

EMBEDDED SYSTEM DESIGN

Assignment #1

Project Title: Automated Parking Lot

Group Members

Momin Munir

Hasan Saeed

Saqib Javed

Abbas Ahmed Siddiqui

Saad Abdul Majid

M.Ibrahim Zafar

Instructor : Sir Awais Kamboh

Date: 28th Dec,2016

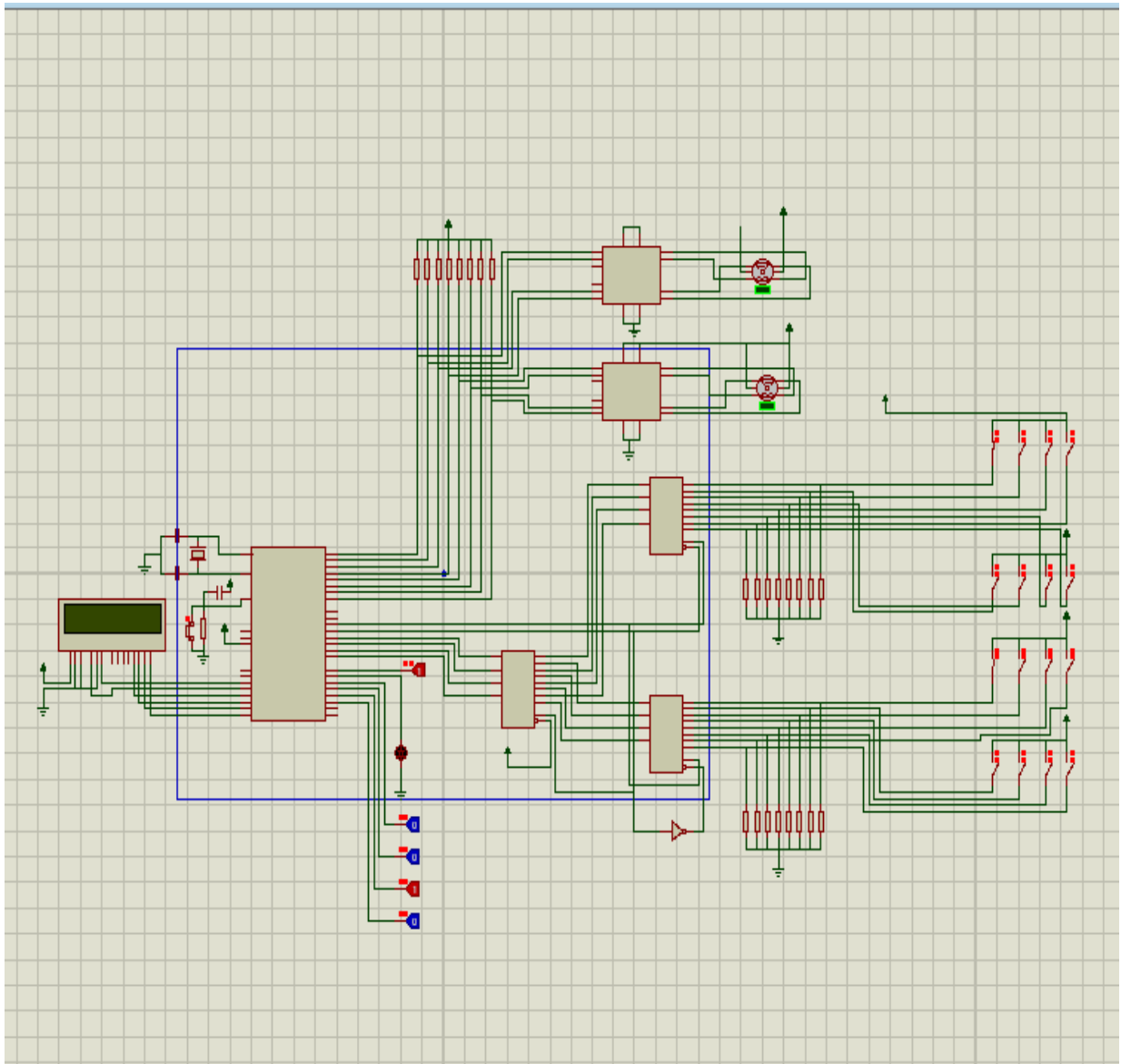
- **Project Overview:**

Our project smartly tackles the parking problem that occurs anywhere where managing parking is an issue. Entry and exit barriers are controlled through multi-level IR sensors, 2 sensors at each barrier. 2 sensors are placed in order to detect the presence of vehicle and also the size of vehicle according to which the barrier will be lifted to a particular height. The counts status is updated on LCD display. Switching of parking lights is done through LDR and through presence of vehicle as well. As the instructor asked, we will also be doing multiplexing to support 16 or more vehicle slots through a single controller. This will help the car entering to know where the empty car spaces are which will help in reducing the fatigue and time for the driver.

- **List of Tasks:**

- 1) Stepper Motor Control
- 2) Parking Space Availability through De-multiplexing
- 3) LCD display for count of cars
- 4) Automatic lighting system using LDR
- 5) Simulation on Software
- 6) Implementation on hardware using 8052.

- **Schematic Diagram:**



- **Hardware Components:**

- 1) LEDs
- 2) LDR
- 3) 16x2 LCD
- 4) 2 Stepper Motors
- 5) 8052 Microcontrollers

- 6) Switches for parking spaces
- 7) 4 IR sensors
- 8) Three 4 bit 2x1 De-Multiplexers for multiplexing parking spaces
- 9) Resistors for LEDs
- 10) Stepper Motor Driving IC (L293D)
- 11) Crystal Oscillator
- 12) NOT gate
- 13) Wires
- 14) Capacitors for reset circuit

- **List of Software:**

- 1) Proteus
- 2) Keil

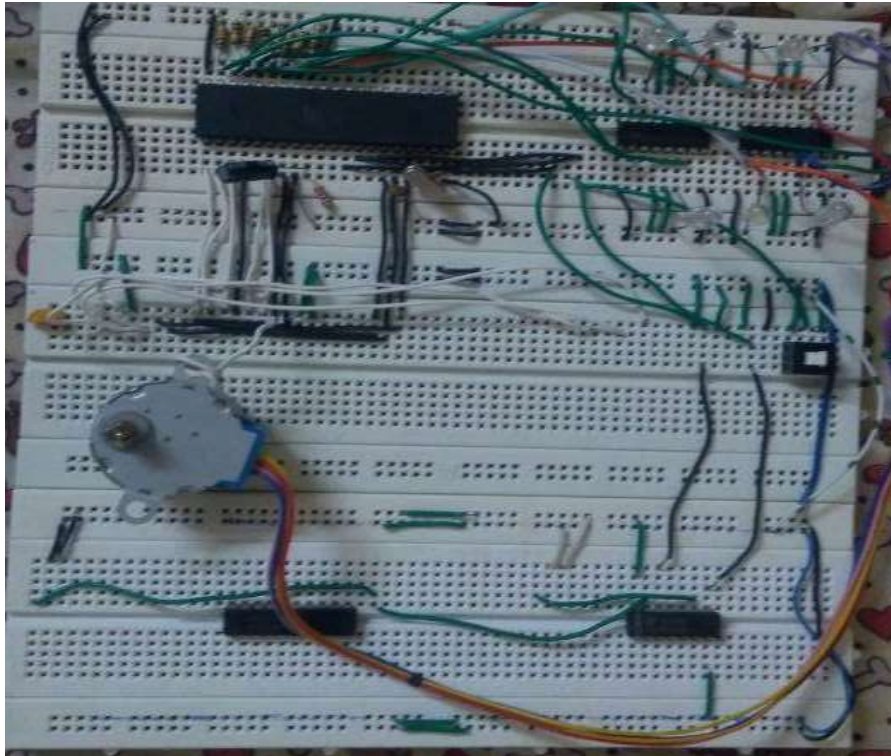
- **Libraries in KEIL:**

- 1) Stdio.h
- 2) Reg51.h

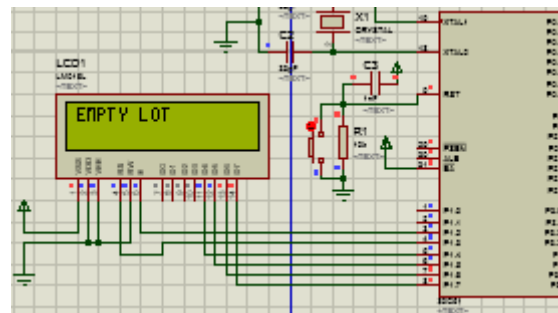
- **Project Completion:**

40-45% Done.

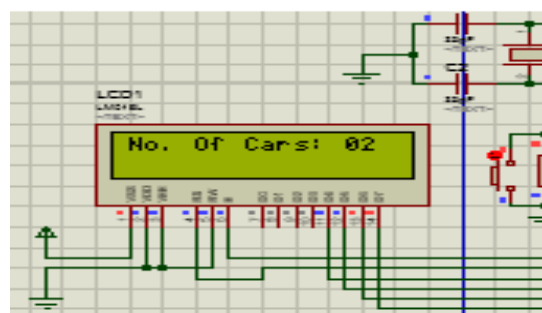
- 1) A roughly patched hardware with some free connections. Some IC's are yet to be purchased and not all the connections on the IC in the picture is completed.



- 2) When no Car is in the lot then the correct message is displayed.



- 3) The IR sensors do work well in the simulation, the motor will operate and after some delay the count goes up.



- 4) 2 entry sensors and 2 exit sensors added. 2 sensors for each so that we may detect the height of vehicle and operate the motor at appropriate angle according to it.

