AUTOMATIC CAR PARKING SYSTEM

Abstract

The concept of an automatic car parking system is shown in this study. Because of the increase in the number of vehicles on the road,traffic congestion is unavoidable. Everything in the world is becoming more automated, thus we designed a system that can detect the number of empty slots using Ultrasonic sensor located at the entry and exit, this automated car parking system decreases the time it takes to look for availability parking spaces by displaying the available spaces on LCD display.

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Introduction

Car parking is a huge issue in today’s congested cities,as the number of automobiles increases. In congested and densely populated urban areas, the availability of parking spots is growing severe, so car parking is a major concern. As a result, effective parking management systems are required. In this project we employed sensors to detect if a parking is occupied , as well as servo motor to emulate gain opening motors. LCD is used to see the availability of empty slots.

Identifying features

1. Ultrasonic Sensors are provided for easy detection of empty slots.
2. LCD to be used to see the status of the availability of parking slots.
3. Servo motors for simulation as gate opener motors.

State of art/Research

Car parking is a huge issue in today's congested cities, as the number of automobiles increases. In congested and densely populated urban areas,
the unavailability of parking spots is growing severe, so car parking is a major concern. As a result, effective parking management systems are required.

Requirements

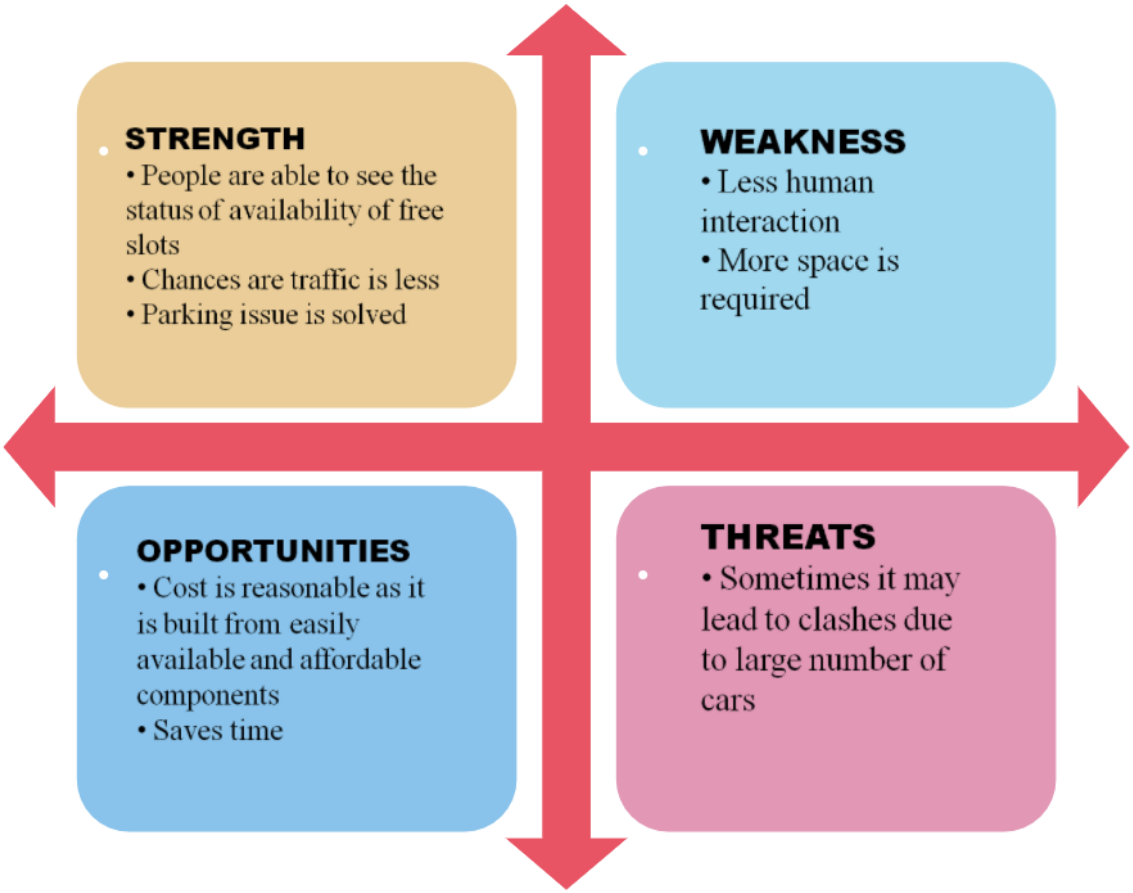
High Level Requirements

ID	DESCRIPTION
HLR01	The shall sense the availability of empty slots
HLR02	The system shall able to open and close the gate
HLR03	Shall be able to display the status of availability
HLR04	Shall be able to allow new cars

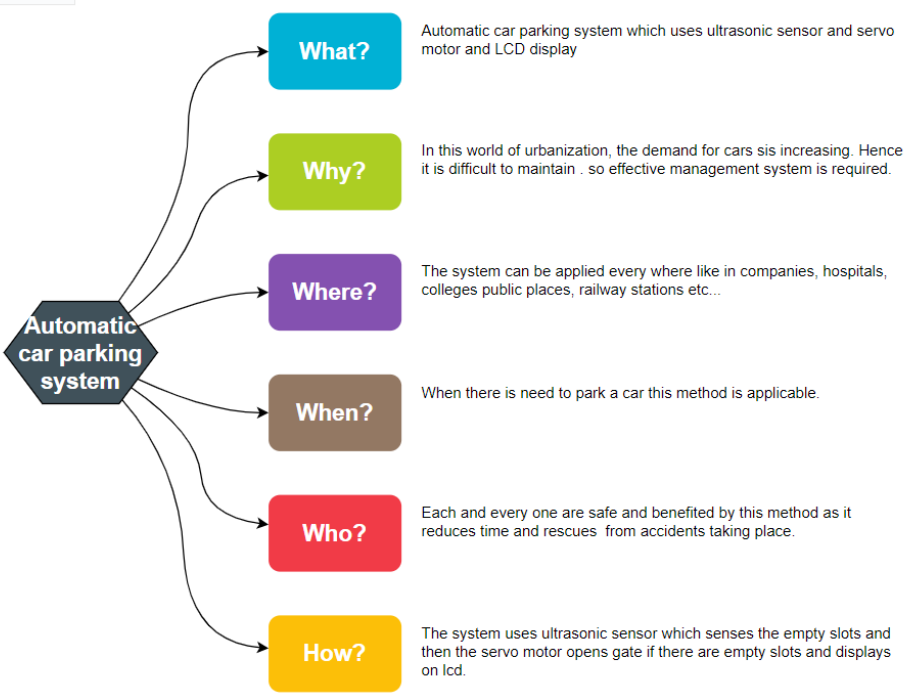
Low Level Requirements

ID	DESCRIPTION
LLR01	Ultrasonic sensors are used to sense the availability of empty slots
LLR02	The system shall use servo motor to open and close the gate
LLR03	On a 162 LCD, visitors may observe the status of the available free parking space outside the parking lo
LLR04	When the slots are empty it shall be able to allow new cars

SWOT analysis

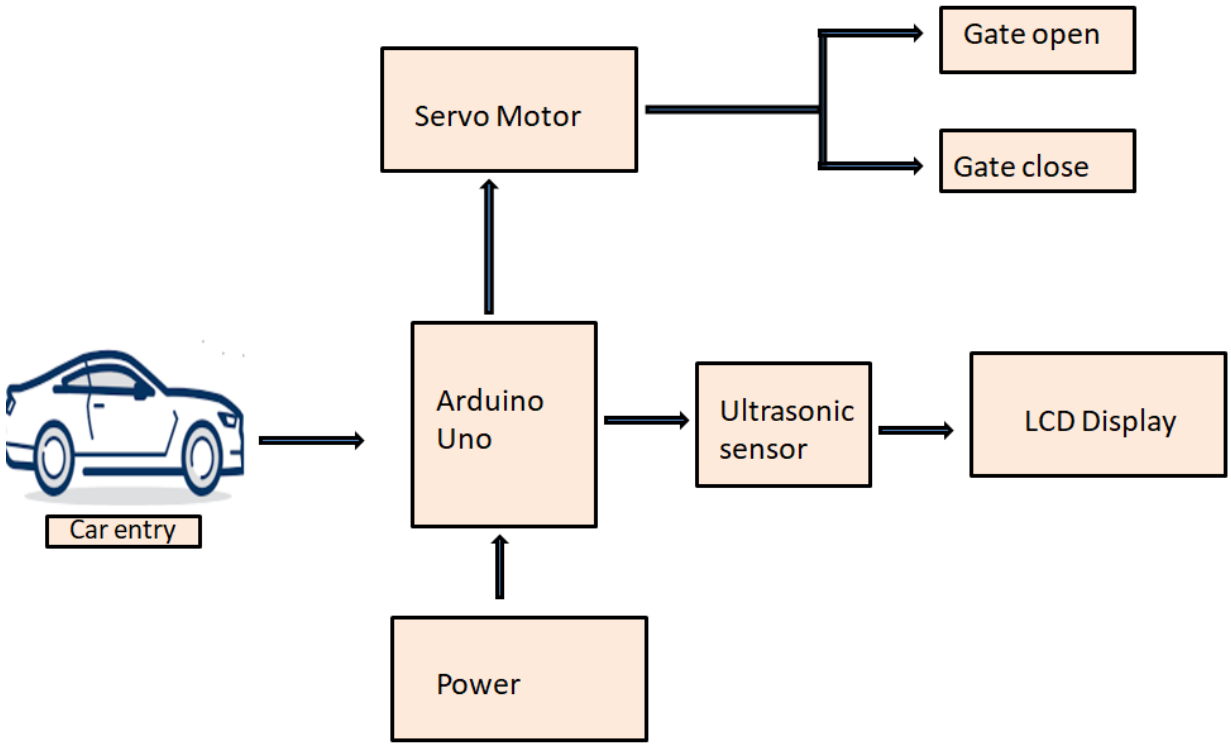


5W's and 1H


Automatic car parking system
What?
Automatic car parking system which uses ultrasonic sensor and servo motor and LCD display
Why?
In this world of urbanization, the demand for cars sis increasing. Hence it is difficult to maintain . so effective management system is required.
Where?
The system can be applied every where like in companies, hospitals, colleges public places, railway stations etc...
When?
When there is need to park a car this method is applicable.
Who?
Each and every one are safe and benefited by this method as it reduces time and rescues from accidents taking place.
How?
The system uses ultrasonic sensor which senses the empty slots and then the servo motor opens gate if there are empty slots and displays on lcd.

Architecture

Block Diagram Of Automatic Car Parking System



Components

* Arduino Uno

All sensors,motors and peripherals are interfaced witH Arduino Uno. Arduino senses the data and sends commands to LCD and Motors

* ULtrasonic Sensor

Ultrasonic Sensors are used to sense the availability of empty slots

* Servo Motor

The system shall use servo motor to open and close the gate

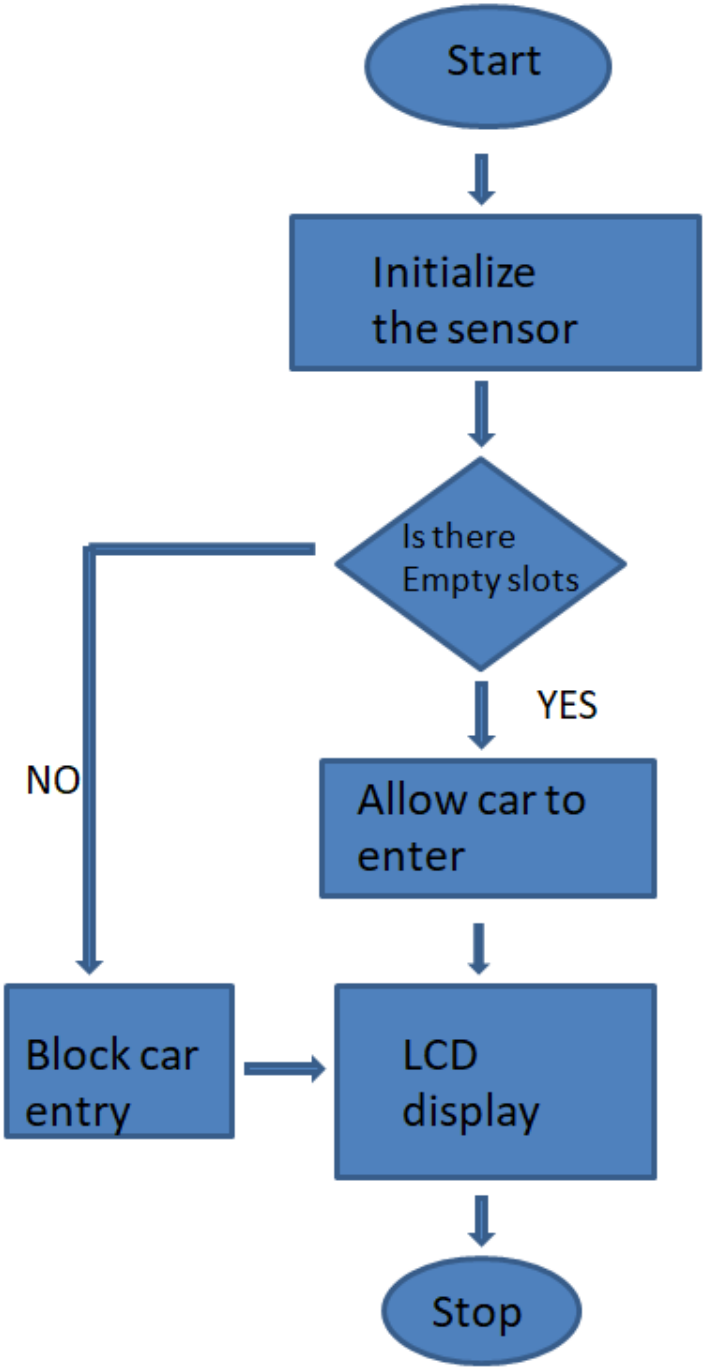
* LCD Display

On LCD, visitors may observe the status of the available free parking space outside the parking lot.

UML diagrams

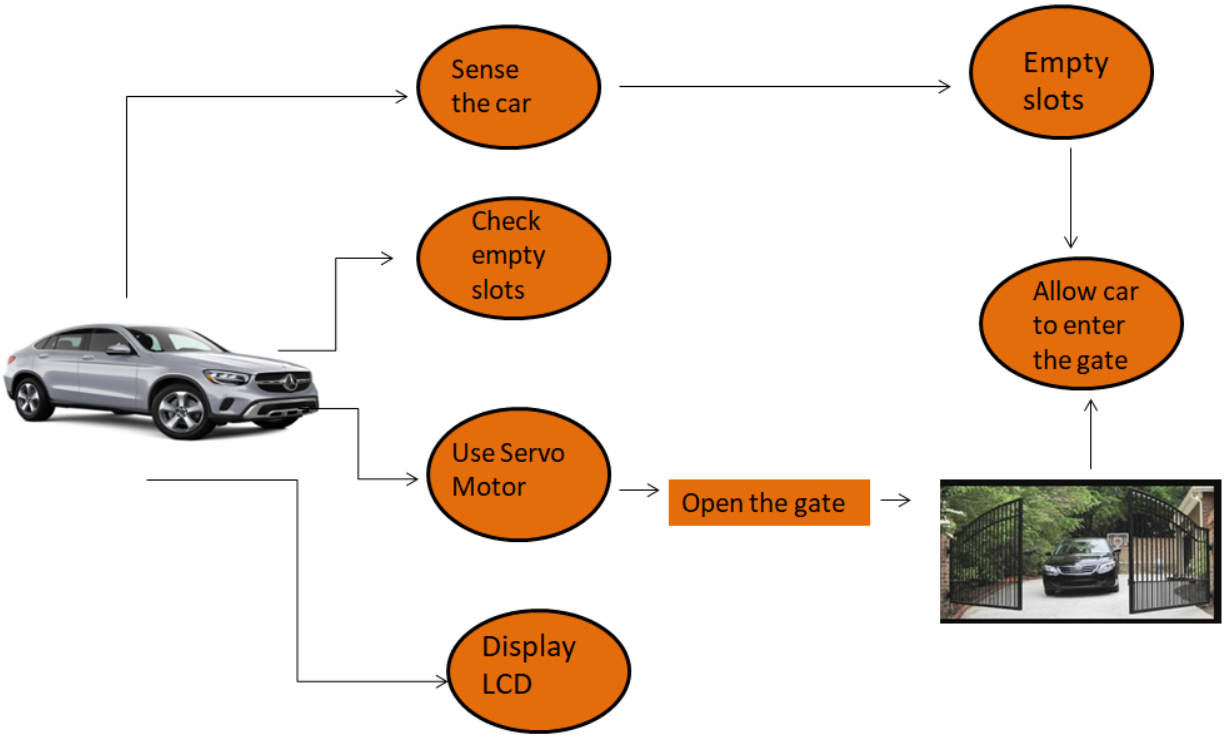
Behavioral diagram

Flow chart



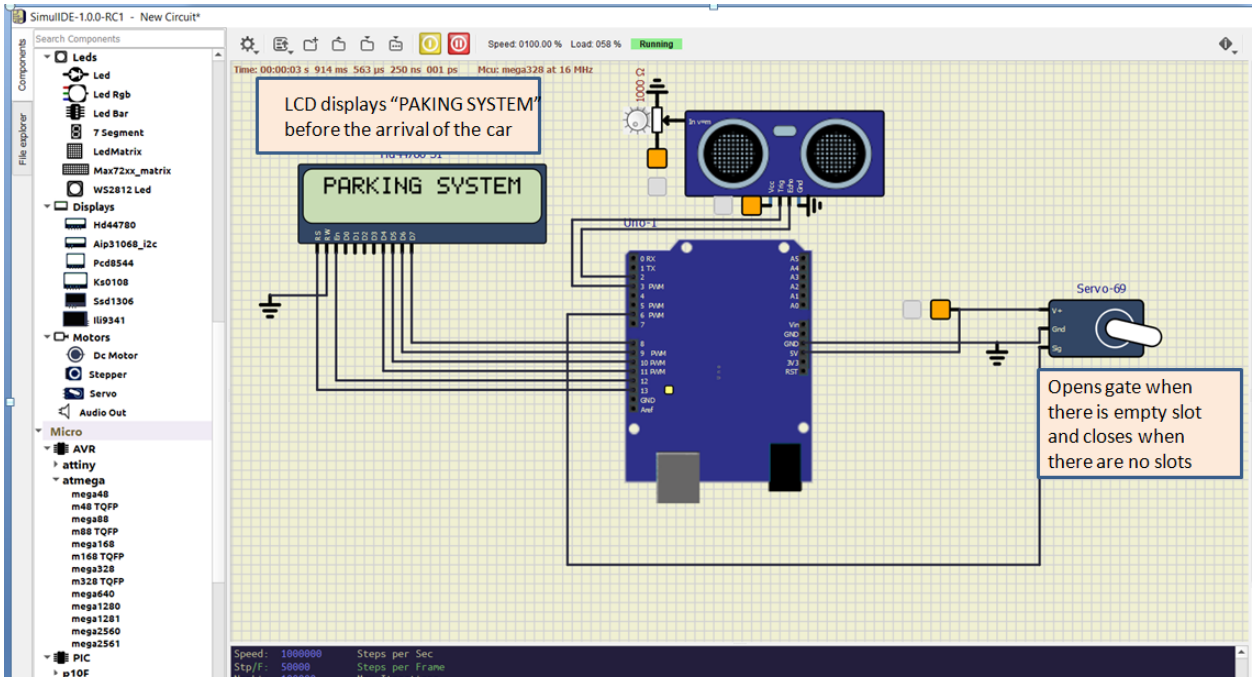
Structural diagram

Use case diagram

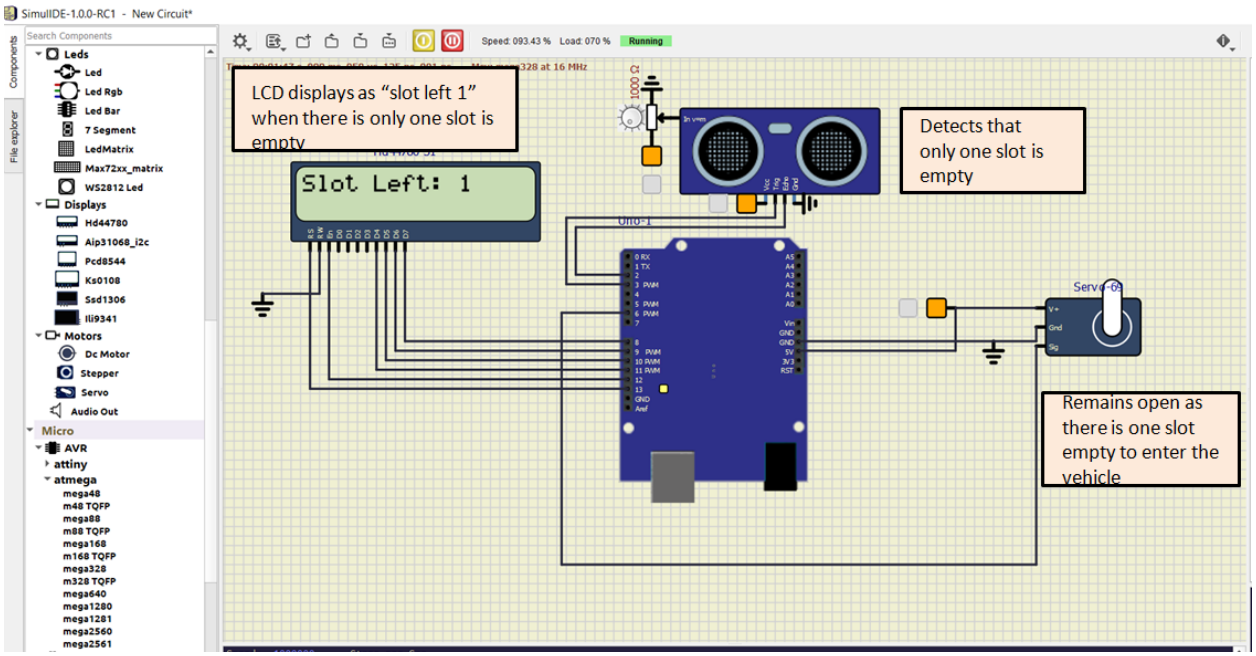


Implementation

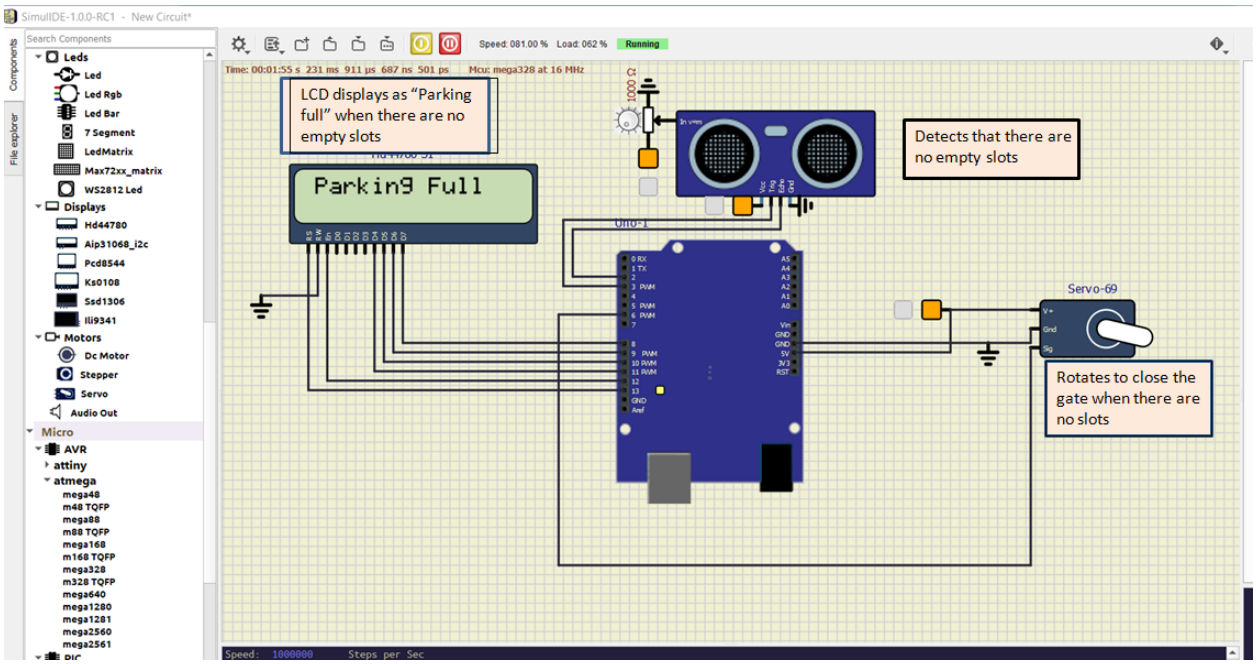
Before car arrives the LCD will be displaying as parking system



When the car arrives the sensor detects that only one slot is empty and the gate is opened



When there are no empty slots the sensor detects that no empty slots and gate is closed



Test plan

Test ID	Test case objective	Input data	Expected output
TC_01	If car arrives	car	Sensor should sense that car has arrived
TC_02	If car is present	Sensor input	Check the availability of empty slots
TC_03	If there is empty slot	Servo motor input	Open the gate
TC_04	No empty slot	Servo motor	Block the gate
TC_05	Open/Close gate	Servo motor	Display on LCD

Applications

1.This system is applicable wherever parking is possible
2.In Airports when the passengers need to park their car
3.In Bus stops,Railway stations.
4.In all public places like schools, colleges, etc...