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Title:	Program for interfacing 8086 with 8255 PPI.
Date of Performance:	22/03/24
Date of Submission:	05/04/24
Marks:	
Sign of Faculty:	

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

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

Program Code-
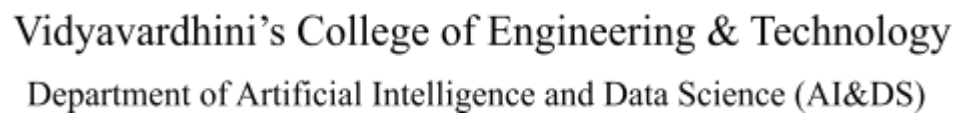
```
.model small

.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
```
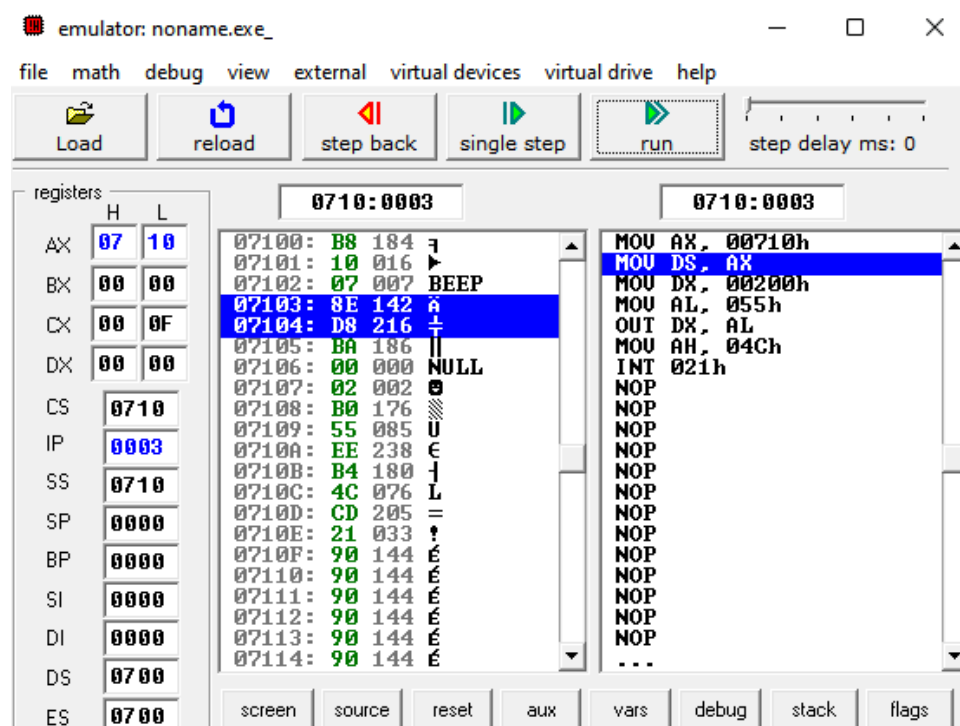
```
01
02    .model small
03    .data
04    port_A_address  equ  0200h
05    .code
06    main  proc
07    mov  ax,  @data
08    mov  ds,  ax
09    mov  dx,  port_A_address
10
11    mov  al,  55h
12    out  dx,  al
13
14    mov  ah,  4Ch
15    int  21h
16
17    main  endp
18    end  main
19
20
21
```

Conclusion :

The program establishes communication between an Intel 8086 microprocessor and an Intel 8255 Programmable Peripheral Interface (PPI) by configuring the PPI with a control word and using assembly code to write and read data from its ports (PORTA, PORTB, and PORTC). Customization may be needed for different hardware setups and application needs, and testing is crucial for reliability.

1. Explain the modes of 8255.

Ans. The 8255 is a Programmable Peripheral Interface (PPI) chip that provides I/O (Input/Output) ports configurable for different modes of operation. These modes allow the 8255 to function in various ways depending on the requirements of the application. The 8255 typically has three operational modes:

Mode 0 (Basic Input/Output Mode):

In Mode 0, the 8255 acts as a simple I/O port, with each of the three 8-bit ports (Port A

Port B, and Port C) operating independently as either inputs or outputs.

Each port can be configured individually as an input or an output using control words written to the control register.

Data can be written to output ports or read from input ports using IN and OUT instructions.

Mode 1 (Strobed Input/Output Mode):

In Mode 1, the 8255 functions similar to Mode 0, but with additional features for strobed I/O operations.

In this mode, the ports can be configured to work with handshaking signals, which are typically generated by external devices to synchronize data transfer.

Handshaking signals can be configured for both input and output operations, allowing for controlled data transfers between the 8255 and external devices.

Mode 2 (Bidirectional Bus I/O Mode):

In Mode 2, the 8255 operates as a bidirectional bus interface.

Port A is used for data transfer in one direction, while Port B is used for data transfer in the opposite direction.

Port C can be used for handshaking signals similar to Mode 1, enabling controlled data transfers.

This mode is useful for interfacing the 8255 with bidirectional data buses in microprocessor systems.

2.Explain the format of control word of 8255 PIC

The control word of the 8255 Programmable Peripheral Interface (PPI) is a 16-bit word used to configure the operation of the chip and its ports. It consists of various control bits that determine the mode of operation, direction of each port (input or output), and other settings. Here's a breakdown of the format of the control word:

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

 | Group B Control | Group A Control | Mode Selection |

Mode Selection (Bits 0-2): These bits determine the operational mode of the 8255 chip. Depending on the mode selected, the chip can operate in Mode 0, Mode 1, or Mode 2. The specific values of these bits correspond to different modes:

000: Mode 0 (Basic Input/Output Mode)

001: Mode 1 (Strobed Input/Output Mode)

010: Mode 2 (Bidirectional Bus I/O Mode)

Group A Control (Bits 3-7): These bits control the direction of Port A (PA) and other settings specific to Port A:

Bit 3: Port A Mode Selection (0 = Output, 1 = Input)

Bits 4-7: Additional settings for Port A (varies depending on the mode of operation)

Group B Control (Bits 8-12): These bits control the direction of Port B (PB) and other settings specific to Port B:

Bit 8: Port B Mode Selection (0 = Output, 1 = Input)

Bits 9-12: Additional settings for Port B (varies depending on the mode of operation)