Concepts and methods assignment 1 report

**Introduction**

Within this assignment, we have planned and designed a car park simulator using C# programming. This report will contain a set of requirements that we will use while creating the simulator, a prototype of the simulator for an overview of what we the simulator will look like and while testing this prototype we will find areas of improvement and things we may have missed. Lastly, this report will include an evaluation of our project and how the development process worked.

**Requirements**

* Chip coin operated
* One entry and several exits of the car park
* Exits equipped with barrier and chip coin machines
* Prepaid system (Prepaid spaces)
* Drivers need to fully pay before leaving car park
* Car park displays structure at entrance as well as at the payment machines
* Employee and other discounts will be applied

**Update on requirements (Client questions and answers)**

**Design and Concepts**

**Is secured spaces on all of the spaces within the car park or are there set spaces for prepaid parking?**

There will be a set area within the car park for prepaid spaces, however with disability parking; family parking and other, these prepaid parking spots will be closer to the exits and entrances for easier access.

**What is the procedure for when a customer loses a chip coin?**

when a chip coin is lost, there will be an emergency call service for the customer where they can ring up and either pay for the park time space being used and the chip coin replacement on the phone or they have 14 days to pay (the car registration will be recorded) and the customer will be provided a code that will raise the barrier at the exit of the car park.

**Is their assigned parking and if so, how will this work with prepaid parking?**

at the entrance of the car park their will be a screen showing available spaces within the car park, customers are assigned a set of spaces that are available however they will have a choice between the spaces (will also show the available disabled and family parking spots). Prepaid parking will be assigned a car park so these spaces can be reserved. Employees will be assigned to prepaid parking.

**Is there disabled and family parking and if there are, how will they be implemented separately with other spaces?**

There will be disabled and family parking, and these will be assigned closer to the entrances and exits to make it easier for the customers, at the entrance it will show how many disabled and family parking spaces are available.

**How is the discount schemes implemented? Will we use technology like ANPR?**

Discount schemes will not be applied through ANPR (Automatic number plate recognition), however when the customer goes through the prepayment scheme they will send a chip coin that will have a set amount of entries and exit's and will be disabled once they have been used.

**Is there season passes for the car park and if so, then how long will they last and how will they be used?**

The customers will be able to buy a season pass within the discount scheme, this will have set dates and lengths for the season pass and the price will be lower than what the customer will have to have paid if they paid using the normal scheme. This will be applied for using the car parks website and the customer will receive a chip coin that will expire (will be disabled) when the set uses or time has been reached.\

**Walkthrough of final version**

**Entrance**

|  |  |  |
| --- | --- | --- |
| **Task Number** | **Task or Goal for simulator** | **Comment** |
| 1 | Start the program in visual studios using the run program button shown at the top of the page. | Pressing this button will run the program |
| 2 | Car requests to enters the Car Park | At this request, the entrance machine will print a unpaid ticket for the drives access to the carpark |
| 3 | Entry sensor is activated | When car arrives, the entry sensor is activated to show that there is a car at the entrance |
| 4 | Barrier lifts (Entry sensors activated) | After the driver receives a ticket, the barrier will open. |
| 5 | Barrier Closes (Entry sensors activated) | After the barrier opens for so long it will close. |
| 6 | Car enters car park | - |
| 7 | Entry sensor is deactivated | When car has entered car park, entry sensor will close |
| 8 | Spaces sensor -1 | Car park loses a free space |
|  |  |  |

**Payment system**

|  |  |  |
| --- | --- | --- |
| **Task Number** | **Task or Goal for simulator** | **Comment** |
| 1 | Driver inserts unpaid ticket (chip-coin) into payment machine (This is used to tell the machine how long the diver has been there to work out a price the driver has to pay). | Machine receives ticket to work out a price the driver must pay. |
| 2 | Pay machine sensor is activated. | When the pay machine is in use the sensor will be activated. |
| 3 | Driver inserts the amount of money that is owed into the machine. | - |
| 4 | Pay machine paid sensor is activated | Once the driver has paid the paid sensor should be active. |
| 5 | Driver takes paid ticket | Pay machine prints out a paid ticket |
| 6 | Pay machine sensor is deactivated | Once driver has finished using the pay machine the sensor is deactivated and waiting for the next customer |
| 7 | Pay machine paid sensor is deactivated | Once driver has finished using the pay machine the sensor is deactivated and waiting for the next customer |

**Exit**

|  |  |  |
| --- | --- | --- |
| **Task Number** | **Task or Goal for simulator** | **Comment** |
| 1 | Driver arrives at car park exit | - |
| 2 | Exit sensor is activated | Once the driver arrives at the exit the sensor is activated showing that a driver is wanting to leave |
| 3 | Driver enters prepaid or paid ticket(chip-coin) into the exit machine | - |
| 4 | Barrier senor is activated | Once the paid or prepaid ticket is entered the car park will allow the car to leave. |
| 5 | Barrier is lifted | - |
| 6 | Car leaves car park | - |
| 7 | Barrier shuts (After exit sensor is deactivated) | After the exit sensor is deactivated then the barrier will shut. |
| 8 | Barrier sensor is deactivated | - |
| 9 | Car park space sensor +1 | Adds a space to the available car park spaces |

**Testing**

Sensors broke n

Car paid or doesn’t leave?

What happens when losing a ticket (paid or not)?

**Evaluation**