ACKNOWLEDGEMENT.

The satisfaction that accompany the successful completion of any task would be, but impossible without the mention of the people who made it possible, whose constant guidance and encouragement helped us succeed.

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RAKSHA CHANDRA (1NH18EC092).

RAKSHA KRISHI (1NH18EC093).

RAKSHITH (1NH18EC094).

VAISHAK.LAKSHMANAN (1NH18EC117).

TABLE OF CONTENTS.

LIST OF FIGURES.

LIST OF TABLES.

ABSTRACT.

These days there is huge rise in the number of vehicles that are on the road, and due to this traffic problems are bound to happen. These traffic problems are also caused in parking lots especially during holidays. To cope with the number of vehicles today, and to solve problems related to traffic and parking, an automatic parking system was developed.

This project helps in providing an automatic parking system which is user-friendly and reliable.

These kind of parking systems are already in use in certain parts of the world and they can be developed in various methods.

This system proposed helps in reducing the time a person takes to search for a free parking slot and it also helps in reducing any human interference. It helps in reducing congestion or traffic that can form when a person is searching for a parking slot.

Our system consists of a sensor that is placed in a parking slot and this sensor helps in processing the information through a series of full adders, parallel adder, a binary coded decimal segment and a 7-segment display.

The information about the parking slot is displayed on the 7-segment display.

CHAPTER 01.

INTRODUCTION.

As in the modern world, everything is going automatic and parking is a necessity that is now-a-days Turing out to be a burden due to the lack of space and wastage of time. Due to these problems an automatic parking system is developed.

The main idea of the automatic parking system was developed due to a need for parking spaces and a scarcity of available land.

An automatic parking system is a mechanical system that is designed in order to minimize the area and volume required for parking cars.

This type of a system is mainly implemented in Europe, the united states and japan (in a large scale). The system is developed using advanced technologies and researches from various studies. It is hoped that it would solve the currently faced problems like traffic, time consumption and human interference.

They are generally used in places where a multi-level parking system would be very expensive, too large and impractical.

The automatic parking system takes advantage and aims only to reduce the parking space.

- The Largest Automatic Parking lot in the world is in Al Jahra, Kuwait. It provides 2314 parking slots.
- The World's Fastest Automatic Parking lot is in Wolfsburg, Germany. It has a retrieval time of 1 Minute and 44 seconds.
- The largest automatic parking lot is in Europe is Aarhus, Denmark. It consists of 1000 parking slots and has 20 car lifts.

CHAPTER 02.

LITERATURE SURVEY.

Automatic or intelligent parking systems can be developed through various methods.

- One method is by using image processing.

  An image is captured from the parking slot and then is converted into a binary code and processed to display a free slot to park by determining the area around the slot. This image is shown on a 7-segment display. The 7-segment display, displays the number of available parking slots.

- The second method is by using a coordinate system.

  Automatic parking systems can also be implemented through a vision based method. Images of vehicles are considered as positive images and free slots are considered as negative images. And slots are allocated accordingly. There are many disadvantages associated with this kind of a system, it includes camera quality and the position in which the camera is placed.

- A third method called number plate recognition can also be used.

  A picture of the license plate of a vehicle is captured and ultrasonic sensors are used to detect free parking slots. In sync with the processing of the license plate and detection of free slots the timings of the parked vehicles are also observed. There are limitations with this system too, as it can recognize license plates with only one row.

- Another parking system is done using multi-level parking.

  Pictures of the license plates of cars are taken and processed to ensure safety. And lifts are used to park vehicles in multiple levels. This method can be time consuming but it reduces the chances of congestion.

- These parking systems are mainly used to prevent human interference and also to overcome any glitches faced in the existing systems.

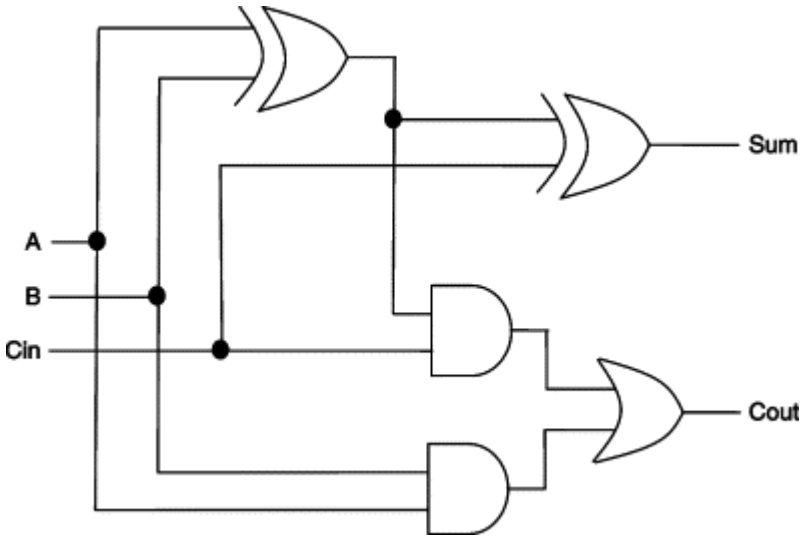
CHAPTER 03.

PROPOSED METHODOLOGY.

The methodology we used is converting the slots into binary by using a sensor. 1 if the slot is occupied and 0 if its free. Then these binary values are inverted using a not gate and the feed to a full adder. The full adder counts the empty slots in the parking lot using sum and carry and then the output is given to a parallel adder as input which does arithmetic addition of the input from both the full adder and gives the arithmetic sum of the two. This number is then send to a decoder to convert to a seven segment display .

A	B	Cin	Sum	Cout
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

TAB(1)



FIG(1)

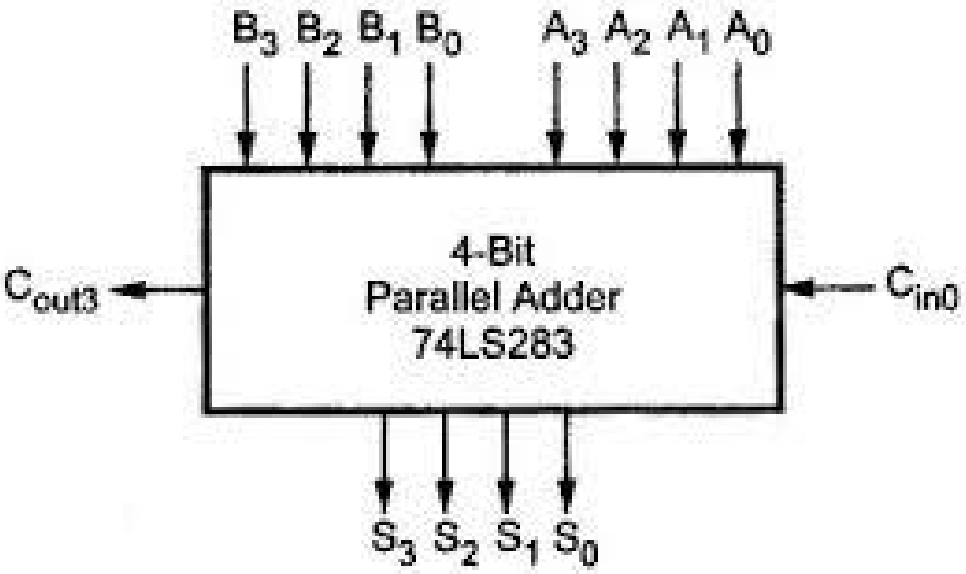
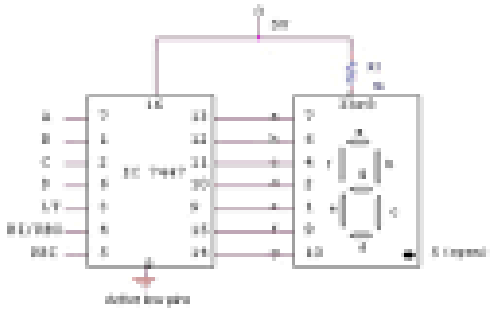


Fig. 3.28 Functional symbol for the 74LS283

FIG(2)

FIG(3)

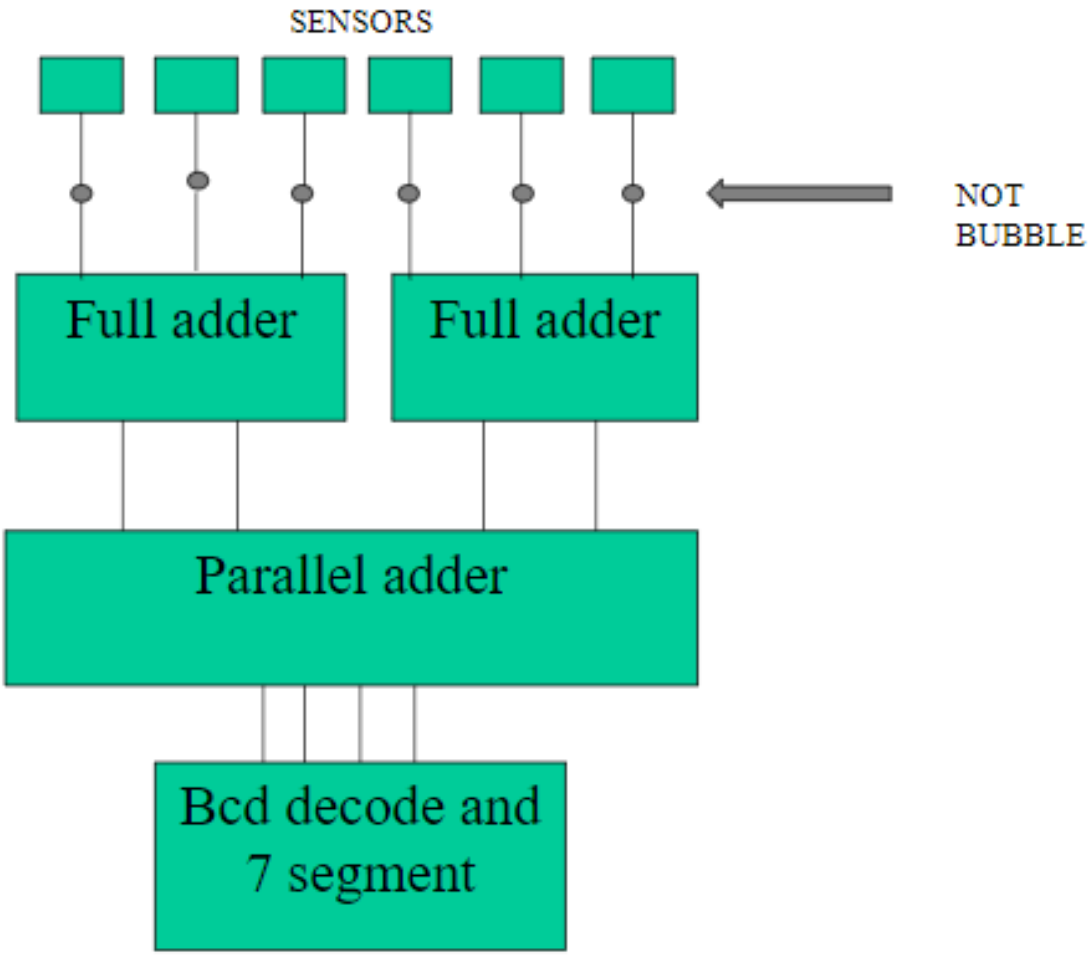


TRUTH TABLE:

BCD Inputs				Output Logic Levels from IC 7447 to 7-segments							Decimal number display
D	C	B	A	a	b	c	d	e	f	g	
0	0	0	0	0	0	0	0	0	0	1	0
0	0	0	1	1	0	0	1	1	1	1	1
0	0	1	0	0	0	1	0	0	1	0	2
0	0	1	1	0	0	0	0	1	1	0	3
0	1	0	0	1	0	0	1	1	0	0	4
0	1	0	1	0	1	0	0	1	0	0	5
0	1	1	0	1	1	0	0	0	0	0	6
0	1	1	1	0	0	0	1	1	1	1	7
1	0	0	0	0	0	0	0	0	0	0	8
1	0	0	1	0	0	0	1	1	0	0	9

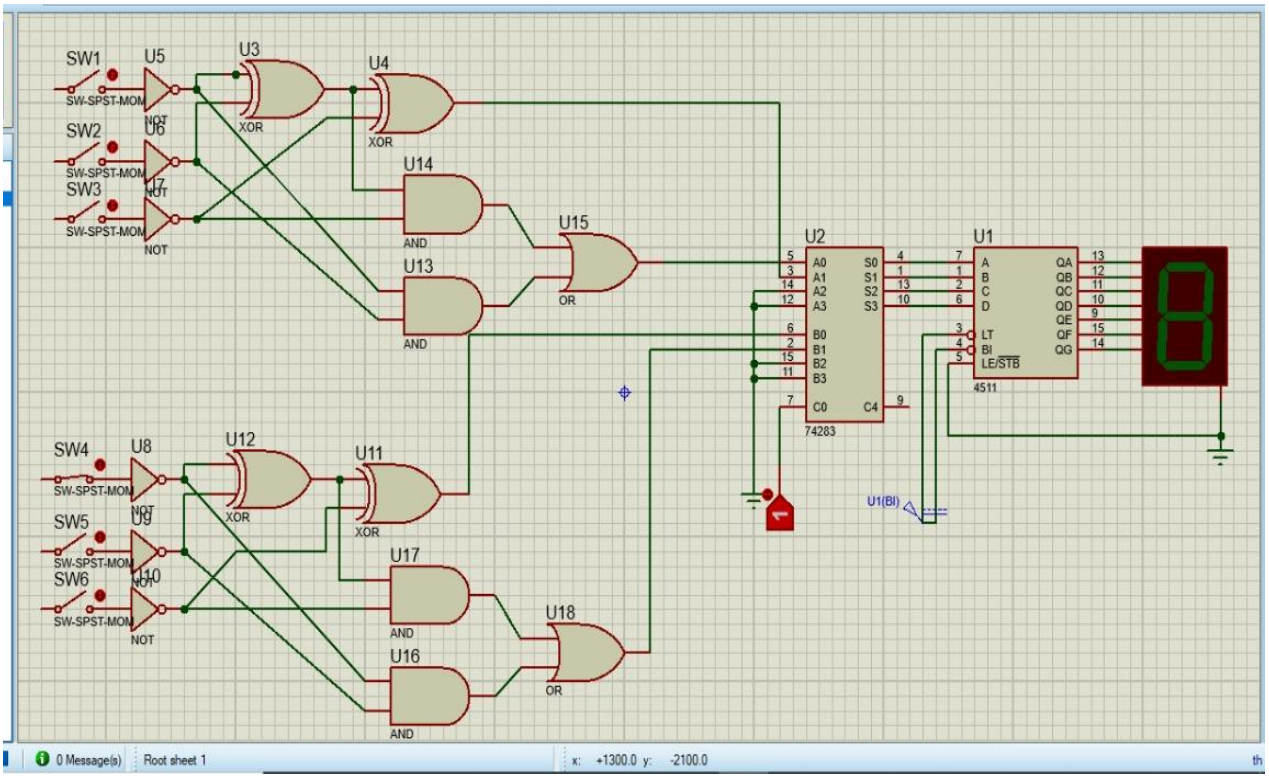
TAB(2)

BLOCK DIAGRAM :



FIG(4)

CIRCUIT DIAGRAM :



WORKING :

Sensors are placed under the parking slots and when a vehicle goes over the sensor, the

sensor sends a signal to a NOT gate and the output of the Not gate is given to the full adders (the full adders used consist of two XOR gates, two AND gates and one OR gate as shown in the figure).

- A full adder is a logical circuit that performs an addition operation on three one-bit binary numbers. The full adder produces a sum of the three inputs and carry value.

The output of both the full adders (i.e. The sum and carry of the data given to the full adder) is given to the parallel adder.

- A parallel adder is a digital circuit capable of finding the arithmetic sum of two binary numbers that is greater than one bit in length by operating on corresponding pairs of bits in parallel.

The parallel adder then adds the data provided and sends it to the binary coded decimal segment (BCD). The BCD converts the input into a 7 segment input and sends it to the 7 segment display.

CHAPTER 04.

PROJECT DESCRIPTION.

OBJECTIVE :
The main objectives of this project are:

- To develop an automatic parking system which is user-friendly and reduces time consumption.
- To provide a safe parking slot .
- To develop a parking system that reduces human interference (man work).

PROBLEM STATEMENT :

There are various problems faced when car parking is considered:

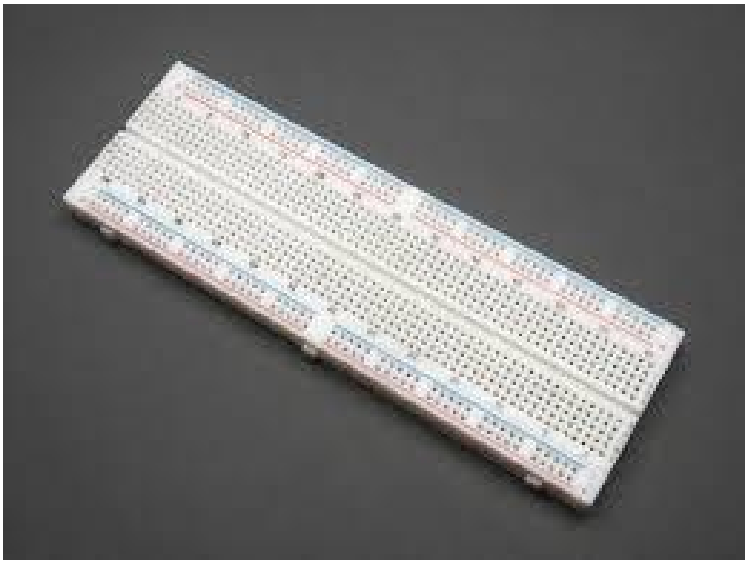
- Problems in parking lots – it is very difficult to find free parking slots in a car park (specifically during holidays). The search for a slot can consume a lot of time.
- Improper parking – this happens when one vehicle takes up two parking slots. This generally happens in careless situations and it is important to solve this problem as others will not be able to find slots for their vehicles.

COMPONENTS REQUIRED :

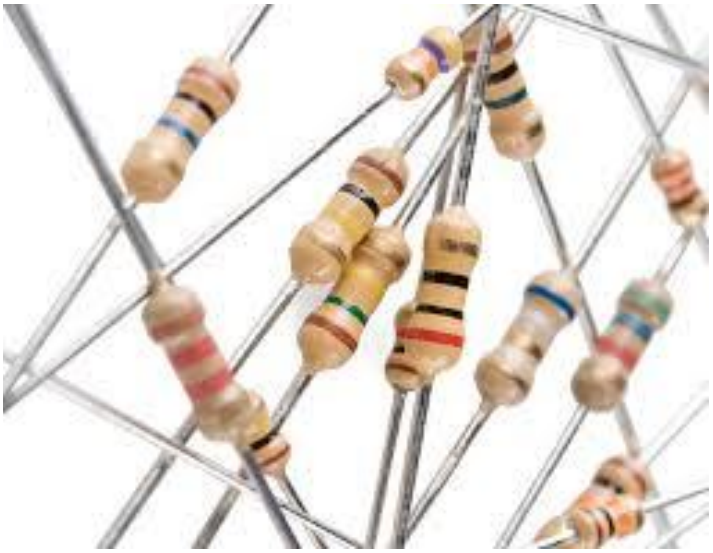
- Sensors.
- Two full adders (the full adders consist of two XOR gates, two AND gates and an OR gate).
- A parallel adder.
- A binary coded decimal (BCD) segment.
- A 7 segment display.
- Wires.
- A breadboard.
- Resistors (220ohms)
- LOGIC LY SOFTWARE

IR SENSOR

JUMPER WIRES



BREAD BOARD



RESISTORS

APPLICATIONS:

- These kind of systems are mostly used in areas where multi-level car parks cannot be used due to lack of space, or the high cost of such parking systems.

- They are applied in free-space areas like a shopping mall car park or a parking lot at a grocery store.

- They can also easily be applied under buildings above grade and under buildings below grade.

CHAPTER 05.

RESULT AND DISCUSSION.

The seven segment displays the number of available slots so that there is no need to go in and check if there is a vacant space or not. This doesn't need manual work and is easy and efficient.

CHAPTER 06.

ADVANTAGES AND DISADVANTAGES.

ADVANTAGES :

- improve comfort and safety.
- less chances for vehicle vandalism.
- Emissions are reduced.
- Very helpful in small parking lots.

DISADVANTAGES :

- Technical problems may lead to difficulties.
- These systems are better off in areas like shopping malls and train stations, they can not be applied in areas like stadiums or places where the crowd is out of control.
- Users who are not familiar with this kind of a system can find it difficult to use.

CHAPTER 07.

CONCLUSION AND FUTURE SCOPE.

CONCLUSION :

The model has to be analyzed while developing. The main advantages of this system is that, it is cost effective, safe and user-friendly. It also helps in reducing manpower.

FUTURE SCOPE :

An automatic parking system has a lot of future scope as it is something that is needed on a global scale.

- This system can be upgraded in terms of the quality of the components used. Better sensors, improved detection….these upgrades help in making the automatic parking system more user-friendly.
- This system can further be evolved to an extent where people can book their parking slots ahead of time. This can be done using special applications and this helps to reduce the amount of time a person spends in searching for a free slot.

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APPENDIX.

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