YCCE
Institute code : 4167
Yeshwantrao Chavan College of Engineering
(An Autonomous Institution Affiliation to Rashtrasant Tukadoji Maharaj Nagpur University)

Innovative Activity and PBL Activity

- **Subject :** Microcontroller and Interfacing (MCI)
- **Activity Name:** A) 8 LEDs Toggle Using 8051 Microcontroller
  B) Gas Leakage identification Using 8051uc
- **Branch**: Electronics And Telecommunication
- **Semester**: IV
- **Section**: C
- **Group Members** :

Sr.No.	Name	Roll No.	Registration No.
1.	Ram Bharat Bhadke	266	22030136
2.	Shravil Keshav Bhanarkar	269	22030175
3.	Shrikant Sanjay Sontakke	270	22030134

- **Aim-Part A) : 8 LEDs Toggle Using 8051 Microcontroller**

Components :

1) 8 LEDs
2) Breadboard
3) IC 89C52
4) Crystal 11.0592 MHz
5) Ceramic Capacitor 33PF
6) Resistors 220 ohm
7) Electrolytic Capacitor 10 uF
8) Voltage Regulator IC7805
9) 9V Power Supply, Connecting Wires

Working Principle :

The 8051 microcontroller is programmed to initialize the necessary I/O pins for controlling the LEDs. Each LED is connected to a specific I/O pin of the microcontroller.

The microcontroller sets these I/O pins as output pins, enabling it to control the state (ON/OFF) of each LED.

To toggle the LEDs, the microcontroller uses a loop that repeatedly switches the state of the LEDs. This can be achieved by using bitwise operations to manipulate the value of the data register associated with the I/O pins.

The initial state of the LEDs is determined based on the desired pattern or sequence. For example, all LEDs can be initially set to ON or OFF.

Within the loop, the microcontroller toggles the state of the LEDs by complementing the value of the data register. This effectively switches ON the LEDs that were initially OFF and vice versa.

The delay function is utilized to control the speed at which the LEDs toggle. By adjusting the delay duration, the LEDs can toggle at different rates, creating various visual effects.

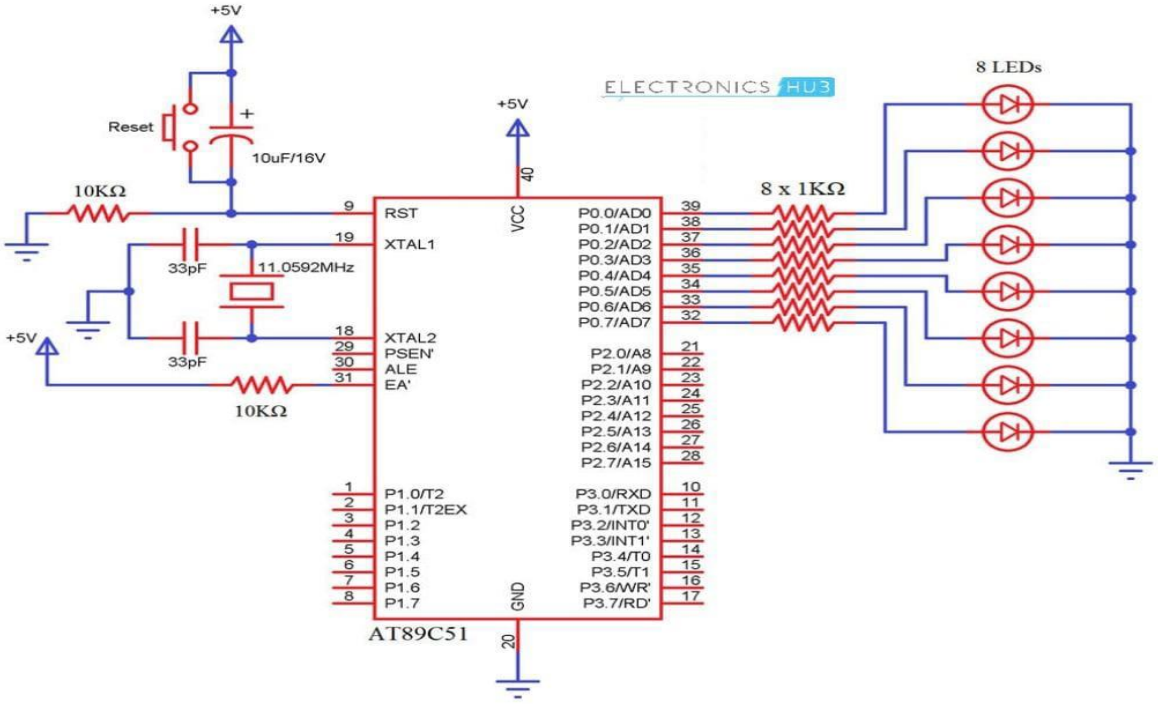
The loop continues indefinitely, ensuring that the LEDs continuously toggle according to the programmed pattern.

This process results in a visually appealing display where the LEDs appear to be flashing or toggling in a specific pattern.

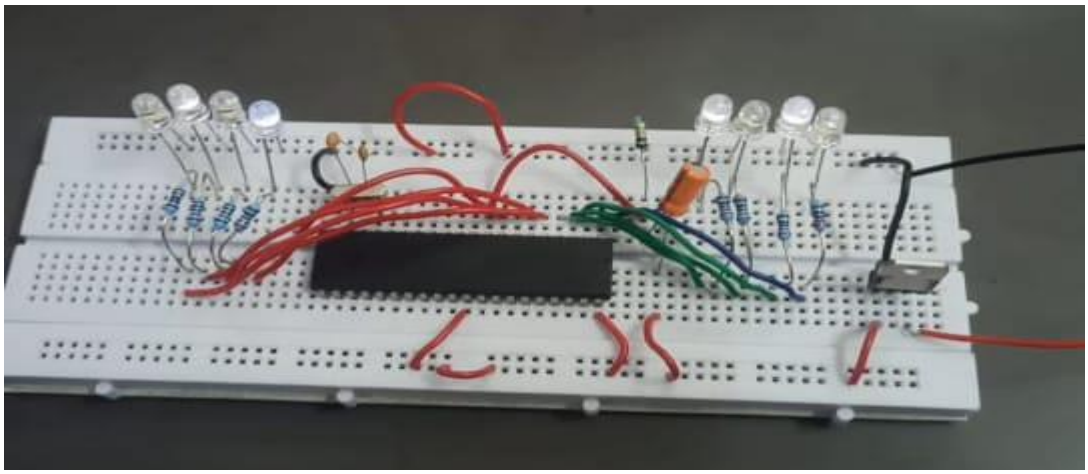
The 8051 microcontroller's capability to rapidly switch the state of the I/O pins allows for smooth and synchronized toggling of the LEDs.

By modifying the program and the pattern of toggling, different LED sequences and effects can be achieved, enabling creativity and customization in LED-based projects.

➢ Circuit Diagram :



- **Snapshot Of Activity :**



- **Program :**

```
#include<reg51.h>
void msdelay (unsigned int) ;
void main(void)
{
while(1)
{
p2=0×AA;
msdelay (150) ;
p2=0×55;
msdelay (150) ;
}
}
void msdelay (unsigned int x)
{
unsigned int i j;
for(i=0;i<x;I++)
{
for(j=0;j<1275;j++) ;
}
}
```

- **Aim-Part B) PBL Activity: Gas Leakage identification Using 8051uc**

- **Components :**
  1) Bread Board, Connecting Wires
  2) Resistors 220 ohm
  3) IC 89C52
  4) Gas Sensor
  5) Buzzer
  6) Crystal 11.0592 MHz
  7) 30PF Capacitors
  8) Resistors 10K ohm
  9) Capacitor 10uF, Voltage Regulator IC7805
  10) Power Supply

- **Working Principle :**

The gas sensor module, such as an MQ series gas sensor, is connected to an analog input pin of the 8051 microcontroller.

The gas sensor continuously detects the presence of gas in the environment and provides an analog voltage output proportional to the gas concentration.

The microcontroller reads the analog voltage from the gas sensor through the analog-to-digital converter (ADC) present in the microcontroller.

The ADC converts the analog voltage into a digital value that represents the gas concentration level.

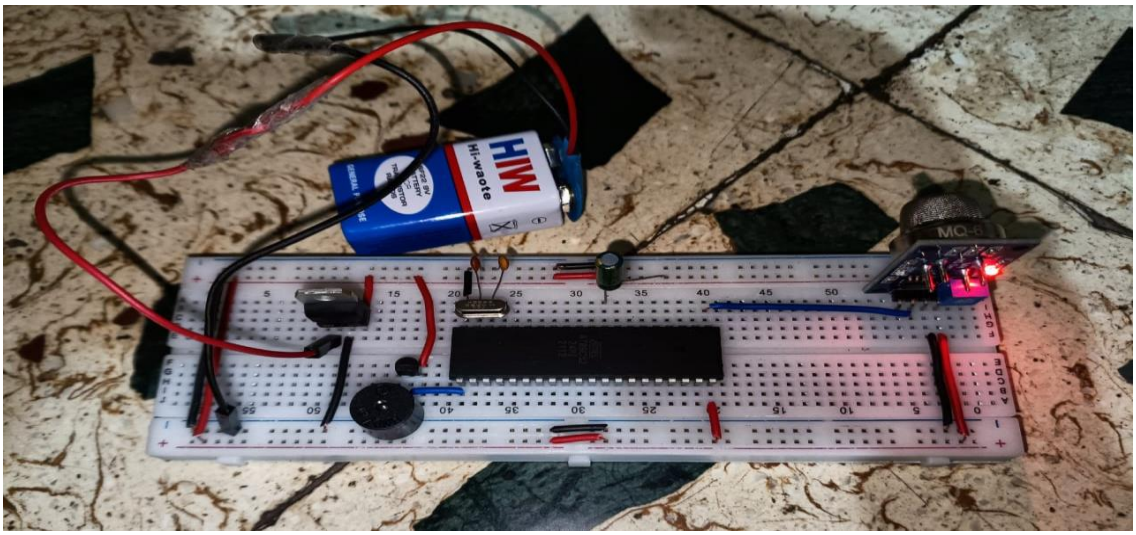
The microcontroller compares the digital value with a predefined threshold or reference level set in the program.

If the gas concentration exceeds the threshold, the microcontroller triggers an alarm or activates safety measures, such as closing valves, activating ventilation systems, or sending alerts.

The microcontroller continuously monitors the gas sensor output and takes appropriate actions based on the gas concentration level.

This gas leakage sensor system using the 8051 microcontroller ensures timely detection of gas leaks, facilitating prompt response and ensuring the safety of the environment and occupants.

- **Snapshot Of Project :**



- **Program :**

```
#include<reg51.h>
sbit sensor =P1^0;
sbit buzzer =P2^0;
void delay(unsigned int);
void main(void)
{
while(1)
{
P1=0xff;
P2=0x00;
if(sensor==0)
{
buzzer=1;
delay(1000);
buzzer=0;
delay(1000);
}
}
}
void delay(unsigned int x)
{
```

```
unsigned int i,j;
for(i=0;i<x;i++)
{
for(j=0;j<1275;j++);
}
}
```

- **Conclusion :**

  The Gas leakage sensor using the 8051 microcontroller is an effective and reliable solution for detecting gas leaks. The 8051 microcontroller provides precise and timely measurements, ensuring the safety of the environment and occupants. With its efficient design and advanced features, this sensor system can swiftly detect gas leaks, trigger alarms, and activate safety measures, preventing potential hazards and minimizing damage. Implementing this gas leakage sensor using the 8051 microcontroller is a cost-effective and practical solution for maintaining a secure and protected environment