```
#define _XTAL_FREQ 20000000
#define Baud_rate 9600
// DEFINING LCD PINS
#define RS RB0
#define EN RB1
#define D4 RB2
#define D5 RB3
#define D6 RB4
#define D7 RB5
#include <xc.h>

#include "LCD16.h"// HEADER FILE TO USE LCD

void Initialize_UART(void)
{
   /**Setting I/O pins for UART*/
   TRISC6 = 0; // TX Pin set as output
   TRISC7 = 1; // RX Pin set as input



   SPBRG = ((_XTAL_FREQ/16)/Baud_rate) - 1;
   BRGH  = 1;  // for high baud_rate



   SYNC  = 0;    // Asynchronous
   SPEN  = 1;    // Enable serial port pins
```

```
   TXEN  = 1;    // enable transmission
   CREN  = 1;    // enable reception




   TX9   = 0;    // 8-bit reception selected
   RX9   = 0;    // 8-bit reception mode selected

}

char UART_get_char()
{

if (PIR1bits.RCIF==1){  // IF DATA IS AVAILABLE
   if(OERR)
   {
      CREN = 0;
      CREN = 1;
   }




   return RCREG; //receive the value and send it to main function


   }}
void delay(){                 //DELAY FUNCTION
   for (int i=0;i<700;i++){
      for (int z=0;z<1000;z++){
   }
```

```
   }}
void lcdhome(void){   //LCD FUNCTION FOR STATUS DISPLAY
   Lcd_Clear();
      Lcd_Set_Cursor(1,1);
   Lcd_Print_String("L1 L2 L3 L4 L5");
   if (RD0==0){
       Lcd_Set_Cursor(2,1);
       Lcd_Print_String("OFF");
   }
   else if(RD0==1)
   {

      Lcd_Set_Cursor(2,1);
       Lcd_Print_String("ON ");
   }
    if (RD1==0){
       Lcd_Set_Cursor(2,4);
       Lcd_Print_String("OFF");
   }
   else if(RD1==1)
   {

      Lcd_Set_Cursor(2,4);
       Lcd_Print_String("ON ");
   }
    if (RD2==0){
       Lcd_Set_Cursor(2,7);
       Lcd_Print_String("OFF");
   }
```

```
else if(RD2==1)
{

   Lcd_Set_Cursor(2,7);
    Lcd_Print_String("ON ");
}
 if (RD3==0){
    Lcd_Set_Cursor(2,10);
    Lcd_Print_String("OFF");
}
else if(RD3==1)
{

   Lcd_Set_Cursor(2,10);
    Lcd_Print_String("ON ");
}
 if (RD4==0){
    Lcd_Set_Cursor(2,13);
    Lcd_Print_String("OFF");
}
else if(RD4==1)
{

   Lcd_Set_Cursor(2,13);
    Lcd_Print_String("ON ");
}
delay();
Lcd_Set_Cursor(1,1);
Lcd_Print_String("L6 L7 L8 L9 L10");
```

```
 if (RD5==0){
    Lcd_Set_Cursor(2,1);
    Lcd_Print_String("OFF");
}
else if(RD5==1)
{

   Lcd_Set_Cursor(2,1);
    Lcd_Print_String("ON ");
}
    if (RD6==0){
    Lcd_Set_Cursor(2,4);
    Lcd_Print_String("OFF");
}
else if(RD6==1)
{

   Lcd_Set_Cursor(2,4);
    Lcd_Print_String("ON ");
}
  if (RD7==0){
    Lcd_Set_Cursor(2,7);
    Lcd_Print_String("OFF");
}
else if(RD7==1)
{

   Lcd_Set_Cursor(2,7);
    Lcd_Print_String("ON ");
```

```
    }
        if (RC1==0){
        Lcd_Set_Cursor(2,10);
        Lcd_Print_String("OFF");
    }
    else if(RC1==1)
    {

       Lcd_Set_Cursor(2,10);
        Lcd_Print_String("ON ");
    }
        if (RC2==0){
        Lcd_Set_Cursor(2,13);
        Lcd_Print_String("OFF");
    }
    else if(RC2==1)
    {

       Lcd_Set_Cursor(2,13);
        Lcd_Print_String("ON ");
    }
    delay();
    return;
}
int main()
{


    unsigned int a;
```

```
 TRISB = 0x00; // INITIALIZING PORT B AS OUTPUT PORT
 TRISC=0x00;      // INITIALIZING PORT C AS OUTPUT PORT
   RC1=0;//INITIALIZING PIN AS OUTPUT
RC2=0;

 Lcd_Start();
    Lcd_Clear();
    Lcd_Set_Cursor(1,1);
     Lcd_Print_String("HOME AUTOMATION");
    int get_value;
    TRISD=0x00;// INITIALIZING PORT D AS OUTPUT PORT
    PORTD=0x00;


 Initialize_UART();    //Initialize UART module



 while(1) //Infinite loop
 {

     lcdhome();


   get_value= UART_get_char();
       /** COMPAIRING VALUE RECIEVED FROM SERIAL WITH OUR DESIRED INPUT AND THEN
CHANGING STATUS OF
        RESPECTIVE */
    if (get_value == '1')
    {
```

```
   RD0=!RD0;  //TOGGLING ON/OFF ACCORDING TO INPUT
   lcdhome();//CALLING FUNCTION TO DISPLAY CHANGE IN STATUS ON LCD
  }

else if (get_value == '2')
  {
   RD1=!RD1;
   lcdhome();
  }

  else if (get_value == '3')
  {
   RD2=!RD2;
   lcdhome();
  }
   else if (get_value == '4')
  {
   RD3=!RD3;
   lcdhome();
  }
   else if (get_value == '5')
  {
   RD4=!RD4;
   lcdhome();
  }
   else if (get_value == '6')
  {
   RD5=!RD5;
   lcdhome();
```

```
        }
         else if (get_value == '7')
        {
          RD6=!RD6;
          lcdhome();
        }
         else if (get_value == '8')
        {
          RD7=!RD7;
          lcdhome();
        }
         else if (get_value == '9')
        {
          RC1=!RC1;
          lcdhome();
        }
         else if (get_value == '0')
        {
          RC2=!RC2;
          lcdhome();
        }
    }

}
```