Project: Count number of times switch pressed and display count number on LCD.

LCD data pins are connected to Port 0 and control pins to Port 2.0 to 2.2 .
Switch is connected to Port 3.4 (counter 0 pin).

You can't display two digits or more directly on LCD. Suppose number is 15, then 1st you have to send 1 and then 5 to LCD. We know that while sending numbers to LCD, we have to send it in ASCII format.
ASCII value of 0 is 0x30,
ASCII value of 1 is 0x31
and similarly ASCII value of 9 is 0x39
Hence if you want to display 1 you have to send (1 + 0x30) i.e 0x31 to LCD and then to display 5, you have to send (5 + 0x30) i.e 0x35 to LCD.
Now somehow we have to segregate digits 1 and 5 from number 15.

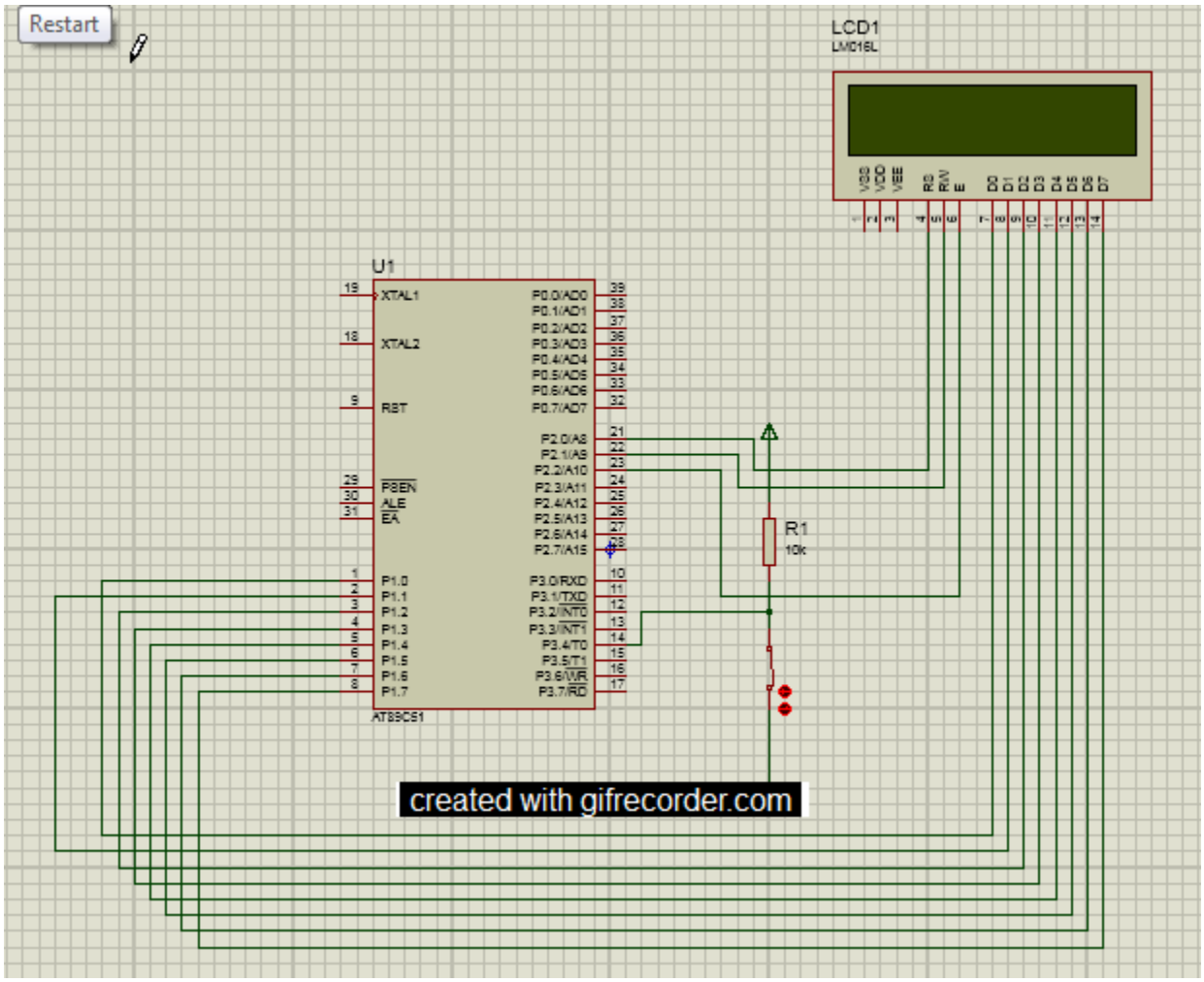
Here is the logic.
Let's say you have collected number in **cnt_val** variable of type **unsigned int** and **i** is temporary variable of type **unsigned char**.
cnt_val = 15;

To get the Ten's place digit you have to divide number by 10. Here in our case 15/10 result in 1 as quotient
i = cnt_val/10; // i= 1

now to convert digit into ASCII add 0x30 i.e (i + 0x30) and then send it to LCD as a data.
send_data(i + 0x30); // send_data(0x31) // Displayed number on LCD is 1

To get the unit place digit you have to take mod 10 of number. Here in our case 15%10 result in 5 as remainder. MOD operation gives you remainder.
i = cnt_val%10 ; // i= 5

now to convert digit into ASCII add 0x30 i.e (i + 0x30) and then send it to LCD as a data.
send_data(i + 0x30); // send_data(0x35) // Displayed number on LCD is 5



Copy the following code and run step by step.

```
#include<reg52.h>

sbit count_T0=P3^4;

sbit RS=P2^0;
sbit RW=P2^1;
sbit E=P2^2;

void send_command(unsigned int command_value ) ;
void send_data(unsigned int data_value) ;
void ms_delay( unsigned int time);
unsigned char i;
unsigned int cnt_val;
```

```
void main()
{

//LCD INITIALIZATION

//2 lines and 5x7 matrix
send_command(0x38);

//display on cursor blink
send_command(0x0E);

//clear display screen
send_command(0X01);

// counter initialization
TMOD=0X06; //counter 0, mode 2, 8 bit mode
count_T0=1; // p3.4 input pin

while(1)
{

TH0=0x00;
TL0=0x00;          // count value initialize

TR0=1; //counter 0 on

while(!TF0) // monitoring TF0 flag
{
          send_command(0x80)   ; // force cursor on 1st line and 1st col

          cnt_val = TL0;

          i = cnt_val/10; //Get the Ten's place
 //        i + 0x30;                          // Convert it to ASCII
 send_data(i + 0x30);                        //Display Tens place

          i = cnt_val%10 ;                   //Get the unit place
 //        i + 0x30;                          // Convert it to ASCII
 send_data(i + 0x30);    //Display unit place

          if (cnt_val == 100)   // restricting count 00 to 99
          {
                    break;
          }
}

TF0=0;  //reset flag
```

```
TR0=0; //off counter
}

}



void send_command(unsigned int command_value ) //send command to LCD
{
        P1=command_value;
        RW=0;
        RS=0;
        E=1;
        ms_delay(10);
        E=0;
}

void send_data(unsigned int data_value) // send data to LCD
{
        P1=data_value;
        RW=0;
        RS=1;
        E=1;
        ms_delay(10);
        E=0;
}

void ms_delay( unsigned int time)   // delay generation
{
        unsigned int i,j;
        //time X 1ms
        for(i=0;i<time;i++)
        {
                for(j=0;j<113;j++);  //1 ms
        }
}
```