8051(micro-controller) using LCD Display

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AVVA PRAVEEN BABU

BU21EECE01000527

Learning Objective:

- Learning how to use the 8051 microcontroller to display text on an LCD.

Inputs and Outputs:

- ☐ **Inputs:** Commands for the LCD display.
- ☐ **Output:** Displayed text on the LCD.

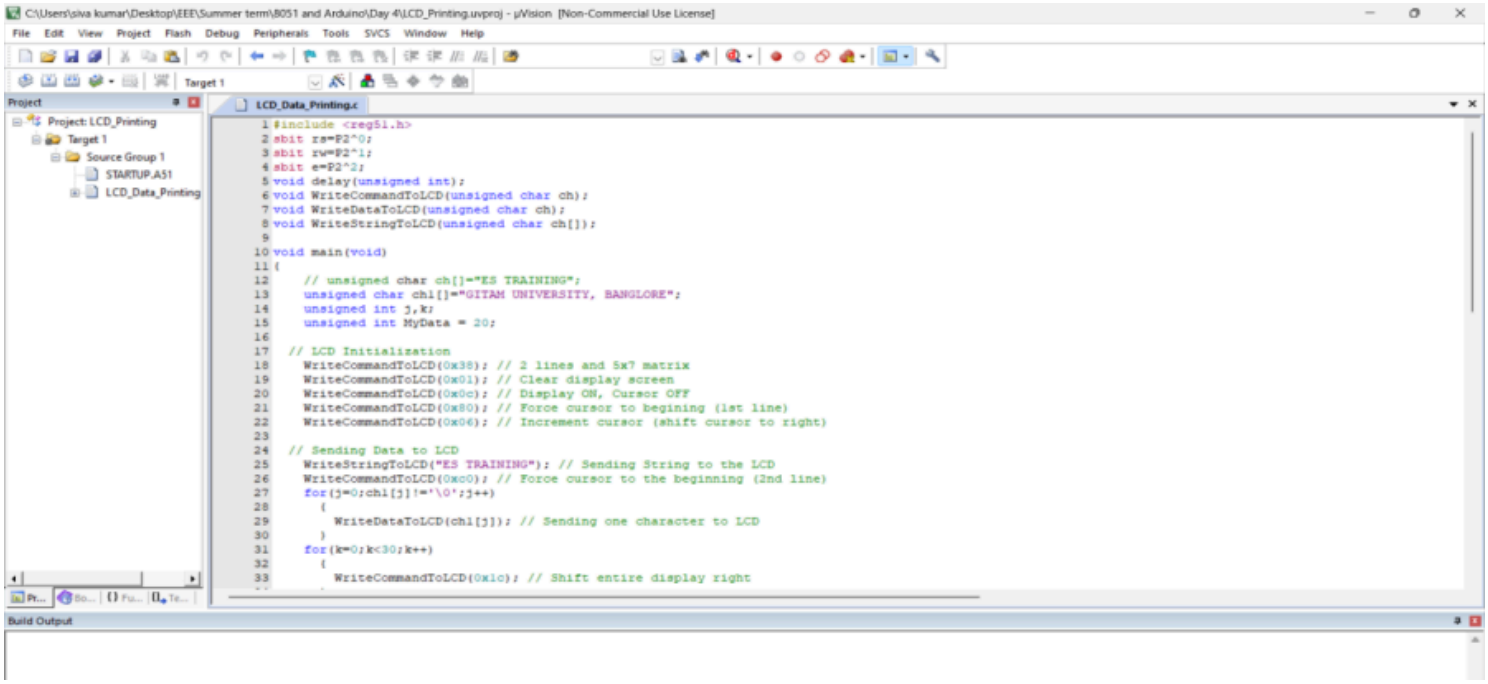
Logic:

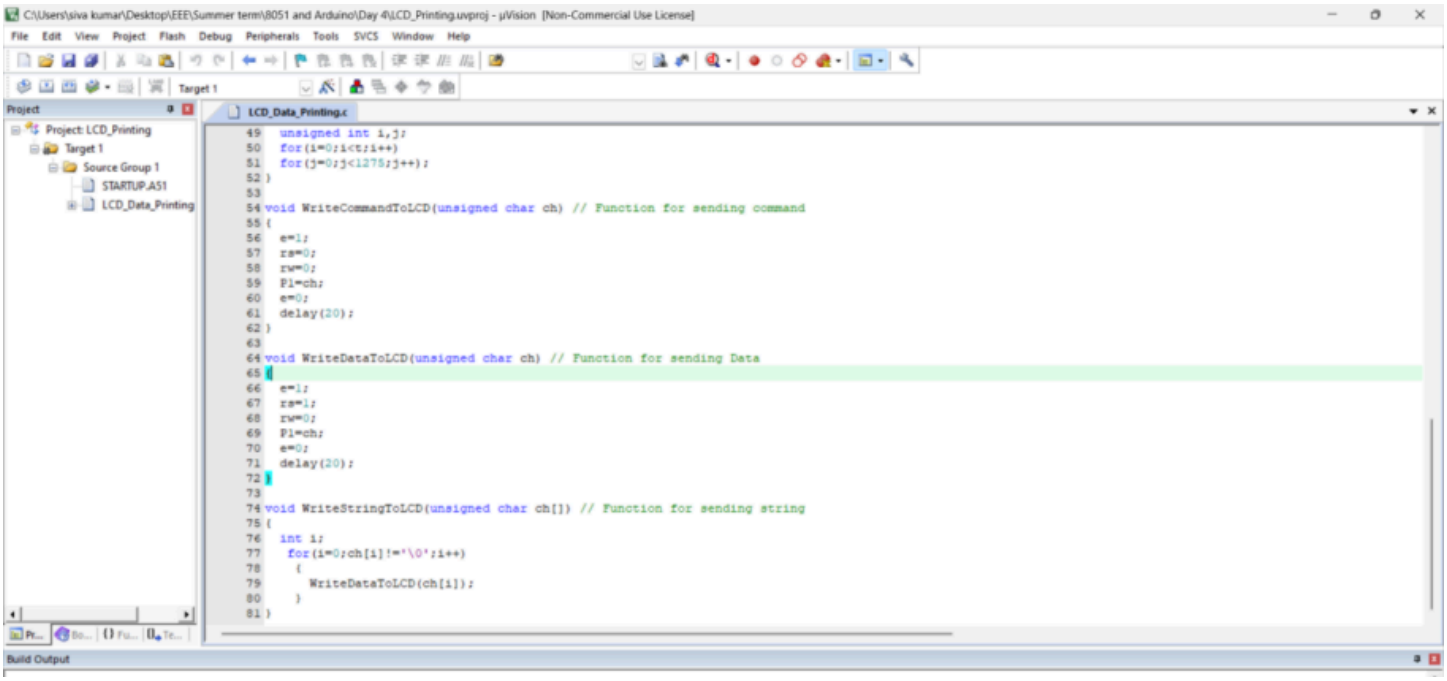
- Functions must be implemented to send commands and data to the LCD.
- Some LCD commands are, for example, clear display and cursor positioning. ☐
- Before displaying numerical data as symbols, they should first be converted to ASCII.
- Establish basic connections with the power supply and ground and enable pins.

Common Mistakes:

- **Command mismatch**: Be sure the correct commands are being sent to the LCD.
- **Command positioning**: Proper display requires placing commands properly.
- **Clear display and new line commands:** Use the right commands that would either clear the display or take you to a new line for of these commands

Results:-


C:\Users\siva kumar\Desktop\EEE\Summer term\8051 and Arduino\Day 4\LCD_Printing.uvproj - µVision [Non-Commercial Use License]
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Target 1
Project
Project: LCD_Printing
Target 1
Source Group 1
STARTUP.A51
LCD_Data_Printing
LCD_Data_Printing.c
1 #include <reg51.h>
2 sbit rs=P2^0;
3 sbit rw=P2^1;
4 sbit e=P2^2;
5 void delay(unsigned int);
6 void WriteCommandToLCD(unsigned char ch);
7 void WriteDataToLCD(unsigned char ch);
8 void WriteStringToLCD(unsigned char ch[]);
9
10 void main(void)
11 {
12 // unsigned char ch[]="ES TRAINING";
13 unsigned char ch1[]="GITAM UNIVERSITY, BANGLORE";
14 unsigned int j,k;
15 unsigned int MyData = 20;
16
17 // LCD Initialization
18 WriteCommandToLCD(0x38); // 2 lines and 5x7 matrix
19 WriteCommandToLCD(0x01); // Clear display screen
20 WriteCommandToLCD(0x0c); // Display ON, Cursor OFF
21 WriteCommandToLCD(0x80); // Force cursor to begining (1st line)
22 WriteCommandToLCD(0x06); // Increment cursor (shift cursor to right)
23
24 // Sending Data to LCD
25 WriteStringToLCD("ES TRAINING"); // Sending String to the LCD
26 WriteCommandToLCD(0xc0); // Force cursor to the beginning (2nd line)
27 for(j=0;ch1[j]!='\0';j++)
28 {
29 WriteDataToLCD(ch1[j]); // Sending one character to LCD
30 }
31 for(k=0;k<30;k++)
32 {
33 WriteCommandToLCD(0x1c); // Shift entire display right
Build Output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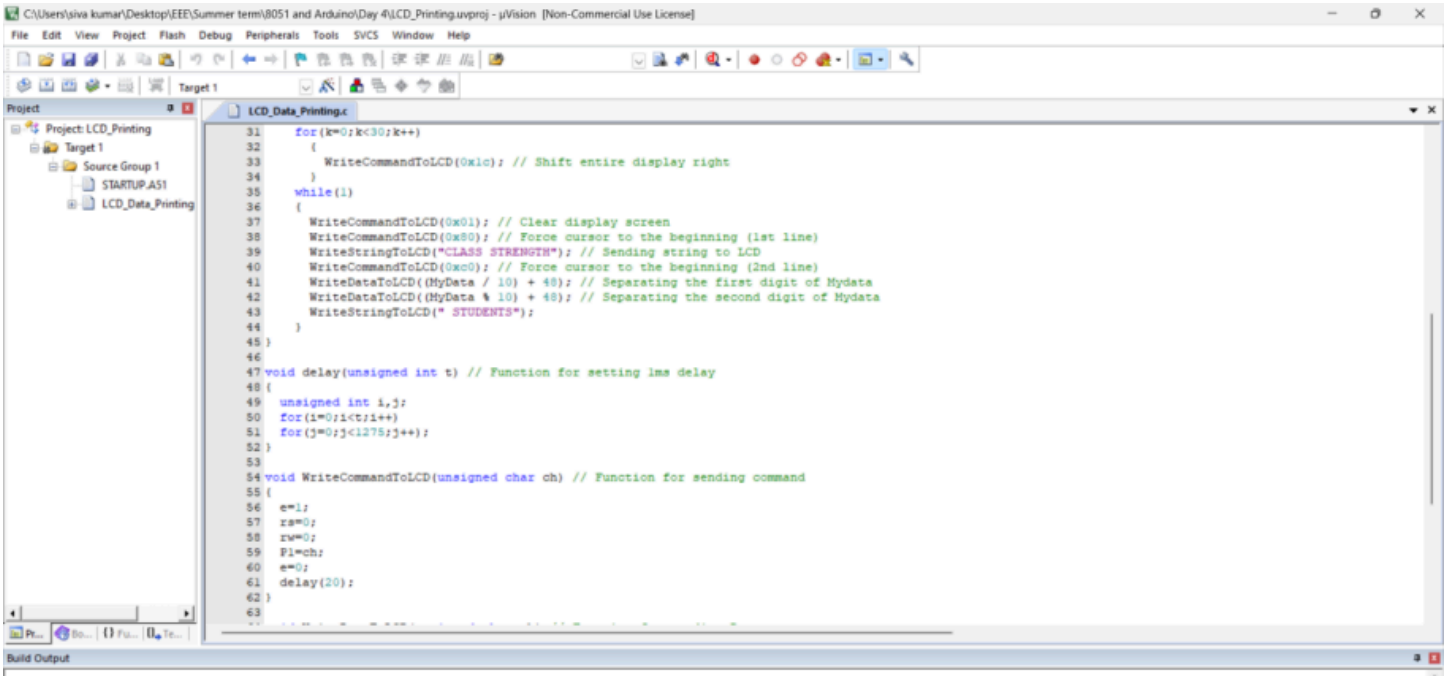
Target 1
Project
Project: LCD_Printing
Target 1
Source Group 1
STARTUP.A51
LCD_Data_Printing
LCD_Data_Printing.c
49 unsigned int i,j;
50 for(i=0;i<t;i++)
51 for(j=0;j<1275;j++);
52 }
53
54 void WriteCommandToLCD(unsigned char ch) // Function for sending command
55 {
56 e=1;
57 rs=0;
58 rw=0;
59 P1=ch;
60 e=0;
61 delay(20);
62 }
63
64 void WriteDataToLCD(unsigned char ch) // Function for sending Data
65 {
66 e=1;
67 rs=1;
68 rw=0;
69 P1=ch;
70 e=0;
71 delay(20);
72 }
73
74 void WriteStringToLCD(unsigned char ch[]) // Function for sending string
75 {
76 int i;
77 for(i=0;ch[i]!='\0';i++)
78 {
79 WriteDataToLCD(ch[i]);
80 }
81 }
Build Output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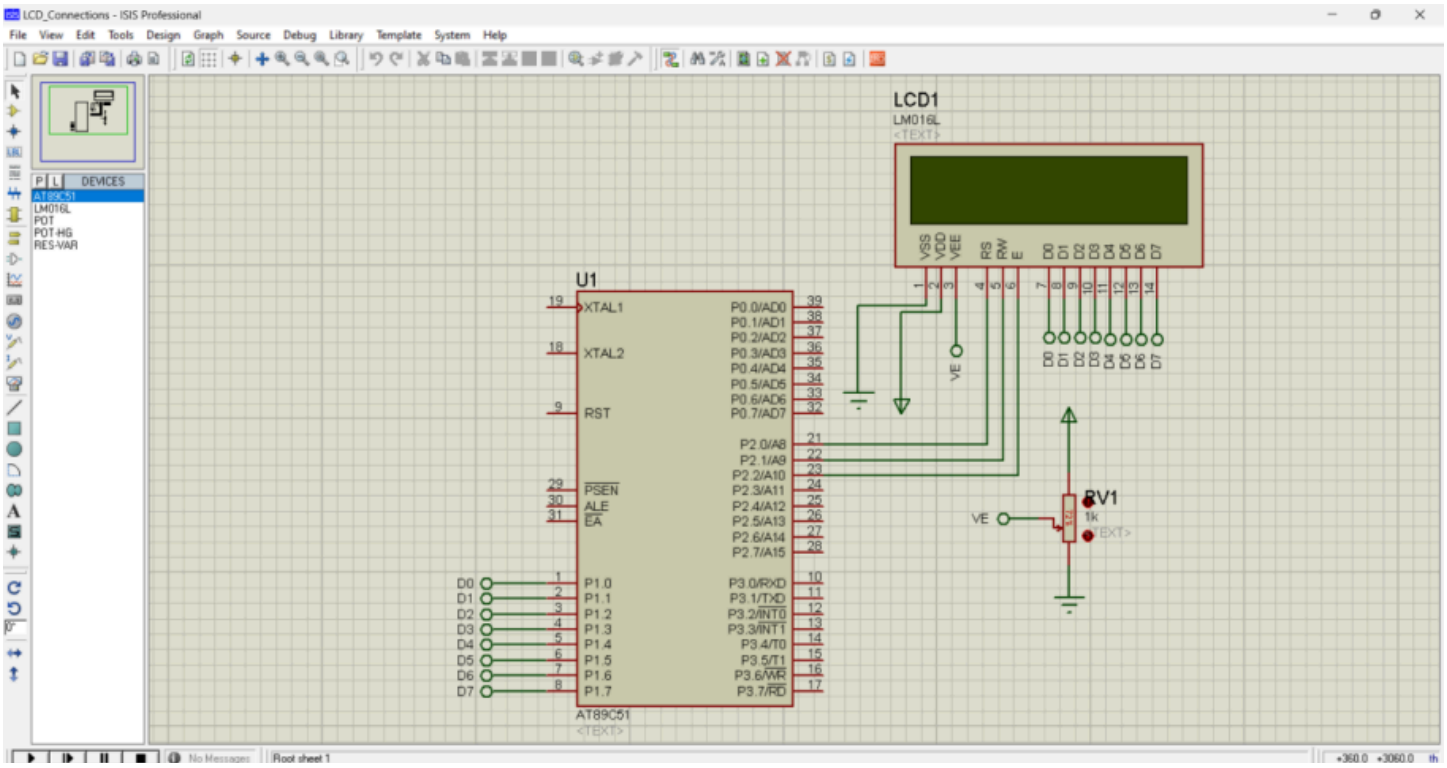
Target 1
Project
Project: LCD_Printing
Target 1
Source Group 1
STARTUP.A51
LCD_Data_Printing
LCD_Data_Printing.c
31 for(k=0;k<30;k++)
32 {
33 WriteCommandToLCD(0x1c); // Shift entire display right
34 }
35 while(1)
36 {
37 WriteCommandToLCD(0x01); // Clear display screen
38 WriteCommandToLCD(0x80); // Force cursor to the beginning (1st line)
39 WriteStringToLCD("CLASS STRENGTH"); // Sending string to LCD
40 WriteCommandToLCD(0xc0); // Force cursor to the beginning (2nd line)
41 WriteDataToLCD((Hydata / 10) + 48); // Separating the first digit of Hydata
42 WriteDataToLCD((Hydata % 10) + 48); // Separating the second digit of Hydata
43 WriteStringToLCD(" STUDENTS");
44 }
45 }
46
47 void delay(unsigned int t) // Function for setting 1ms delay
48 {
49 unsigned int i,j;
50 for(i=0;i<t;i++)
51 for(j=0;j<1275;j++);
52 }
53
54 void WriteCommandToLCD(unsigned char ch) // Function for sending command
55 {
56 e=1;
57 rs=0;
58 rw=0;
59 P1=ch;
60 e=0;
61 delay(20);
62 }
63
Build Output


LCD_Connections - ISIS Professional
File View Edit Tools Design Graph Source Debug Library Template System Help
DEVICES
AT89C51
LM016L
POT
POT-HG
RES-VAR
LCD1
LM016L
<TEXT>
VSS VDD VEE RS RW E D0 D1 D2 D3 D4 D5 D6 D7
U1
XTAL1
XTAL2
RST
PSEN
ALE
EA
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
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
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
<TEXT>
RV1
1k
<TEXT>
VE
No Messages
Root sheet 1