AY: 2024-25

Class:	SE	Semester:	IV
Course Code:	CSL404	Course Name:	Microprocessor Lab

Name of Student:	Shravani Sandeep Raut
Roll No. :	48
Experiment No.:	9
Title of the Experiment:	Program for interfacing 8086 with 8255 PPI
Date of Performance:	20/03/2025
Date of Submission:	27/03/2025

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Performance	5	
Understanding	5	
Journal work and timely submission	10	
Total	20	

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Performance	4-5	2-3	1
Understanding	4-5	2-3	1
Journal work and timely submission	8-10	5-8	1-4

Checked by

Name of Faculty : Ms. Sweety Patil

Signature :

Date:

Aim: 8255 is configured in mode O is simple Inuput / Output Mode. Ports A,B,C are in mode 0. All the posts are in output mode and data is transmitted to the respective ports.

Apparatus : Microprocessor 8086 and 8255 PPI experimental setup kit

Theory:

The programmable Peripheral Interface chip 8255 has three 8-bit Input / Output ports i.e. Port A, Port B, Port C upper (PCU) and Port C lower (PCL). Direct bit set/reset capability is available for port C. 8255 is a very powerful tool for interfacing peripheral equipment to the microprocessor. It is flexible enough to interface with any I/o device without the need of external logic.

Procedure :

1. Connect 8086 kit to 8255 PPI kit using 50 pin FRU cable.

2. Default I/O address ranges are :

SELECTION	ADDRESS
Port A	30 H
Port B	31 H
Port C	32 H
Command Port	33 H

3. 80 H is the control word for 8255. It is set in simple I/O mode and all the ports are in output mode 0

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	0	0	0	0	0

Always 1 Port C2 for I/O (output) Group A mode 0 Port A (output) Port C1 (output) Group B (output) Port B (output)

4. The LED's connected to the pins at Port A glow according to the data transmitted on port A.

5. The LED's connected to the pins of port B glow according to the data transmitted on Port B.

6. The LED's connected to the pins of port C glow according to the data transmitted on Port C.

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Program :

Segment : C000
Offset :   C000

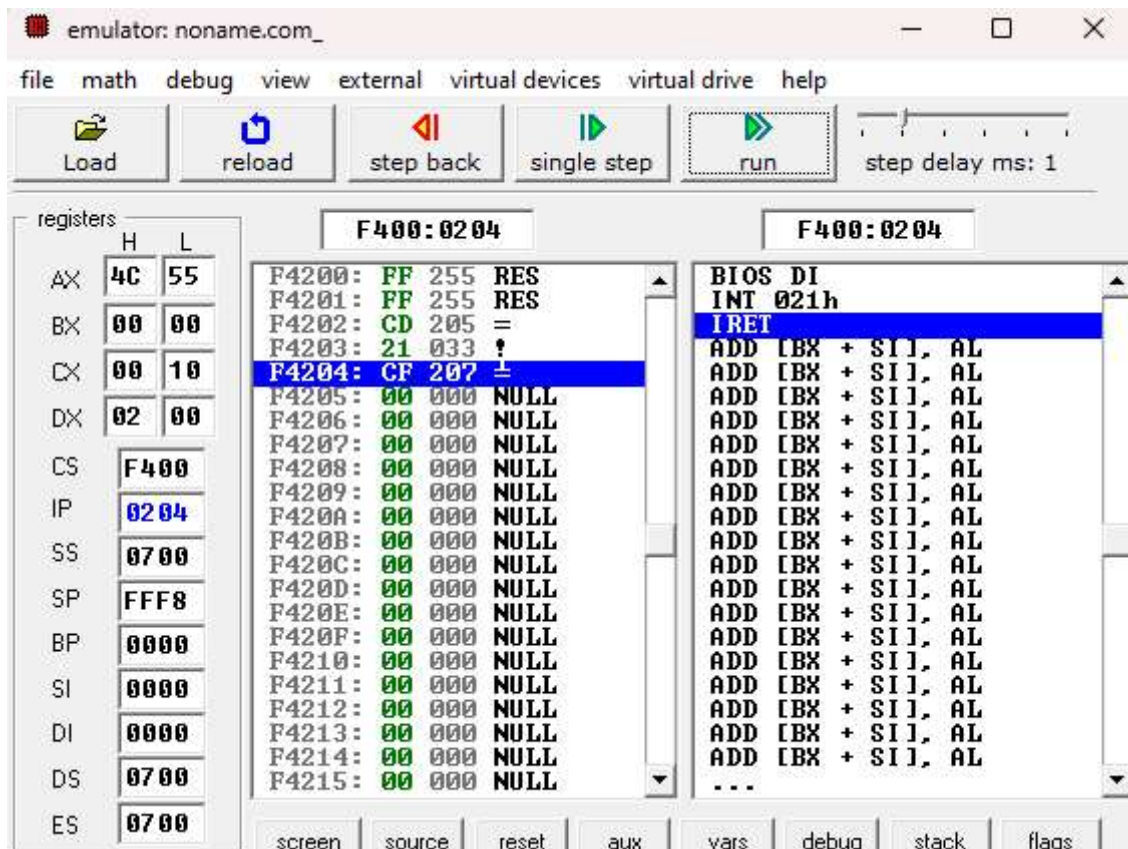| Memory	Opcode	Instructions	Comments
C000	B0	MOV AL,80H	Mode 0, All ports in output mode
C001	80		
C002	E6	OUT CWR, AL	
C003	33		
C004	B0	MOV AL, 55H	Data for Port A
C005	55		
C006	E6	OUT PORT A,AL	
C007	30		
C008	B0	MOV AL,AAH	Data for port B
C009	AA		
C00A	E6	OUT PORT B,AL	
C00B	31		
C00C	B0	MOV AL,0FH	Data for port C
C00D	0F		
C00E	E6	OUT PORTC,AL	
C00F	32		
C010	CC	INT 3	Stop

Code –

```
org 100h

.model small
.data
port_A_address equ 0200h

.code
main proc
    mov ax, @data
    mov ds, ax
    mov dx, port_A_address
    mov al, 55h
    out dx, al
    mov ah, 4Ch
    int 21h
    main endp
End main

ret
```

Output-

Conclusion :

The program initializes all ports (A, B, and C) in output mode, sets specific data for each port (80H for Port A, 55H for Port B, and 0FH for Port C), and sends the data to control the LEDs connected to the respective ports. After transmitting the data, the program halts using an interrupt (INT 3). This sequence allows for a controlled display of LED patterns, with each port displaying a different bit pattern.

1. Explain the modes of 8255.

   The 8255 PPI has three modes of operation:

   1. **Mode 0 (Basic I/O Mode):** Simple input/output for all ports, no handshaking or control signals.

   2. **Mode 1 (Strobed I/O Mode):** Supports handshaking for controlled data transfer, using control signals on Port C.

   3. **Mode 2 (Bidirectional Bus Mode):** Allows bidirectional data transfer on Port A, with Port C providing control signals.

   Each mode offers different levels of control, from basic data transfer to more complex, synchronized communication.

2. Explain the format of control word of 8255 PIC

   The control word of the 8255 Programmable Peripheral Interface (PPI) is used to configure the mode of operation for the ports (A, B, and C) and specify the direction of data flow (input or output). The format of the control word consists of an 8-bit value, where each bit has a specific function.

   Explanation of the Bits:

- **Bits 0-1 (Port C Mode Control):**

   ○ These bits define the mode for Port C (either output or input). For Mode 0, Port C is used as simple I/O, but in Mode 1 or Mode 2, it is used for control and handshaking.

- **Bits 2-3 (Mode Selection for Ports A and B):**

   ○ These bits define the operation mode for Ports A and B. The options are:

      ■ **00**: Basic input/output (Mode 0).

      ■ **01**: Strobed input/output with handshaking (Mode 1).

      ■ **10**: Bidirectional bus mode for Port A (Mode 2).

- **11**: Reserved or undefined.

- **Bit 4 (Direction for Port A):**

  ○ This bit sets the direction of Port A:

    - **0**: Port A is configured as an output.

    - **1**: Port A is configured as an input.

- **Bit 5 (Direction for Port B):**

  ○ This bit sets the direction of Port B:

    - **0**: Port B is configured as an output.

    - **1**: Port B is configured as an input.

- **Bit 6 (Control for Port C):**

  ○ In Modes 1 and 2, this bit is used to configure the control lines for Port C, managing handshaking or enabling/disabling certain control features.

- **Bit 7 (Mode Selection):**

  ○ This bit determines the mode of operation for the 8255:

    - **0**: Mode 0 (Basic I/O).

    - **1**: Mode 1 (Strobed I/O) or Mode 2 (Bidirectional).