<u>**Experiment No. 09**</u>

9.1 Experiment Name

8255 PPI interfacing: LED

9.2 Objectives

- To get acquainted with the "MDA 8086" Trainer Board and its operation
- To understand working procedure of LED interfacing
- To learn how to implement program in "MDA 8086" Trainer Board and interconnect it with "Emu 8086"

9.3 Theory

For this experiment, we applied 8255 interfacing in LED. Four LEDs are connected to Port B's bottom four pins. Typically, the ground is connected to LED cathodes. The 8255 microcontrollers have four general-purpose I/O ports that can be configured as input or output. By designating the port pins as output, the state of the port pins can be managed and modified to high or low. When the port is configured as an input, reading the pins will show the voltage state of the pins. The port pins must be configured as outputs in order for the LED to flash.

Port name	Port address
Port A	18H
Port B	1AH
Port C	1CH
Control register	1EH

9.4 Apparatus

- MDA 8086 - Trainer Board

9.5 Experimental problem no. 01

```
CODE SEGMENT
ASSUME CS: CODE, DS: CODE, ES: CODE, SS: CODE
ORG 1000H
PORTA EQU 1BH
CNTRL EQU 1FH
MOV AL,10000000B
OUT CNTRL, AL
MOV CL,5
L1:
MOV AL,00000001B
OUT PROTB, AL
CALL DELAY
MOV AL,00000010B
OUT PROTB, AL
CALL DELAY
MOV AL,000001000B
OUT PROTB, AL
CALL DELAY
```

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```
MOV AL,000000100B
OUT PROTB, AL
CALL DELAY
LOOP L1
DELAY PROC
MOV CX,0FFFFH
LOOP1:
NOP
NOP
NOP
NOP
LOOP LOOP1
RET
DELAY ENDP
CODE ENDS
END
```

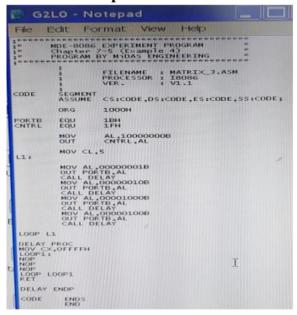## 9.6 Output as clockwise direction in Z pattern

Fig. 9.1: Writing program on notepad

Fig. 9.2: Output

9.7 Discussion & Conclusion

In this experiment, we used code to perform the LED interfacing. A program was developed in notepad and saved as **'.asm'** file, which was then translated to **'.obj'** and later into a **'.abs'** file. This was then executed and the output was observed using direct execution.

Here, there were two more types of patterns available on the LED interface of the 8086 kits. Here, using programming, we activated the LEDs in two different directions: clockwise & z-pattern. Therefore, it may be concluded from all of the foregoing talks that the experiment was a success.

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