

# **VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

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**Report on:**

**“MICROCONTROLLERS SOFTWARE PROJECT”**

**Submitted by:**

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# Visitor counter system design using 8051 microcontrollers.

## 1. INTRODUCTION:

- This system explains how to count the number of visitors entering and exiting the door. It senses and automatically switches ON and start counting and it is displayed on LCD (Liquid crystal display).
- Using this we can count and control the number of visitors.
- In here we are using buttons as sensors which will be present at both Entry and Exit doors.

## 1.1 DESCRIPTION:

Visitor counter system designed using 8051 micro- controller, AT89C51 micro-controller. Software developed using Embedded C Language in Keil IDE software and prototype simulated using Proteus simulation software.

## 1.2 ARCHITECTURE:



## **WORKING:**

**Theory:** Since it is the time of covid, the government has imposed a lot of restrictions for the safety of its public and so the only limited number of people are allowed to attend any ceremony, festivals or any kind of public gathering so this project helps us to control the number of people and helps them to follow rules and regulations and maintain public safety.

1. Initially, the LCD will be off when sensor 1 is triggered the **ENTRY** count is incremented indicating a person has entered.
2. when sensor 2 is triggered the **EXIT** count is incremented indicating a person has left the premises.
3. When the count reaches its maximum value (maximum is set to 100 initially) the counter stops.

## **1.3 SOFTWARE USED TOOLS**

### **1. Keil software:**

- Keil provides a broad range of development tools like ANSI C compiler, macro assemblers, debuggers and simulators, linkers, IDE, library managers, real-time operating systems (currently RTX5) and evaluation boards for over 8,500 devices.

### **2. Proteus software.**

- The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation.

## 1.4 DESCRIPTION OF COMPONENTS

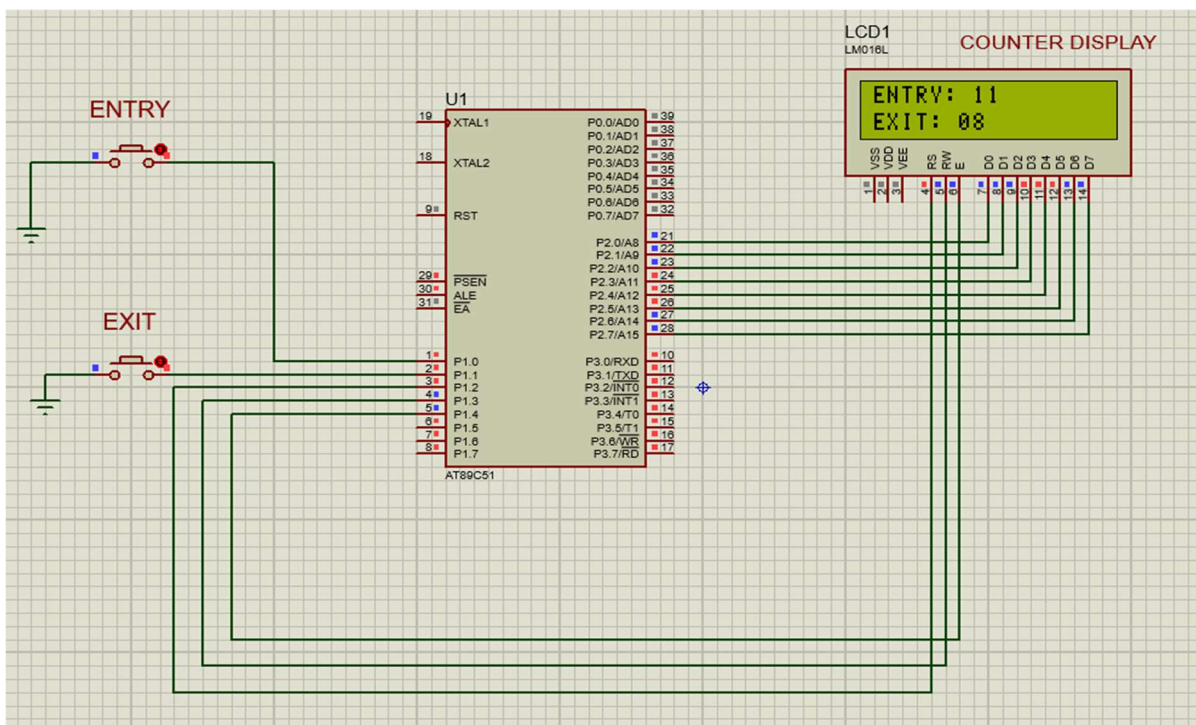
- **8051 Microcontroller:** The 8051 is an 8-bit microcontroller with 8bit data bus and 16-bit address bus. The 16bit address bus can address a 64K (2<sup>16</sup>) byte code memory space and a separate 64K byte of data memory space. The 8051 has 4K on-chip read only code memory and 128 bytes of internal RAM.
- **LCD:**
  - LCD (Liquid Crystal Display) screen is an electronic display module. 16x2 LCD means it can display 16 characters per line and there are 2 such lines.
  - In this LCD each character is displayed in 5x7 pixel matrix.
  - This LCD has two registers namely,
    1. Command
    2. Data
- **BUTTON:**
  - A push-button (also spelled pushbutton) or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal.

## 2. IMPLEMENTATION AND RESULTS:

### 2.1 ALGORITHM:

- First configure the sensors and LCD control lines.
- Then initialise LCD.
- Initial values of both entry & exit are zero.
- If sensor 1 is triggered increment Entry by one.
- If sensor 2 is triggered increment Exit by one.
- Convert the output hexadecimal into decimal.
- Show the output in LCD.
- End.

### 2.2 IMPLEMENTED PROJECT



### 3. CONCLUSION:

- Since it is the time of covid, the government has imposed a lot of restrictions for the safety of its public and so the only limited number of people are allowed to attend any ceremony, festivals or any kind of public gathering so this project helps us to control the number of people and helps them to follow rules and regulations and maintain public safety.

### 4. REFERENCE:

[1] URL: <https://youtu.be/Q17bYZoPjYk>

### 5. APPENDIX:

```
#include<reg51.h>

sbit sen1=P1^0;
sbit sen2=P1^1;
sbit rs=P1^2;
sbit rw=P1^3;
sbit en=P1^4;

void lcdcmd(unsigned char);
void lcdat(unsigned char);
void delay();
void lcdis(unsigned char *s, unsigned char r);
void lcdconv(unsigned char);
```

```
void main()
{
    unsigned char x,y;
    lcdcmd(0x38);
    delay();
    lcdcmd(0x01);
    delay();
    lcdcmd(0x10);
    delay();
    lcdcmd(0x0c);
    delay();
    lcdis("WELCOME",7);
    lcdcmd(0xc0);
    delay();
    delay();
    delay();
    delay();
    delay();
    delay();
    delay();
    lcdis("VISITOR COUNTER",15);
    delay();
    delay();
    delay();
    delay();
    delay();
    delay();
    delay();
}
```

```

    lcdcmd(0x01);
    delay();

    while(1)
    {
        if(sen1==0)
        {
            lcdcmd(0x80);
            delay();
            lcdcmd(0x87);
            delay();
            x=x+1;
            lcdconv(x);
        }
        if(sen2==0)
        {
            lcdcmd(0xc0);
            lcdcmd(0xc6);
            delay();
            y=y+1;
            lcdconv(y);
            delay();
        }
    }
}

```



```
void lcdcmd(unsigned char val)
```

```
{  
    P2=val;  
    rs=0;  
    rw=0;  
    en=1;  
    delay();  
    en=0;  
}
```

```
void lcddat(unsigned char dat)
```

```
{  
    P2=dat;  
    rs=1;  
    rw=0;  
    en=1;  
    delay();  
    en=0;  
}
```

```
void lcddis(unsigned char *s, unsigned char r)
```

```
{  
    unsigned char w;  
    for(w=0;w<r;w++)  
    {  
        lcddat(s[w]);  
        delay();  
    }  
}
```

```
void lcdconv(unsigned char num)
{
    unsigned char p,n;
    p=num/10;
    n=num%10;
    p=p+0x30;
    n=n+0x30;
    lcddat(p);
    lcddat(n);
}
void delay()
{
    unsigned int k,l;
    for(k=0;k<1000;k++);
    for(l=0;l<100;l++);
}
```

**DATE OF SUBMISSION:** 14/08/2021

**WHETHER VIDEO OF FUNCTIONAL PROTOTYPE IS SUBMITTED ALONG WITH THIS DOCUMENT**

**YES** ☐

**NO** ☒

A handwritten signature in black ink, appearing to be 'Varun B M', with a large loop and a cross-like stroke.

**VARUN B M**