Task no 7

Microprocessor Based System Design

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Submitted by

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Code: -

```
#include <reg51.h>
#define input P1;
double newtemp;
char result_char;
int x=0;

  //LCD pins
sbit rs = P3^7;       //register select pin
sbit e = P3^6;       //enable pin

//ADC pins
sbit rd=P3^4;              //defines rd pin of ADC use for reading purposes
sbit wr=P3^5;                       // define wr pin of ADC use for writing purposes
sbit intr=P3^2;                     //defines intr pin use for sending interrupts
sbit buz=P3^0;                      //used for buzzer on off

//functions
void reg_no_print();
void delay(unsigned int time);    //Function to provide time delay in msec.
double adc();                                        // Function to read the values from ADC and
send to controller.
void writecmd(unsigned char item);    //Function to send commands to LCD see
command tables in LCD Link
void writedata(double item);                     //Function to send data to LCD
void disp_temp(double num);           //displays number on LCD
void read();                                   // Displays "READING" while controller reads from
ADC
void timer_init();

void timer0(void) interrupt 1{
//Interupt service routine

x++;
if(x==1){
        buz=1;

}
else if(x==7){
```

```
         buz=0;

}
else if (x== 10)
{
   x=0;
   TR0=0; //timer stop
}
TH0=0xFE; //for delay
 TL0=0x0C;
}

void main()
{
  P0=0x00;                              //intialize port 0
  timer_init();         //initialize the timer
  while(1)
   {                            //enters in the permanent loop
     buz=1;
     reg_no_print();      //print reg_no
     read();
     newtemp=adc();                    //reads first value  from ADC
     disp_temp(newtemp);          //show temperature
     if(newtemp>25.0 || newtemp<10.0)
     {
     TR0=1; //timer run
     buz=0;
     while(TR0==1);
     buz=1;
     }
     else
     {
buz=1;
TR0=0;
     }
     delay(300);
}
}
void delay(unsigned int time)    //Function to provide time delay in msec.
```

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

double adc()  // Function to read the values from ADC and send to controller.
{
  double temp;
  rd=1;   //high to low  to read from adc
  wr=0;   //low to high to write on adc
  delay(1);
  wr=1;
  while(intr==1); //interrupt is low active
  rd=0;
  temp=input;  //getting the converted digital value
  delay(3);
  return temp;
}

void writecmd(unsigned char item)
{
  P2 = item; //Data transfer to P2
  rs= 0;            // This is for command
  e=1;
  delay(1);
  e=0;
  delay(1);
}

void writedata(double item)    //Function to send data to LCD
{
  P2 = item;
  rs= 1;           // This is for data
  e=1;
  delay(1);
  e=0;
}

void disp_temp(double num)           //displays number on LCD
```

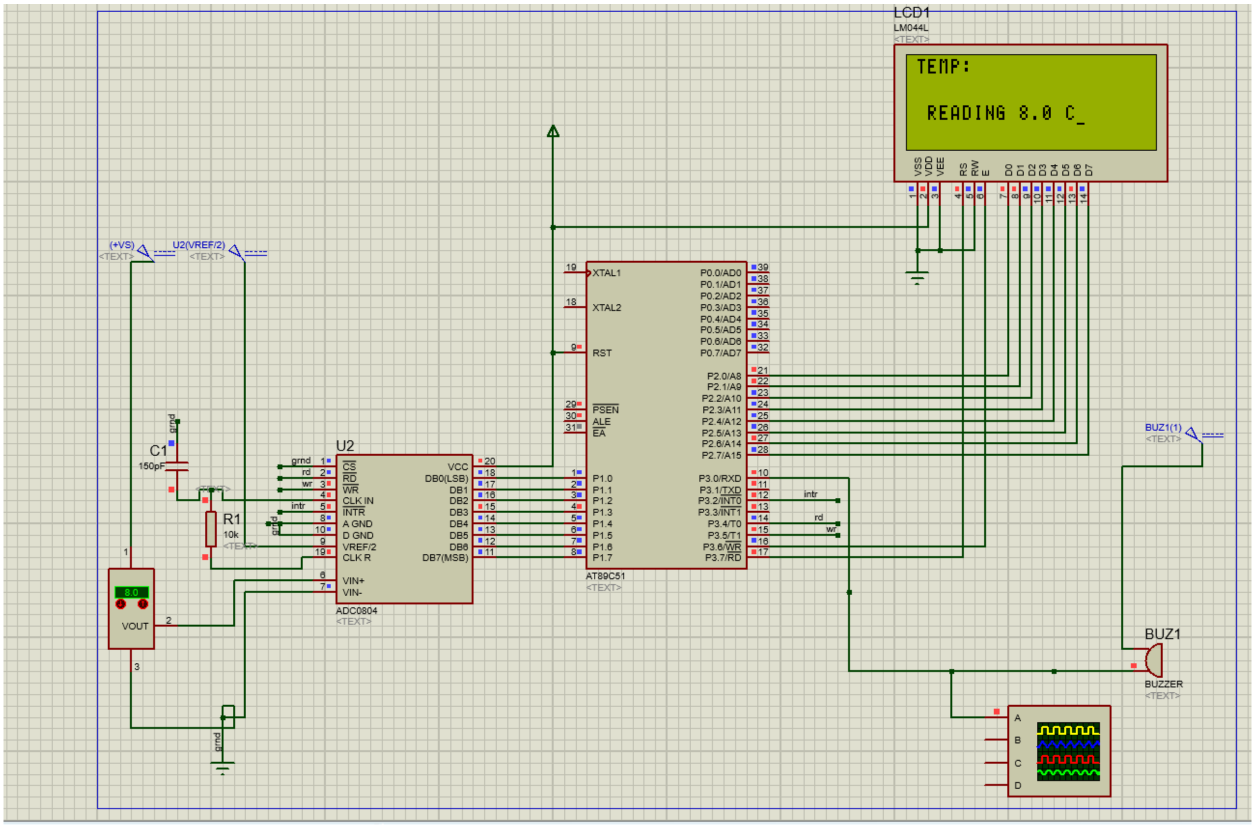
```
{
  unsigned char UnitDigit  = 0;
  unsigned char TenthDigit = 0;
  unsigned char HundDigit = 0;
  unsigned char decimal=0;
  int point;
  point=num*10;
  HundDigit=(num/100);
  if( HundDigit != 0)
  writedata(HundDigit+0x30);
  TenthDigit = num - HundDigit*100;
  TenthDigit = TenthDigit/10;
  if (HundDigit==0 && TenthDigit==0){}
  else
  writedata(TenthDigit+0x30);
  UnitDigit = num - HundDigit*100;
  UnitDigit = UnitDigit - TenthDigit*10;
  writedata(UnitDigit+0x30);
  writedata('.');
  decimal=(point%10);
  writedata (decimal+0x30);
  writedata(' '); writedata('C');
}

void timer_init(){
  TMOD=0x01;         //16 bit timer mode of timer0
  TH0=0xFE;   //for delay
  TL0=0x0C;   //for 500microsec delay
  IE=0x82;                 //Only the timer0 interupts is acknowbuzged
}


void read(){     // Displays "READING" while controller reads from ADC
writecmd(0x95);
writedata('R');writedata('E');writedata('A');writedata('D');writedata('I');writedata('N');writedata('G');writedata(' ');
}

void reg_no_print(){
writecmd(0x0E);    //turn display ON for cursor blinking
writecmd(0x01);    //clear screen
writecmd(0x06);        //increment cursor
 writedata('T');
 writedata('E');
 writedata('M');
 writedata('P');
 writedata(':');
 }
```

Output result on LCD: -



LCD1
LM044L
TEMP:
READING 8.0 C_
VSS VDD VEE RS RW E D0 D1 D2 D3 D4 D5 D6 D7
(+VS)
U2(VREF/2)
C1
150pF
R1
10k
grnd
rd
wr
intr
U2
CS
RD
WR
CLK IN
INTR
A GND
D GND
VREF/2
CLK R
VIN+
VIN-
VCC
DB0(LSB)
DB1
DB2
DB3
DB4
DB5
DB6
DB7(MSB)
ADC0804
8.0
VOUT
XTAL1
XTAL2
RST
PSEN
ALE
EA
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
P0.0/AD0
P0.1/AD1
P0.2/AD2
P0.3/AD3
P0.4/AD4
P0.5/AD5
P0.6/AD6
P0.7/AD7
P2.0/A8
P2.1/A9
P2.2/A10
P2.3/A11
P2.4/A12
P2.5/A13
P2.6/A14
P2.7/A15
P3.0/RXD
P3.1/TXD
P3.2/INT0
P3.3/INT1
P3.4/T0
P3.5/T1
P3.6/WR
P3.7/RD
AT89C51
BUZ1(1)
BUZ1
BUZZER
A
B
C
D