Scooter Control System Technical Documentation

1. Hardware Requirements specifications

- Raspberry pi3
- RFID-RC522
- DC_Motors for(lockers)
- H. bridge driver
- Reading switch sensors
- One to ten (multiplexer) 74HC4067
- 10 Ampere power supply
- 10.1 inch screen for raspberry pi.

- Raspberry pi3 is used as a microcontroller you can use any raspberry pi's version except for raspberry pi zero.
- Use RFID-RC522 for reading rfid which will be integrated with 7 pins. The RFID-RC522 will be connected directly to the pi using pins wires female to female.
- Use Dc_motors as the spots lockers or any other magnetic locker that seem to work for you, in this system 10 lockers for each location are used and 40 lockers for 4 locations are used (a single location contains 10 spots) each spot contains one locker.
- H.bridge driver is the hardware that plays the role of passing electricity to the locker for opening and closing which is managed by a particular pin in the workflow of application. Think of H.bridge drivers as Relays because they almost do the same job(so some search about it).
- Reading switch sensors or (magnetic sensors) are used to detect if a scooter is actually given or taken, sensors are integrated with particalller pins, it reads if the scooter is out or in, in a boolean state 0 or 1 then it behaves according to each state. You can select pins of your choice so long so they are digital input and output.

- Multiplexer will play the role of providing you with more pins, as raspberry pi contains 40 pins only 28 are digital read and digital write which are not not enough to control rfid, lockers, and sensors. That is why you need more pins to get your job done. Find out how 74HC4067 works to provide you with more pins.
- You have to do a full Electronic and electric circuit which integrates all mentioned above hardware one by one to give one completed and integrated device. That will be reflected as SCS. use wires to make the circuit which may need some search from you. 10 Ampere power supply or 1 ampere power each can be used, this power supply is used to provide the hardware with power, for example you can give 5 voltages from it to raspberry pi, 12 voltages to lockers(DC_Motors) and 12 voltages to your screen.
- I used a 10.1 screen for raspberry pi you can use any size so long so it is a touch screen to provide you with the GUI in which fits your design size.

2. Software Requirements specifications

- Qt FrameWork
- Python3
- C++11
- Mysql-Database

- This project is mainly an Object oriented programming method, where classes and objects are used, make sure you are familiar with OOP in order to develop or redevelop such applications. Also, this project is an MVC (model view and controller), where classes are in different levels. And headers included based on class needs. Also, get some info on MVC before starting to develop this project.
- Use Qt FrameWork to provide you the code community and structure, Qt if the first one framework that is used to develop embedded software that does not make it the only one but it is the best one so far it supports c++, java, qml, javascript python and other programming languages. You can use the concept of GUI, Qml or xml to design the user interface.

- Python3 or any other version is used for the aim of developing a python script that enables you to read your ID card, find a way to include that script in you application so it could be called whenever a card is scanned and terminated after.
- C++11 or any other version can be used depending on your requirements. C++ is the official programming language that used to develop this application. Also, another OOP programming language can be used that is up to you.
- Use mysql or any other database community to store your user's data.
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- Finally refer to gunsel gitlab following the link below to know how to clone the application, and how classes and database are design(the directory contains the complete application -> https://gitlab.gunsel.com.tr/gunsel-it/scooter-control-system