Dhaka University of Engineering & Technology (DUET), Gazipur

Department of Computer Science and Engineering (CSE)

Course Title: Microprocessor & Interfacing Sessional (CSE 3812)

Lab: 04

Controlling the seven segment display of MDA-8086 Kit.

Objectives:

To interface a 7-segment display with 8086 microprocessors by 8255 PPI

Basic Theory:

The 7 segment inside the MDA-8086 trainer kit can be used to display numbers. This requires PIO 8255 8255 ports which are already connected to the 7-segment internally. Through the code we can access the PIO 8255 ports and provide binary or hex value to switch the required segment on and off. In order to turn a segment ON, a logical 0 is required as shown below. Any number from 0-9 can be displayed on the 7 segment by providing the actual hex or binary value which turns those segments ON to display the digit.

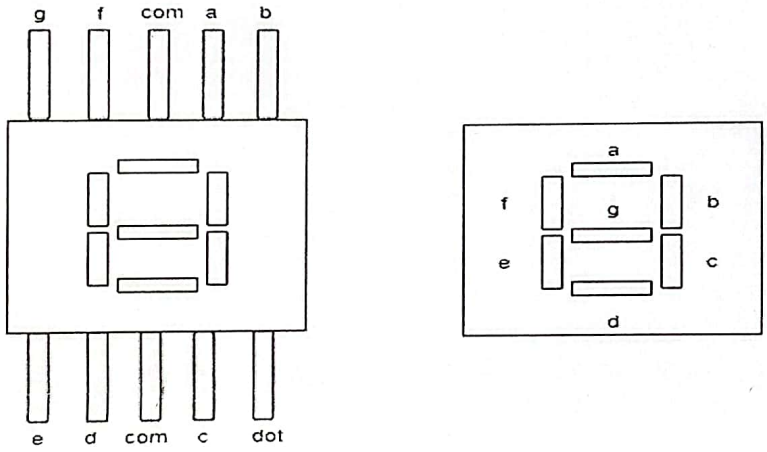

Fig: 7-segment display

g 4 2 1				g 4 2 1					
dp	g	f	e	d	c	b	a	Dec Value	Hex Value
0	1	0	0	0	0	0	0	0	40
1	1	1	1	1	0	0	1	1	F9
1	0	1	0	0	1	0	0	2	A4
1	0	1	1	0	0	0	0	3	B0
1	0	0	1	1	0	0	1	4	99
1	0	0	1	0	0	1	0	5	92
1	0	0	0	0	0	1	0	6	82
1	1	1	1	1	0	0	0	7	F8
1	0	0	0	0	0	0	0	8	80
1	0	0	1	0	0	0	0	9	90

Example: Program to display '3' in 7-segment display.

```
CODE SEGMENT
ASSUME CS: CODE, DS: CODE
ORG         1000H           ;The code is placed at offset 1000h
MOV         AL, 10000000B   ;Mode set for Control Word to control 8255 PPI
OUT         1FH, AL         ; Transfer information from Source to Destination
MOV         AL, 10110000B   ; Data for displaying '3' provided in Accumulator
OUT         19H, AL         ; Data transfer to Output port
INT         3               ; Single-step interrupt
CODE ENDS
END
```

Write an assembly language program to show all the digits (0~9) on the 7 segment display at a time (using Pause/delay so that each digit can be seen for a certain interval of time).