Digital Logic Design Project Abstract

SMART CAR PARKING SYSTEM

BEE 11-B GROUP NUMBER 4

NATIONAL UNIVERSTIY OF SCIENCES AND TECHNOLOGY | H-12 Sector Islamabad

TEAM LEADER:

Name: Ch. Muhammad Shaheer Yasir   Registration Number: 286021

TEAM MEMBERS:

Name	Registration Number
Farheen Gul	290352
Muhammad Hamza	290951
Amna Abid	321913

ABSTRACT OF PROJECT:

One of the major techniques that forms the basis of all digitally integrated circuits is Digital Logic Design. Using these techniques we have come forth with a system aimed at aiding drivers with parking.

Due to the rapid increase in the number of vehicles on the road, traffic problems are also on the rise. This is due to the fact that the current transportation infrastructure and car parking facilities developed are unable to cope with the influx of vehicles on the roads. One main problem is revealed to be the lack of a proper system to help vehicles park efficiently, given the exponential rise of huge parking areas and vehicles alike.

To alleviate the aforementioned problems, we have developed a "Smart Parking System". With the implementation of the Smart Parking System, patrons can easily locate and secure a vacant parking space at any empty car park spot that is deemed convenient by them.

The main aim of this project is to effectively and efficiently provide a system that; helps in reducing the traffic that occurs within parking lots, furthermore works to reduce the time lost while searching around a place that is already at maximum capacity. Vehicle detection plays a crucial role in this, as the smart parking system is implemented through a system that uses the help of various sensors and counters, which help in keeping a check where a spot in the parking lot is currently empty and guides the drivers to that spot with the help of LEDs. In the entrance of the Parking Lot, a screen displays the car park map, showing where all the car parking spots are located and which spot is currently available for parking at that moment. Furthermore the system only allows entry to a specific number of vehicles that bring the parking lot to its maximum capacity, and thus blocks entry for any more vehicles that tries to enter. A red LED turns on in the entrance once the maximum capacity of the car park is reached.

The smart parking system is considered beneficial for the car park operators, car park patrons as well as for the conservation of the environment as it significantly reduces the amount of fuel burned going around in circles trying to find an empty spot. As this system is completely digitally implemented, there is no more need for Parking Workers, thus reducing the overall cost required to maintain the huge parking spots that are located outside of shopping malls, theaters, hospitals and airports e.t.c. Thus the implementation of this project solves problems from an environmental perspective to the perspective of a business where the cheapest yet most efficient solutions are preferred to avoid the expenditure of unnecessary excess money.

In Conclusion, the Smart Parking System is proposed to help combat the problems that arise in parking lots by providing a system that helps drivers to smoothly and quickly allocate an area to park without creating unnecessary traffic jams and wasting time going all around the parking lot.

BLOCK DIAGRAM OF SYSTEM PROPOSED:

SMART CAR PARKING SYSTEM
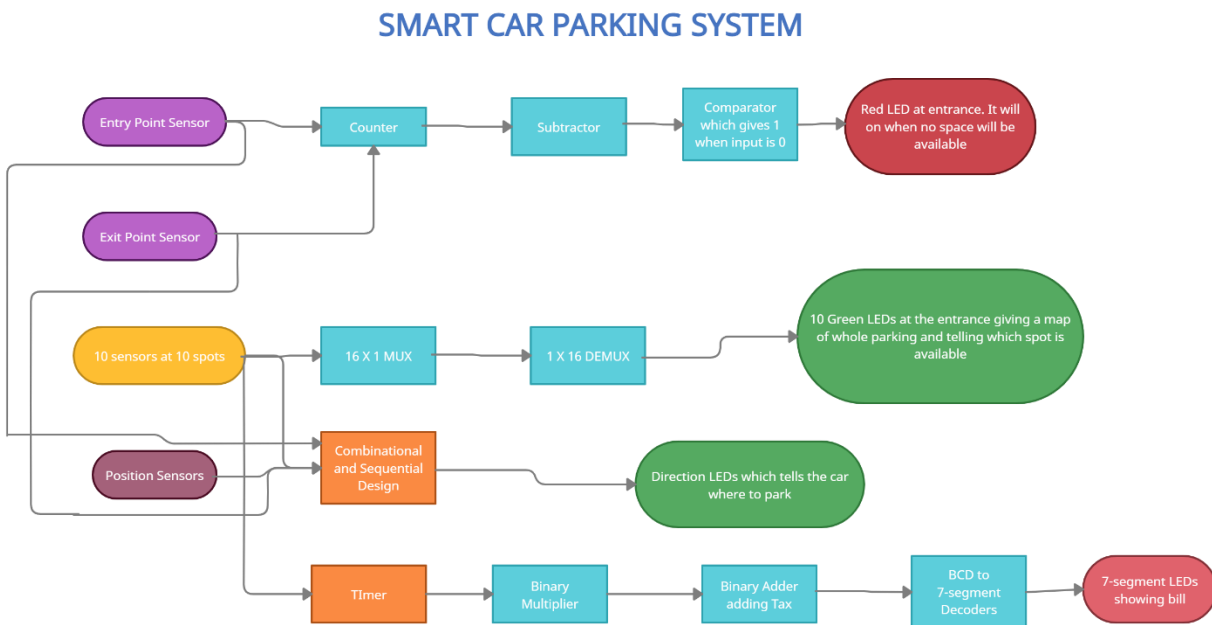
DIVISIONS OF WORK ALLOCATED:

The team leader divided the technical work of the project into four parts and allocated each member one of them. The work division is as follows:

1. ## Ch Muhammad Shaheer Yasir:

   The leader assigned himself the design of direction LEDs. These LEDs will take input from entry point sensor, sensors at parking spots and position sensors and once the driver will enter in the parking, these LEDs will tell him/her where to park. Moreover if the driver don't park on the spot specified to him ,the position sensors will give input to system and the system will turn off the previous LEDs and turn on new LEDs to tell driver which next spot is available in the parking. Also, as soon as the car is parked, all direction LEDs will turn off.

2. ## Farheen Gul:

   She was assigned to design the billing system of car parking. As soon as the car is parked in the parking lot, the system will start a timer and the timer will be stopped when the car finishes its parking. The timer will store the time of car parking and then send the output to binary multiplier which will multiply the time with rate specified per half hour. There will also be an input to timer which will reset it as soon the billing is done.

3. ## Muhammad Hamza:

   He was assigned to design the car parking map at the entrance which gives the driver a visual depiction of which spots are available, and which are filled. The system will take input

from 10 sensors at 10 parking spots and then a multiplexer will convert their inputs to one output. That output is again demultiplexed at the entrance giving 10 outputs which are then connected to LEDs in the parking map.

4. Amna Abid:

She was assigned to design the red LED at the entrance which will only turn on if there is no space available. Also, when there will be no space available, the gate of the parking system will not open until some car leaves the parking. She was also assigned to design the binary adder in the billing system. This adder will add tax dynamically according to the time input given.