

## MODULE – 2 PROJECT REVIEW

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### AUTOMATIC PARKING SYSTEM

# **Automated Car Parking system**

## **Description**

Automated Car Parking system is capable of finding empty slots that are available for parking automatically. if the slot is empty in the automated Car parking the new vehicles are allowed to enter the parking else the entrance is blocked by using servo in case no empty slot is found by system. The visitors availability of the free space outside parking on 16\*2 LCD.

## **Identifying Features**

- Shows Availability of empty slots that are available for parking automatically.
- Block the entry by servo motor if space is not available.
- Display of slot is full if no space for parking.

## **Components Required**

- Atmega328
- LCD display
- Servo Motor
- IR sensor
- Switch
- Buzzer
- Power Supply
- Resistor

## **Atmega328**

Atmega328 microcontroller is 8-bit AVR RISC -based microcontroller, 32KB Flash memory, 2KB SRAM, 23 GPIO lines, internal and external interrupt, 10-bit A/D converter, serial programmable USART ,The device operates between 1.8-5.5 volts.

## **LCD Display**

LCD stands for Liquid Crystal Display , It includes 2 rows where each produce 16-characters, operating voltage of LCD is 4.7-5.3V. Display can work in 2 -modes like 4 and 8 bit.

## **Servo Motor**

It is a motor that can rotate in great precision. It is a closed loop system where it uses a positive feedback system to control motion and final position of the shaft .The device is controlled by a signal generated by comparing output signal and reference input signal.

## IR sensor

It is used to detect the obstacle in front of the signal. It is digital output.

## Buzzer

It is a audio signalling device. It converts audio signal into sound signals.

## Switch

It is a device used for making and breaking of electric current in a circuit.

## SWOT Analysis

### SWOT ANALYSIS

#### STRENGTHS

- Less Human interaction
- Ease to use
- Reduce traffic
- Count of vehicle easily available

#### WEAKNESSES

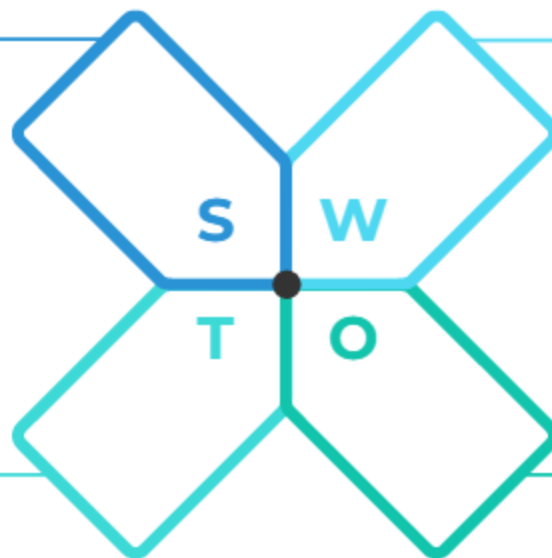
- Not connected to internet
- Control through mobile is not possible

#### THREATS

- System cannot work without power supply
- Replacement of component once manufactured

#### OPPORTUNITIES

- Less cost
- Consumes less power



## 5W and 1H



## High level Requirement

ID	HIGH LEVEL REQUIREMENT
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HLR1	LCD to display the parking slot and its availability
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HLR2	Detection of car through sensor
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HLR3	Barrier for vehicle entry using servo
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## LOW level Requirement

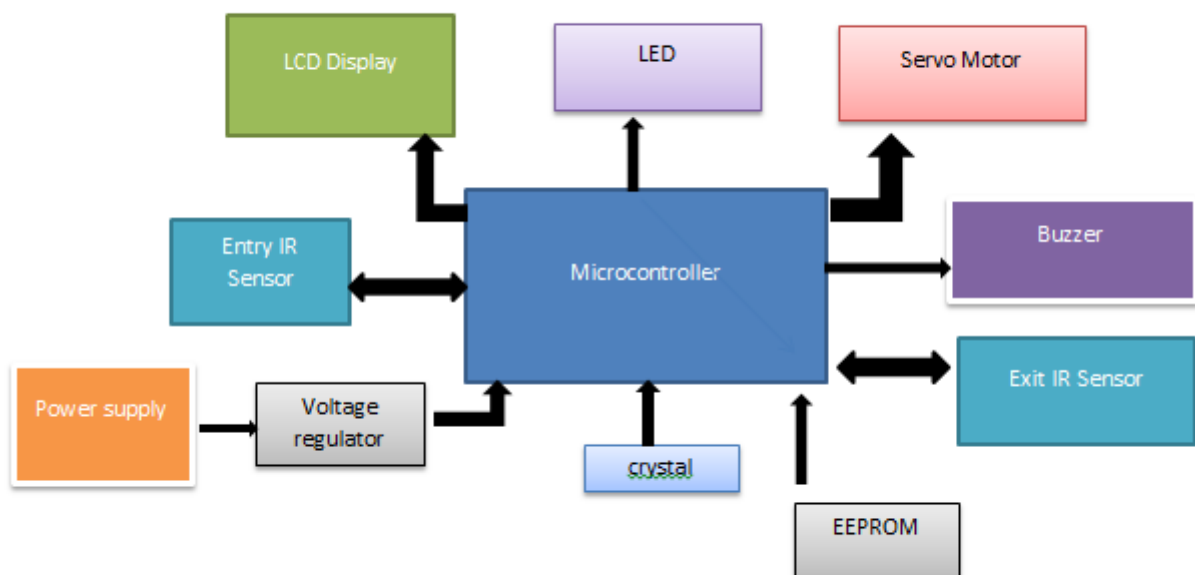
ID	LOW LEVEL REQUIREMENT FOR HLR1
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ID	LOW LEVEL REQUIREMENT FOR HLR2
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ID	LOW LEVEL REQUIREMENT FOR HLR1	ID	LOW LEVEL REQUIREMENT FOR HLR2
LLR1.1	LCD should display the parking system	LLR2.1	Sensor should detect car in entrance
LLR1.2	LCD Should display parking full if no space	LLR2.2	Sensor should detect the car during exit
LLR1.3	LCD should display slot empty		
ID	LOW LEVEL REQUIREMNT FOR HLR3		
LLR3.1	Servo rotate 90 degree when car slot available for entry		
LLR3.2	Servo will rotate when vehicle want to exit		
LLR3.3	Servo will not rotate if space is full		

## Block Diagram and its explanation

### Block Diagram



## **Sensors**

### **IR sensor**

There are 2 IR sensor used for entry and exit level of the system .For parking slot availability and exit of vehicle. IR sensor used to detect the vehicle .

### **Switch**

-To control servo open and close gate for vehicle entry.

### **Actuator**

### **LCD Display**

-Display the parking availability and slot is full in the system.

### **Servo motor**

- Block the vehicle and opening gate for vehicle entry

### **Buzzer**

- Intimate if slot is full.

## **MICRO CONTROLLER AND MEMORY**

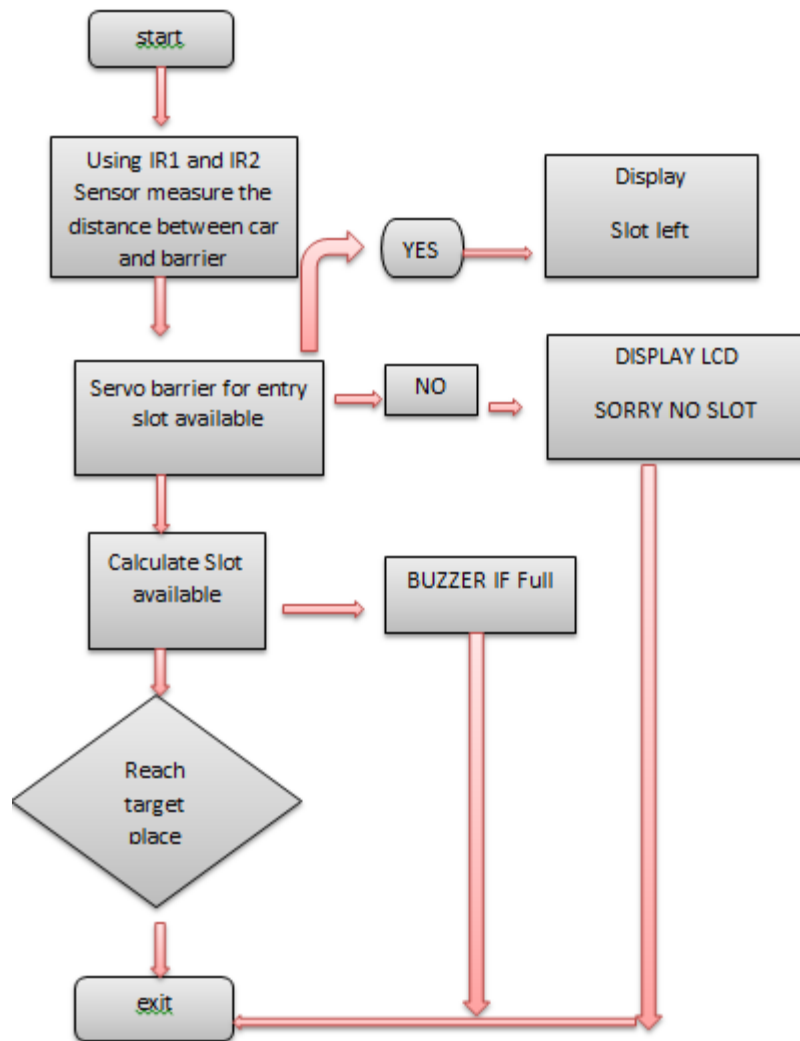
### **EEPROM**

- It is inside CONTROLLER

### **Microcontroller**

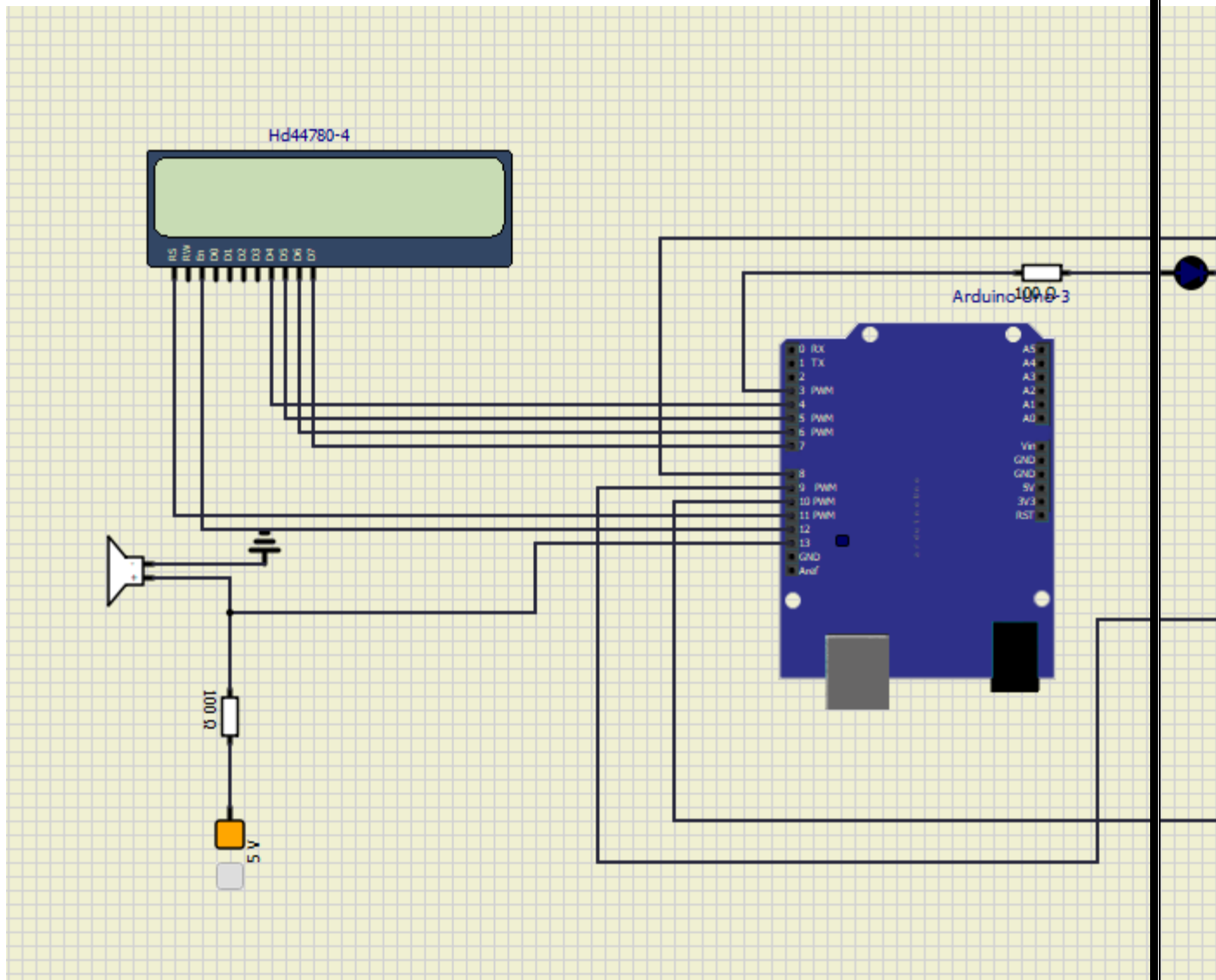
- This will control all the part of our system.This has all interface of LCD ,sensors, Actuators.

## **FLOWCHART OF SYSTEM**



**Behavioural Diagram**

**Circuit Diagram**






## Test Plan And Output




### High level Test Case

Test ID	Description	Expected i/p	Expected o/p	Actual O/p	status
HLR1	LCD Display On	Program execution	LCD should Display "Parking System"	Display "Parking System"	✓



Test ID	Description	Expected i/p	Expected o/p	Actual O/p	status
HLR2	IR SENSOR1 Detect Vehicle entry	User execution	Check for slot availability and Open barricade	Check the availability and open barricade	
HLR3	IR SENSOR2 Detect Vehicle entry	User execution	Check for slot availability and Open barricade	Check the availability and open barricade	
HLR4	Servo rotation when ir sensor detect vehicle and made to allow	Program Execution	Servo rotate 90 degree	Servo rotate 90 degree	

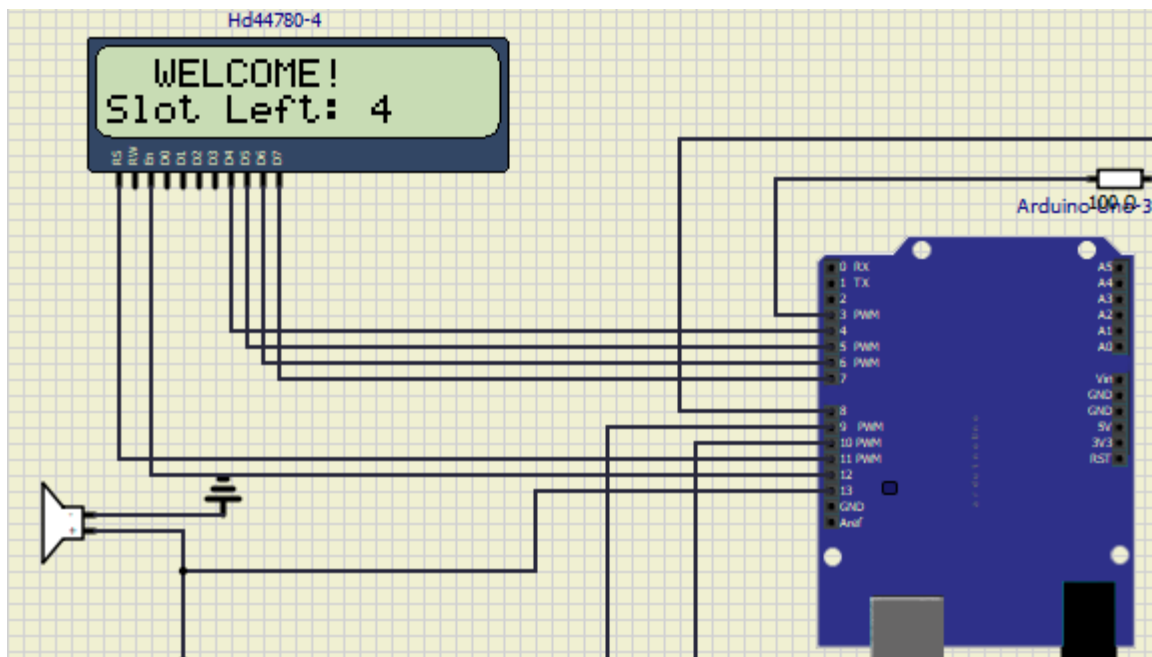
## Low level Test case

Test ID	Description	Expected i/p	Expected o/p	Actual O/p	status
HLR1					
LLR1	LCD Display Slot availability	user input	Display welcome slot available	welcome slot available	
LLR2	LCD Display Slot full	user input	Display Sorry no slot	sorry no slot	
HLR2					
LLR1	IR Sensor1 detect vehicle but slot is full	user input	led blink	led blink	

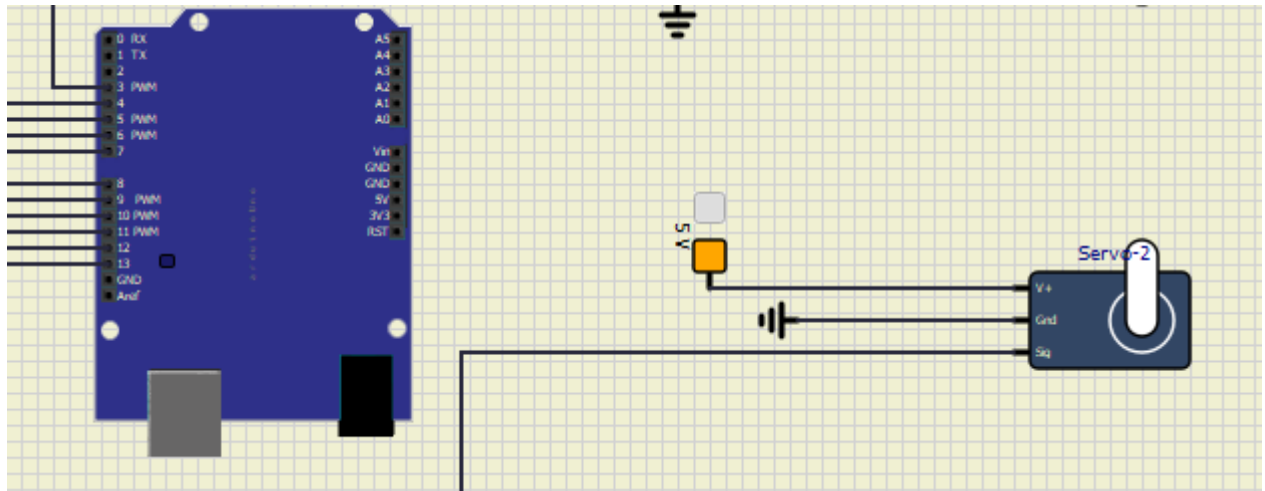
Test ID	Description	Expected i/p	Expected o/p	Actual O/p	status
	led on				
LLR2	IR Sensor1 detect vehicle no slot available	program execution	BUZZER sound	Buzzer Sound	✓
HLR3					
LLR1	SERVO Rotation for entry of vehicle	program execution	Servo rotate	Servo rotate	✓
LLR2	Servo Rotation for exit of vehicle	program execution	Servo Rotate	Servo Rotate	✓

## Test Output

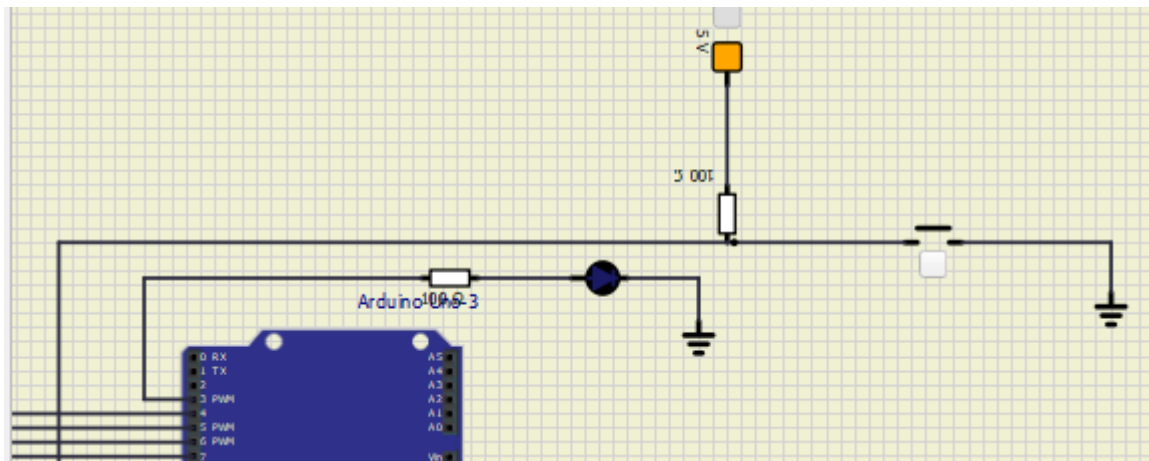
### For LCD



## For Servo



## For iR Sensor and LED



## For Buzzer

