions: | **User Action** | **System Action** |
|  |  |

# Ownership Report

|  |  |
| --- | --- |
| **Item** | **Owners** |
| Introduction | *Hoda, Hadeer* |
| Use case model | *Ahmed, Omar, Hoda, Hadeer* |
| Use case description | *Ahmed, Omar, Hoda, Hadeer* |