uP & uC MTE PROJECT PRESENTATION

AUTOMATED TRAFFIC LIGHT CONTROLLER USING 8051 MICROCONTROLLER

REVIEW-1 PRESENTED BY

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2K18/EE/240 | 2K18/EE/250

BATCH: EE-4 | SEM: VI

Presented to: Prof. Anupama
Subject: Microprocessor & Microcontroller Applications (EE-306)
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Motivation

Traffic control is a big issue in today's era. Traffic jam is one of the major problems in a densely populated city like Delhi where its population and number of running vehicles are much more than its capacity. Faulty traffic signalling systems, inadequate manpower, narrow road spaces and overtaking tendency of drivers create pro-longed traffic jams. Due to traffic jam a substantial portion of working hours have to be left on streets which indirectly put adverse impact on economy and unavoidable road accident which results loss of lives. The number of vehicles is ever increasing while the city infrastructures are developing at a much slower rate.

Today's traffic control system can handle such a situation but not that much effectively because they are static in nature. We need a system which is dynamic in nature so that it can handle traffic smoothly and such a system is called **Automatic Traffic Control System**. In this project the simulation of automatic traffic light control systems will be presented on the proteus Software.
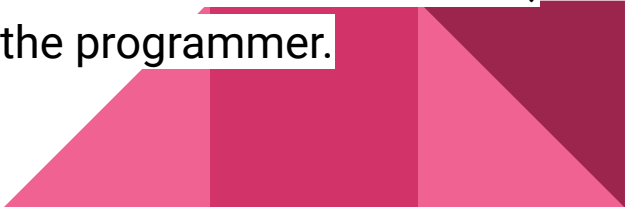
Let's Get Started!

About Our Project

Automated Traffic Light Control System.Here we are creating the same dynamic traffic control system which has the ability to control the traffic as well as avoid the congestion of roads. Here we are dealing with the traffic via IC. It will work in a way, it provides the instruction to the driver whether to drive through the intersection or yield at the intersection.

- **Objective:** The main aim of the project is to make an Efficient 4-way Automatic Traffic Light Controller using 8051 Microcontroller which will consist the following features:
  1. Signals for Traffic Management - Red, Yellow, Green lights.
  2. Signals for Pedestrian Crossing - Blue lights.
  3. 7-Segment (Common Anode) Display for time remaining information.

- **Project Type:** Circuit Simulation

- **Softwares Used:** Proteus 8.9 + MCU 8051 IDE

- **Microcontroller Used:** 8051

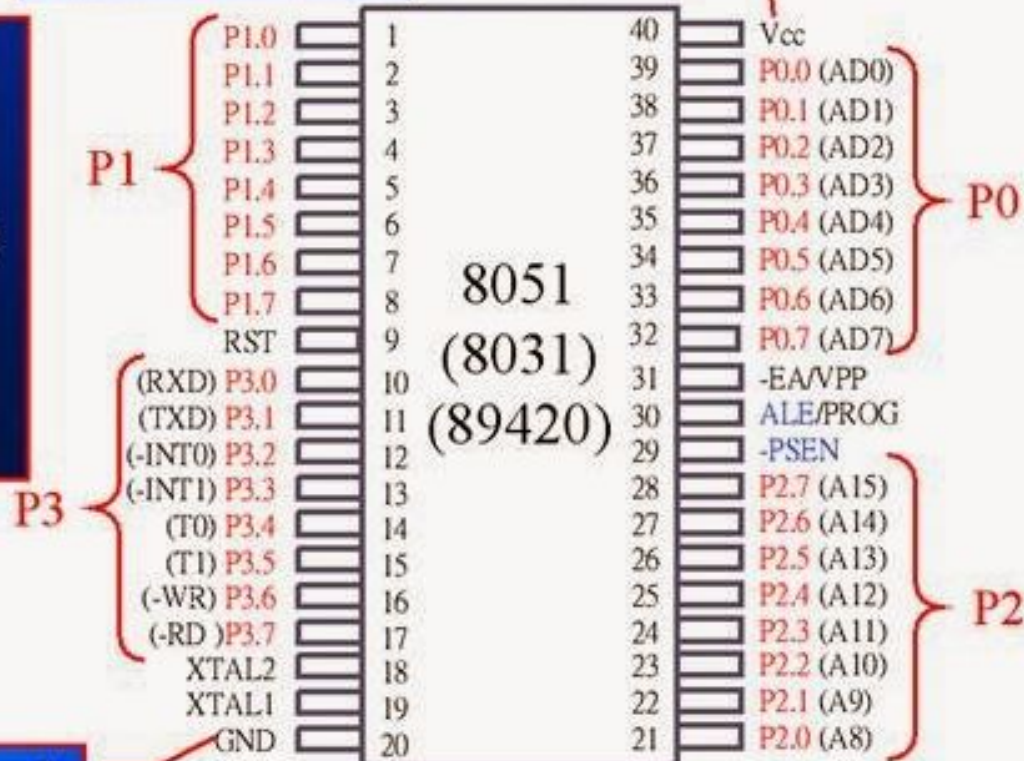- **Programming Language Used:** Assembly language (8051)

Microcontroller 8051

It is Very popular general purpose microcontroller. Widely used for small scale embedded systems. It was introduced by Intel in 1971.At that time it was known as System on Chip. This family is known as MCS 51 family. Other members are 8031 and 8052. 8031 is the cut down version of 8051 and 8052 is the enhanced version of 8051. Many vendors such as Atmel, Philips, and Texas Instruments produce MCS-51 family microcontroller chips. 8-bit microcontroller. It has 8 bit data bus and 16-bit address bus It has various Special Function Registers (SFR) such as the Accumulator, the B register, and many other control registers. 34 8-bit general purpose registers in total. The ALU performs one 8-bit operation at a time. It has 4 kB of ROM memory for storing the program code and 128 bytes of internal RAM for variables It has 16 bit timers , 32 I/O lines and 6 interrupt sources . The 8051 has 256 bytes of internal addressable RAM, although only first 128 bytes are available for general use by the programmer.

8051 Pin Diagram

Provides +5V supply voltage to the chip

A total of 32 pins are set aside for the four ports P0, P1, P2, P3, where each port takes 8 pins

|		8051 (8031) (89420)		
P1.0	1		40	Vcc
P1.1	2		39	P0.0 (AD0)
P1.2	3		38	P0.1 (AD1)
P1.3	4		37	P0.2 (AD2)
P1.4	5		36	P0.3 (AD3)
P1.5	6		35	P0.4 (AD4)
P1.6	7		34	P0.5 (AD5)
P1.7	8		33	P0.6 (AD6)
RST	9		32	P0.7 (AD7)
(RXD) P3.0	10		31	-EA/VPP
(TXD) P3.1	11		30	ALE/PROG
(-INT0) P3.2	12		29	-PSEN
(-INT1) P3.3	13		28	P2.7 (A15)
(T0) P3.4	14		27	P2.6 (A14)
(T1) P3.5	15		26	P2.5 (A13)
(-WR) P3.6	16		25	P2.4 (A12)
(-RD) P3.7	17		24	P2.3 (A11)
XTAL2	18		23	P2.2 (A10)
XTAL1	19		22	P2.1 (A9)
GND	20		21	P2.0 (A8)

P1

P3

P0

P2

Grond

Pins of 8051 Microcontroller

- Pins 1 to 8 − Port 1 - bi-directional I/O port.
- Pin 9 − It is a RESET pin, which is used to reset the microcontroller to its initial values.
- Pins 10 to 17 − These pins are known as Port 3. This port serves some functions like interrupts, timer input, control signals, serial communication signals RxD and TxD, etc.
- Pins 18 & 19 − These pins are used for interfacing an external crystal to get the system clock.
- Pin 20 − This pin provides the power supply to the circuit.
- Pins 21 to 28 − These pins are known as Port 2. It serves as I/O port. Higher order address bus signals are also multiplexed using this port.
- Pin 29 − This is PSEN pin which stands for Program Store Enable. It is used to read a signal from the external program memory.
- Pin 30 − This is EA pin which stands for External Access input. It is used to enable/disable the external memory interfacing.

  Pin 31 − This is ALE pin which stands for Address Latch Enable. It is used to demultiplex the address-data signal of port.

- Pins 32 to 39 − These pins are known as Port 0. It serves as I/O port. Lower order address and data bus signals are multiplexed using this port.
- Pin 40 − This pin is used to provide power supply to the circuit

Project Layout

Pedestrian traffic light

Vehicles Traffic light

R1

R2

R3

R4
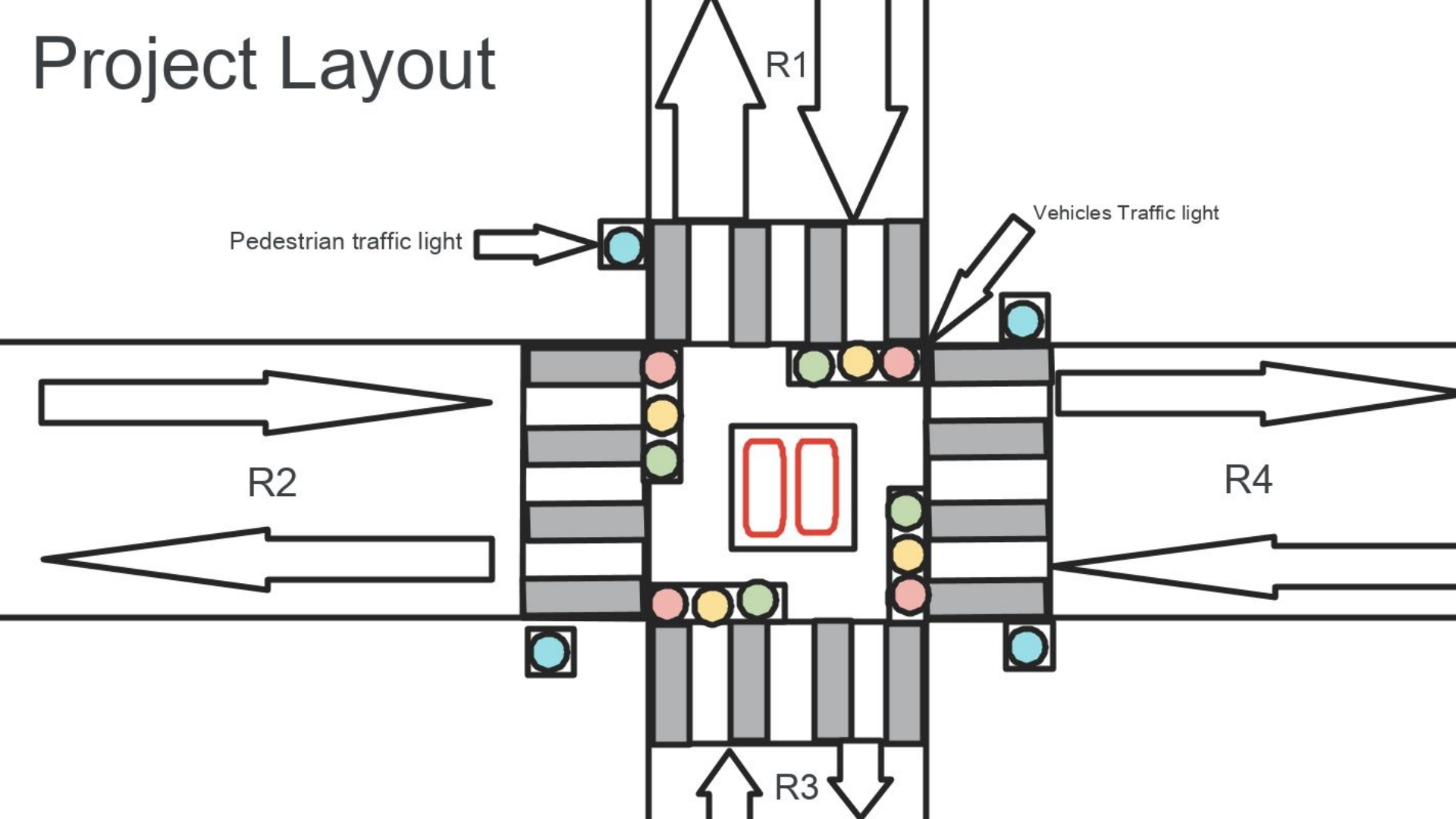
Next Review Highlights

- **Study 8051 and its programming in assembly language.**
- **Prepare Circuit Simulation in Proteus 8.9 software.**
- **Detailed Comprehensive Project Report.**

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THANK YOU