DENSITY BASED TRAFFIC CONTROL SYSTEM USING MICROCONTROLLER
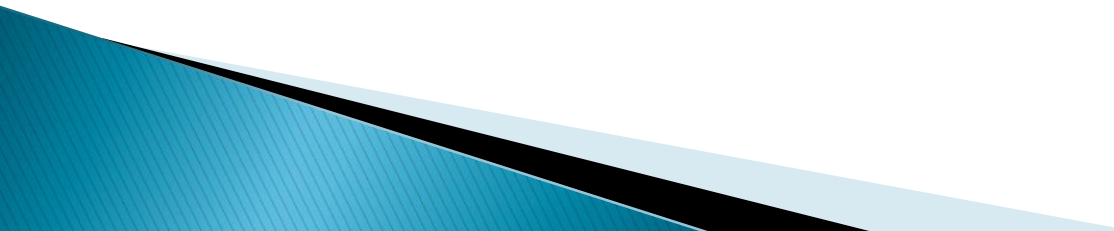
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AIM OF THE PROJECT

- Reducing traffic congestion.
- Reducing unwanted long time delay.
- It is designed to be implemented in places nearing the junctions .
- It keeps a track of the vehicles .
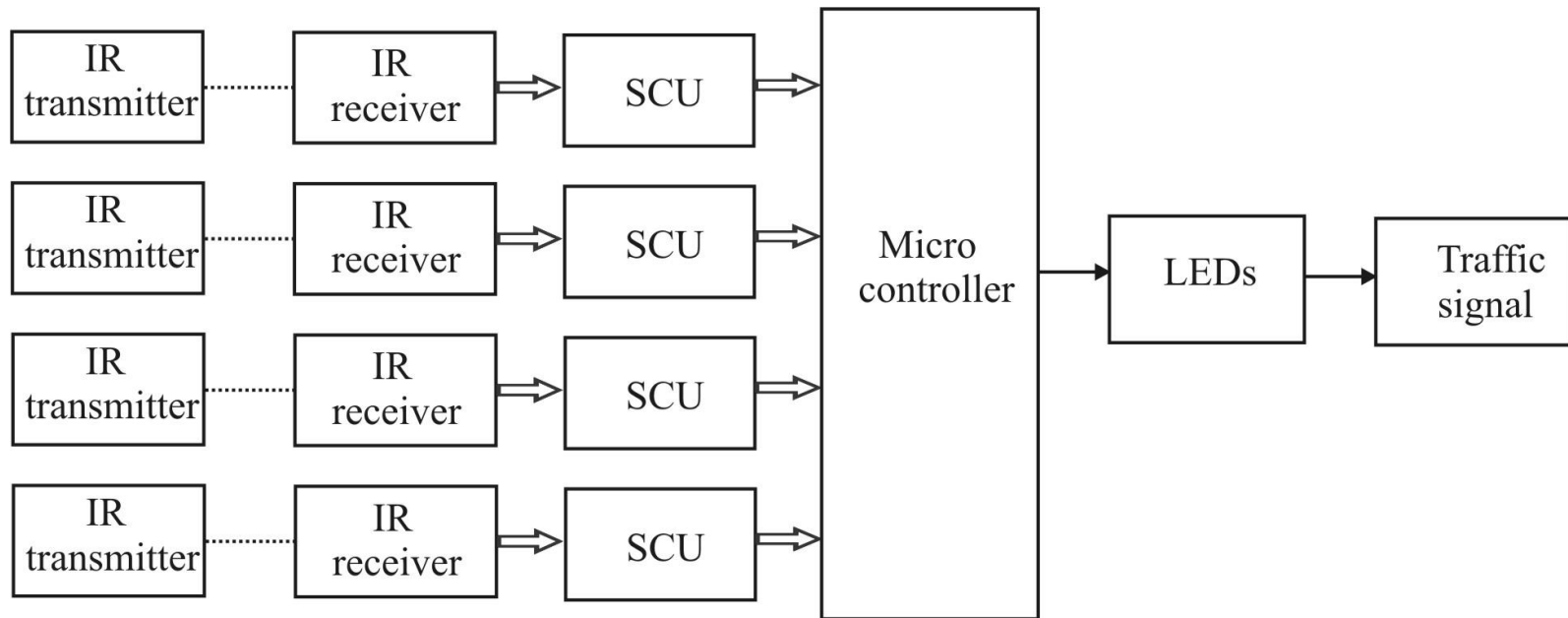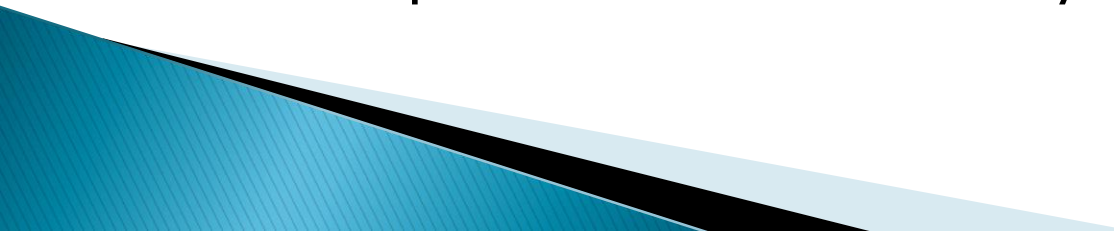- Need to develop the system without developing the infrastructure.
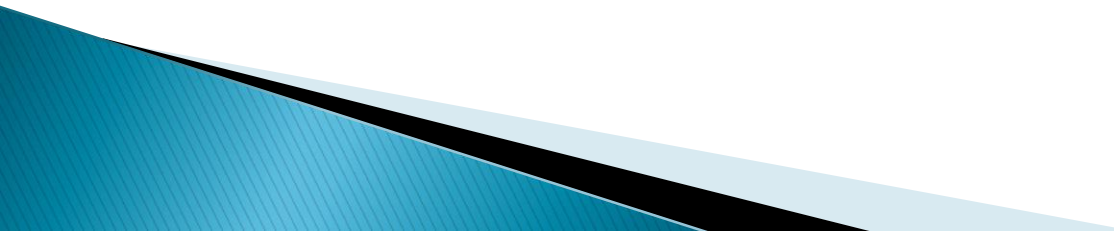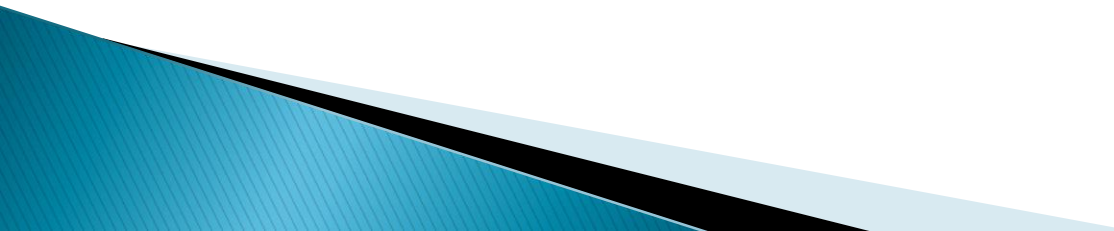
TRAFFIC DENSITY

BLOCK DIAGRAM

WORKING

➤ The IR sensor senses how many vehicles are crossing on the corresponding side. All the sensors send the corresponding output signal to microcontroller.

➤ The LCD display is used to indicate the side through which the vehicle has to be passed.

➤ The microcontroller compares which road side is the highest density (i e, more vehicles) and it delivers the corresponding signal to LED driver circuits. The LED driver circuit enables the LED to display for particular time depends on traffic density.
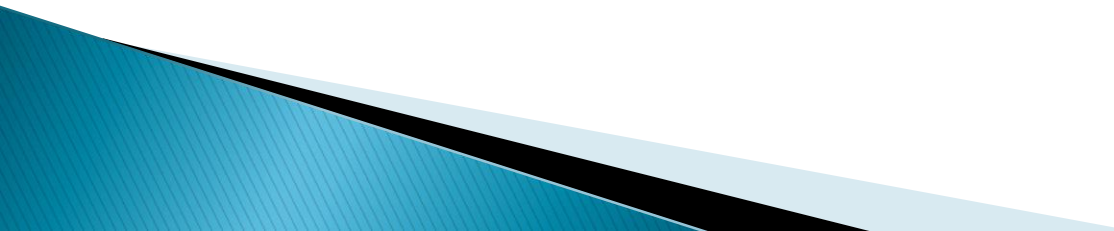
DESIGN COMPONENT

- Power supply unit
- Signal control unit
- ATMEL AT89C51microcontroller unit
- SMCL – LCD Liquid crystal display
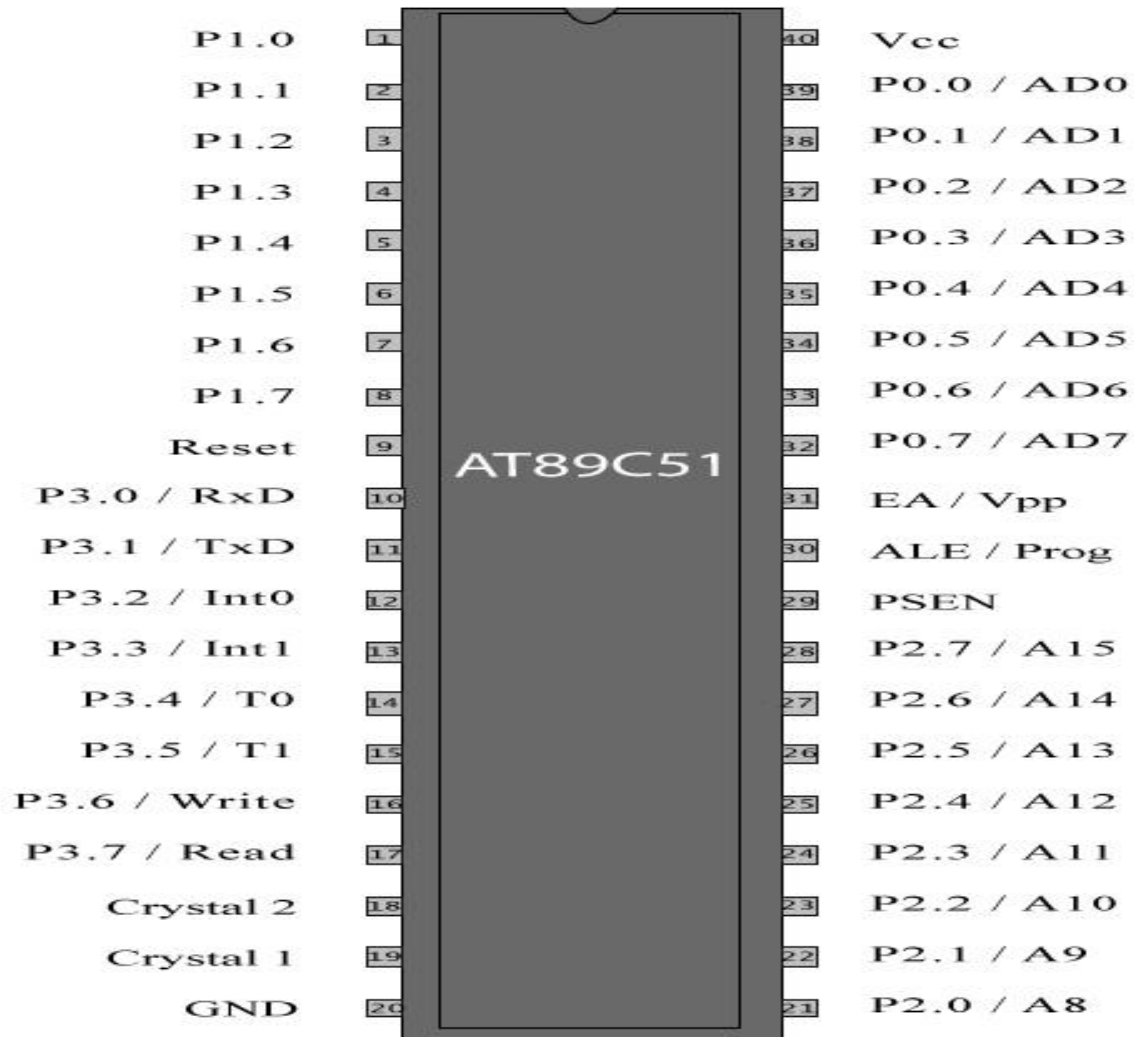- Infrared transmitter and reciver

Why microcontroller

- Single chip microprocessor system.
- The microcontroller contains full implementation of a standard. MICROPROCESSOR, ROM, RAM, I/0, CLOCK, TIMERS, and also SERIAL PORTS.
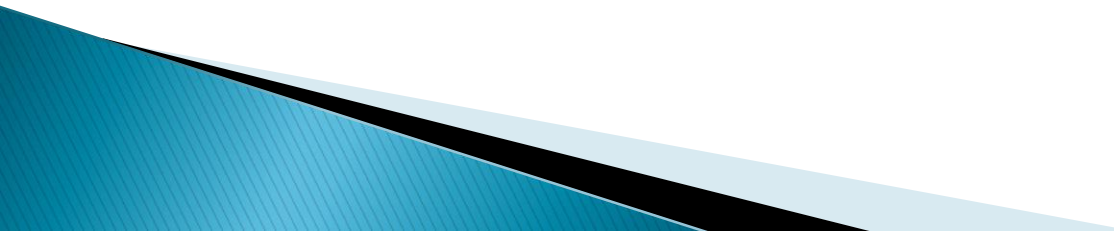- System as a low cost product.

WHY ATMEL 89C51 MC?

- 89c51 have RISC architecture and contains less no of opcodes which are easy for programming. so it is preferred than 8051.
- Flash EPROM
- Provided with memory not only RAM but also ROM.
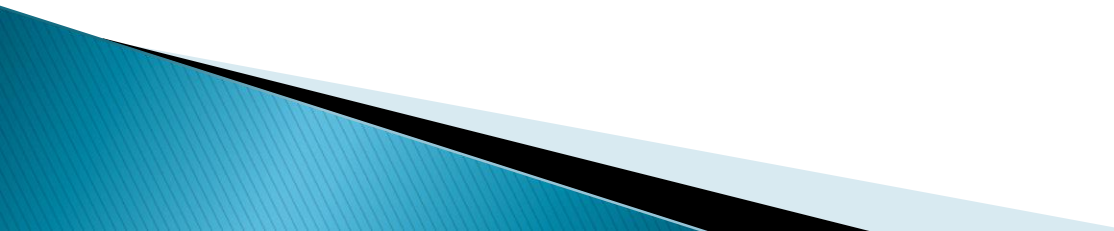- parallel and serial port (Universal Asynchronous Receiver/ Transmitter)

PIN DIAGRAM OF MICROCONTROLLER

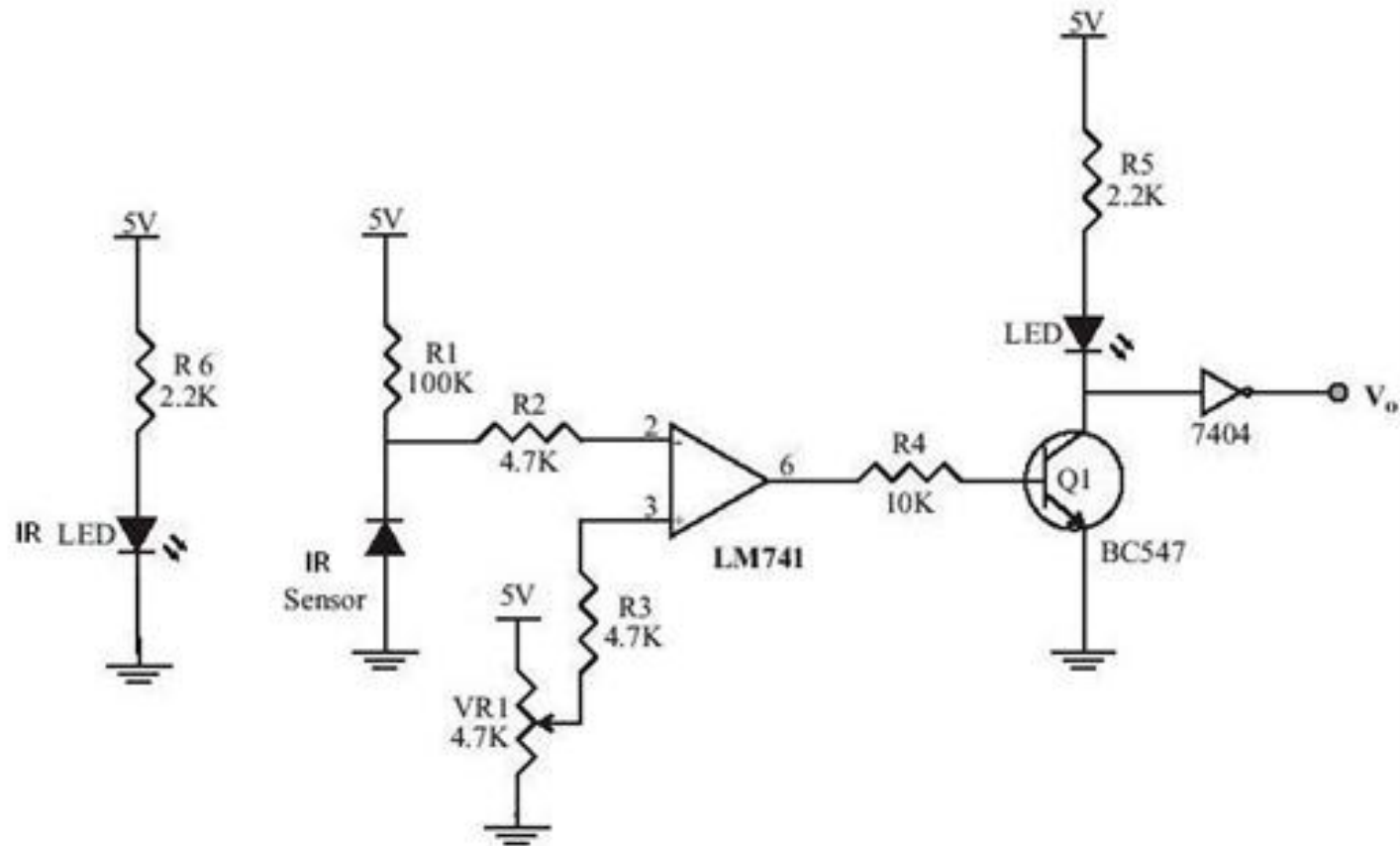|				
P1.0	1		40	Vcc
P1.1	2		39	P0.0 / AD0
P1.2	3		38	P0.1 / AD1
P1.3	4		37	P0.2 / AD2
P1.4	5		36	P0.3 / AD3
P1.5	6		35	P0.4 / AD4
P1.6	7		34	P0.5 / AD5
P1.7	8		33	P0.6 / AD6
Reset	9		32	P0.7 / AD7
P3.0 / RxD	10	AT89C51	31	EA / Vpp
P3.1 / TxD	11		30	ALE / Prog
P3.2 / Int0	12		29	PSEN
P3.3 / Int1	13		28	P2.7 / A15
P3.4 / T0	14		27	P2.6 / A14
P3.5 / T1	15		26	P2.5 / A13
P3.6 / Write	16		25	P2.4 / A12
P3.7 / Read	17		24	P2.3 / A11
Crystal 2	18		23	P2.2 / A10
Crystal 1	19		22	P2.1 / A9
GND	20		21	P2.0 / A8

IR TRANSMITTER

- Symbol and operation of IR transmitter is very similar to ordinary LED
- IR transmitter generates infrared. IR transmitter is made up of Gallium arsenide.
- If we pass the current to gallium arsenide it produces IR rays.
- Current applied to the sensor is directly proportional to the rays emitted
- though IR transmitter can withstand up to 35mA, we have used 5mA due to shortest distance.
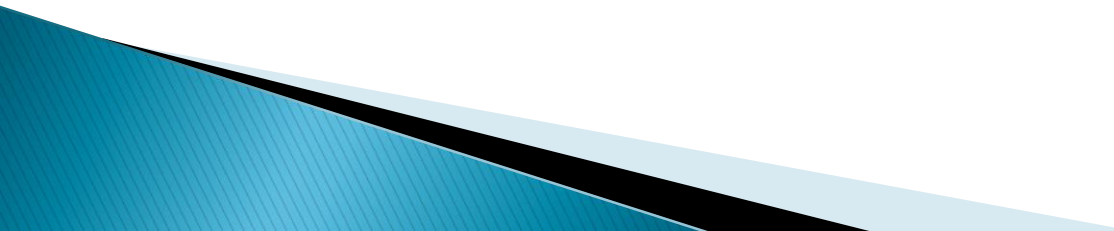- If the distance is more we have to increase the current flow to the transmitter

IR RECEIVER

- This circuit is mainly used to for counting application
- Since IR can be used only during proper alignment position
- IR receiver is having reverse characteristics of the IR transmitter
- IR Receiver will conduct as long as the rays falls on it.
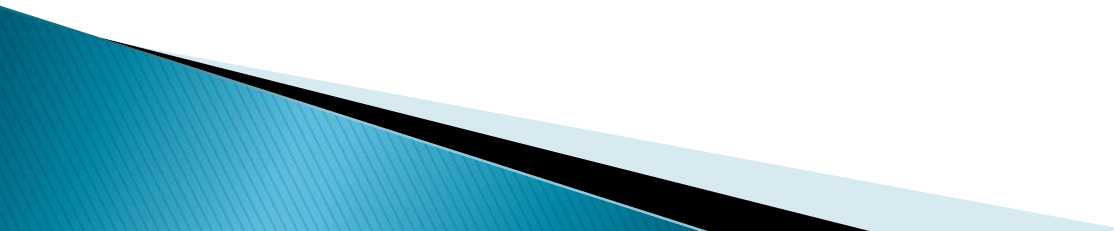
IR TRANSMITER AND RECIVER

ADVANTAGES OF INFRARED

➢ Electrical devices do not interfere with infra red transmission.

➢ Infra red technology are its simple and extremely cheap senders and receivers which are integrated into nearly all mobile devices

➢ No licenses are needed for infra red technology and shielding is very simple

➢ The transmission of infra red light (e.g., at 900 nm wavelength).
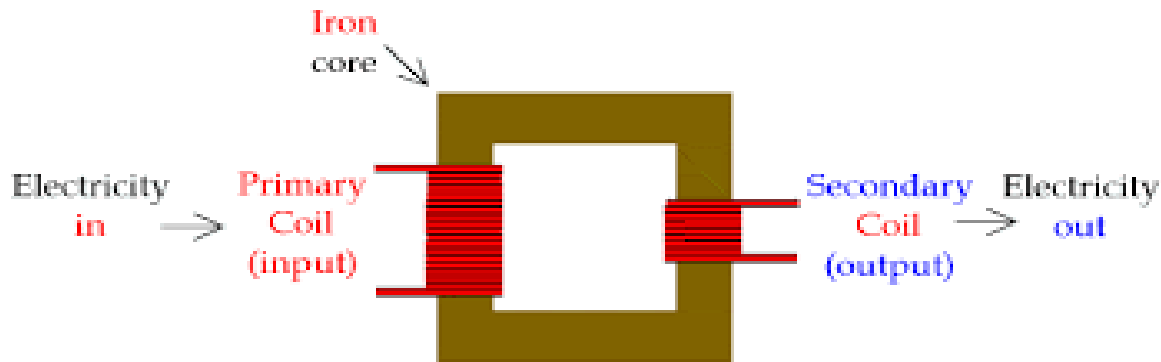
OVERALL CIRCUIT DIAGRAM

- [Click here](#)

POWER SUPPLY UNIT

- TRANSFORMER

- RECTIFIER

- FILTER

- IC REGULATOR

- LOAD

TRANSFORMER

- A voltage step-down transformer is used .
- It adjusts the Ac level so that the appropriate Dc amplitude is achieved.
- Its load handling capacity must be sufficient to supply the load and account for the losses in the rectifier, filter and regulator.
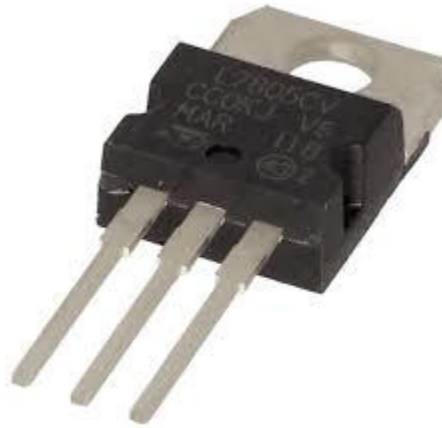
BRIDGE RECTIFER

- The circuit consists of four diodes (1N4007) in which at a time only two diodes conduct.
- Each diode has only transformer secondary voltage across it on the inverse cycle.
- This circuit model allows us to have the dc current to flow for the both cycles of Ac input.
- The bridge circuit is thus suitable for high voltage application.

FILTER

- The use of Filters is to smoothen the waveform by eliminating the ac components from the rectifier circuits .
- Basically capacitors are being connected in shunt.
- The action of the system occurs as the capacitor stores energy during the conduction period and delivers this energy to the load during non-conducting period .
- In this way, the time during which the current passes through the load is prolonged and the ripple is considerably decreased .

REGULATOR

- They maintain a constant voltage level independent of load condition or variation in the amplitude of the Ac supply .
- An example of regulator is LM78xx series It is the three terminal device with input .
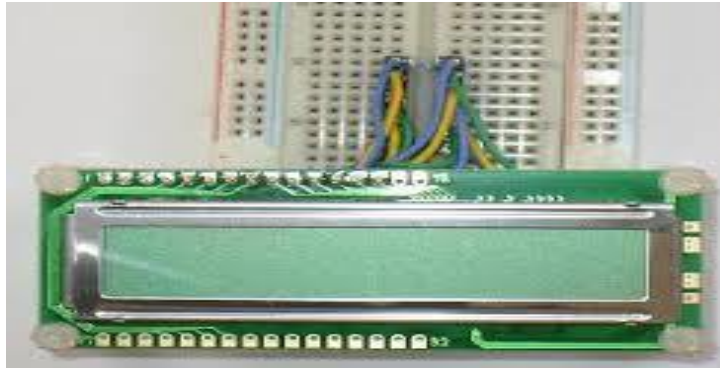- Hence LM7805 voltage regulator is used.

LED

▸ A light-emitting diode (LED) is a semiconductor light source. The color of the light is determined by the energy gap of the semiconductor.

LCD

- Liquid Crystal Display has 16 pins.
- First three and 15th pins are used for power supply.
- 4th pin is RS(Register Selection) if it is low data and if it is high command will be displayed.
- 5th pin is R/W if it is low it performs write operation.
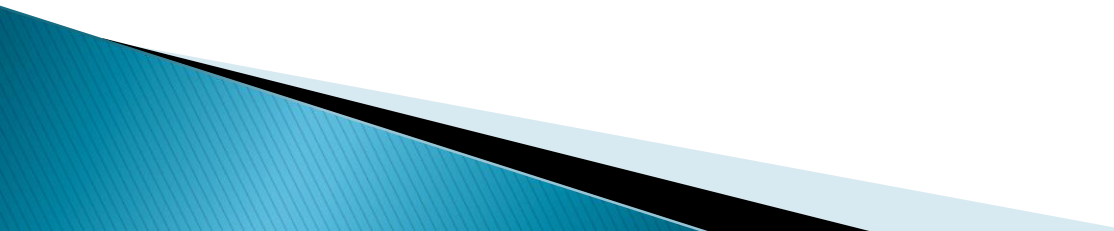- 6th pin act as enable and remaining pins are data lines.
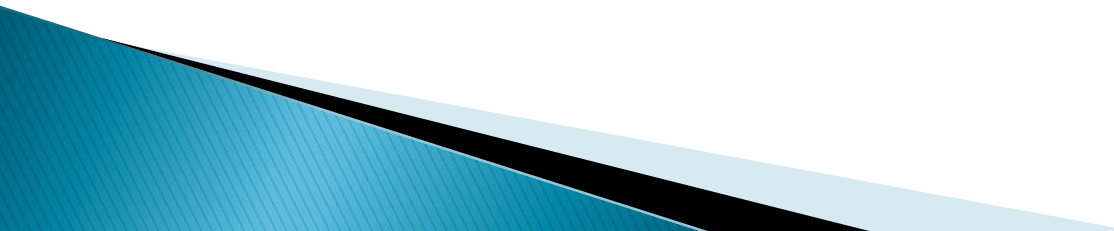
PROGRAM

- [CLICK HERE](#)

ADVANTAGES

- Avoids wastage of time due to the traffic

- Fully automatic

- Low power consumption

- It provides the easy access in the traffic light.

- Low cost to design the circuit, maintenance of the circuit is good

- By using this microcontroller IC we can create many more control to the appliances

- Easy convenience to handle

FUTURE SCOPE

- IR receiver module extended with automatic turn off when no vehicles are running on any side of the road which helps in power consumption saving.

- The system can be replaced by image processing system which will give efficient results .

CONCLUSION

▸ The project may be very well used in where the traffic signals is kept and in many other places where we need to full fill the need of the automation. In the future we implement the project's idea in the industries.

▸ By using this project in future we can know traffic density in the city and so that remedies can be made according to that.

THANK YOU