IET WINTER 2016
Embedded Systems Design
LAB 7

Objective:

At completion of the lab, student will be able to:

1. Get basic understanding of LCD.
2. Understand LCD interfacing with Atmega32.

Components Required for the Lab:

1. EasyAvr7 from MikroElectronika
2. USB cable for programming Atmega 32
3. LCD

LAB - 8 Resources:

1. LCD commands
2. Example Program
3. LCD command list
4. HD44780 Datasheet

Some useful Registers for this lab:

Use as required.

Lab Assignment:

Write and test following programs:

1. Write and test programs that display text at LCD as follows:

a. "HELLO" @ 1st Line 3rd Column & "WORLD" @ 2nd Line 5th Column.

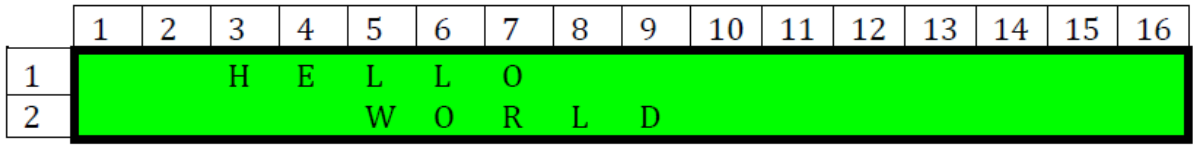

Figure 1.1

b. Display "Hello World" at first line for 5 seconds. After the completion of five seconds LCD is cleared and display "This works :) "for next 5 seconds.

For first five seconds:

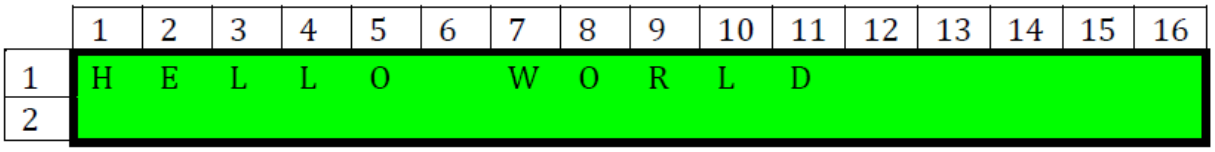

Figure 1.2

After 5 seconds the display shall be as followed for next 5 seconds.

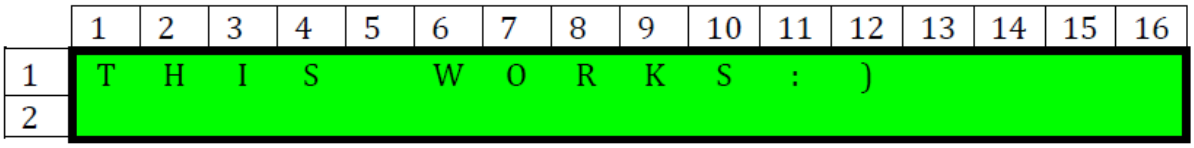

Figure 1.3

c. Rotate text "Welcome to ESD Lab" from left to right.
Delay: 0.5 Second
Start Position: Letter 'W' shall be at 1st Line 16th column.

2. 4 – digit Counter Display 2.0

Write a program that counts and displays the number of visitors at IET through LCD. The doorkeeper presses the push button every time a new visitor enters. The count value is displayed outside the dean's office in an LCD. Once the value reaches 9999, display and rotate text "Dean needs a break. Please come tomorrow". See the figures for how the display could be for count value between 0000-9999.

Count value may change, though other text will remain the same.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	W	e	l	c	o	m	e		to		I	E	T			
2	C	O	U	N	T	:	0	0	0	0						

3. PORTB Digital Input Status

Write a program that reads the digital input status of PORTB and displays that at an LCD. The display will toggle between two different texts. For, one second it will display text "PORTB STATUS" (Figure: 3.1) and for the next one second it will display '7-0' in one line and PORTB digital input status in 2nd line (Figure: 3.2).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	*	*	*	*	*	P	O	R	T	B	*	*	*	*	*	*
2	*	*	*	*	*	S	T	A	T	U	S	*	*	*	*	*

Figure 3.1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1		7		6		5		4		3		2		1		0
2		0		0		1		1		0		0		0		1

Figure 3.2 (If PORTB digital input status is 0011 0001)