Microprocessors and Interfaces: 2021-22
Lecture 28 :
8255 Programmable Peripheral Interface
Part:2

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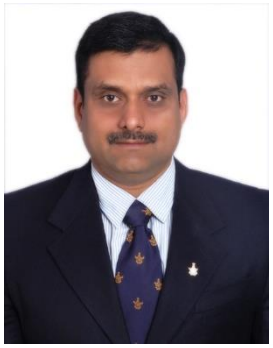
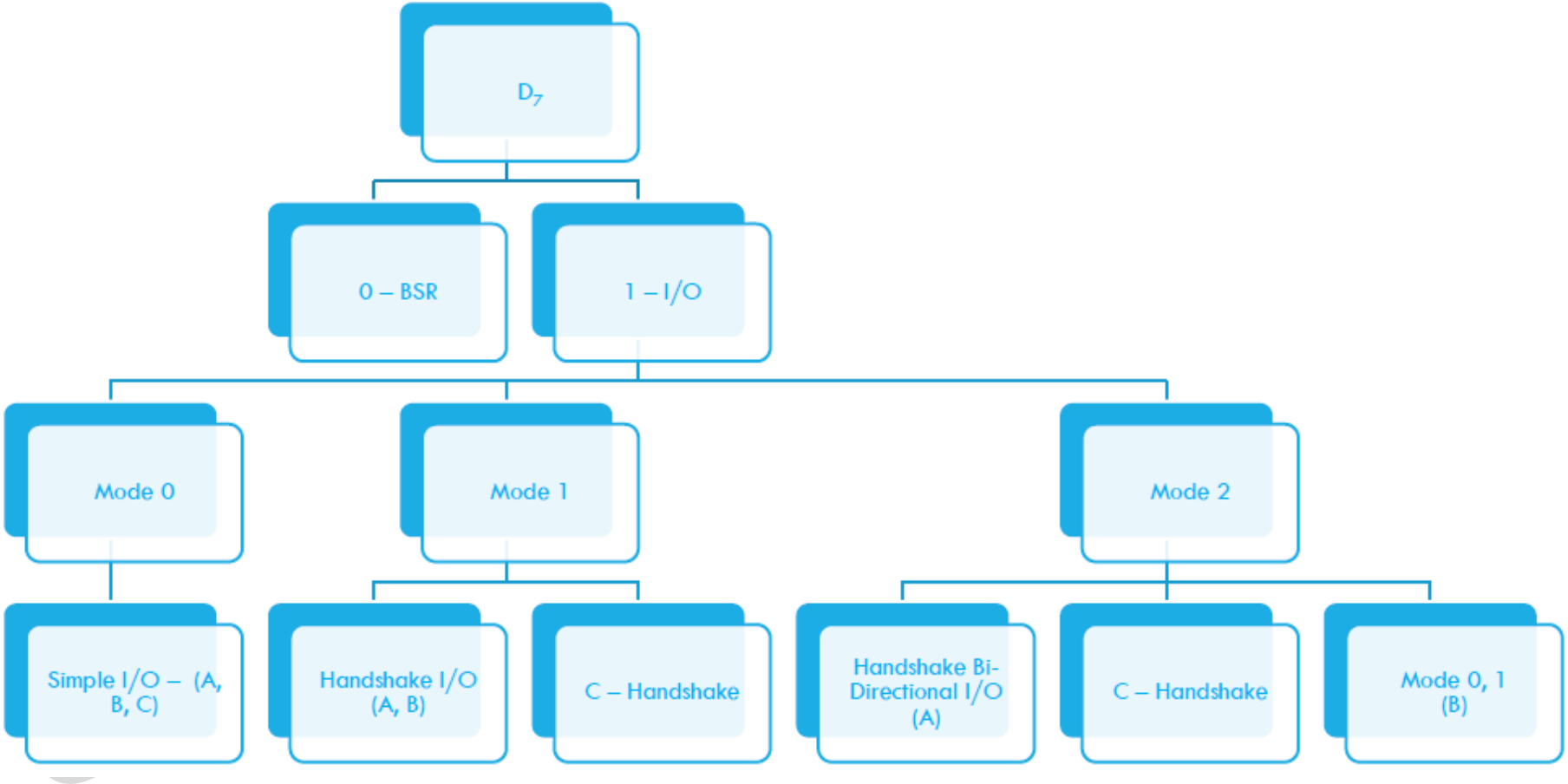
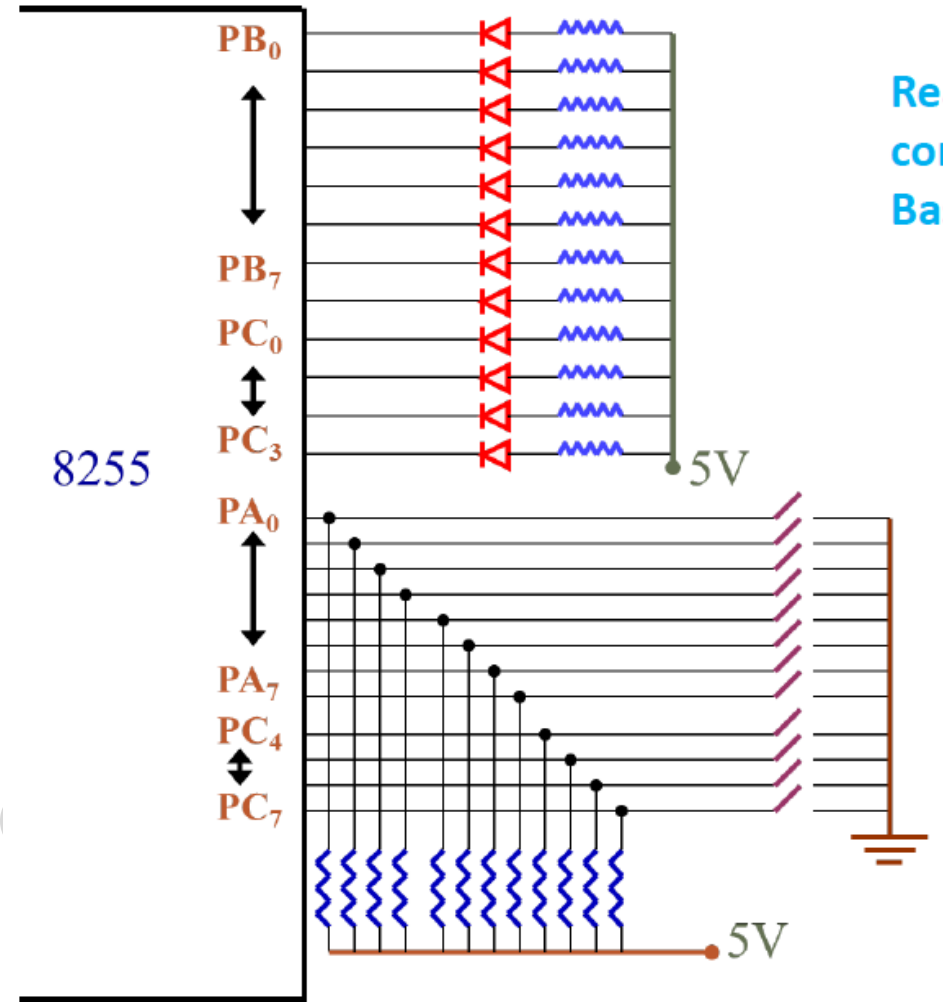


Modes of operation of 8255



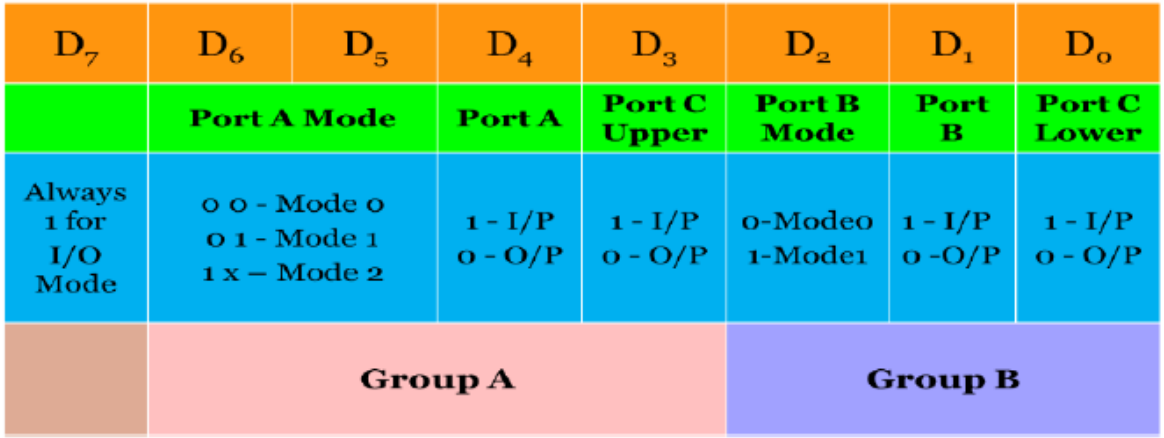
Example



Read 12 switches and display switch condition on 12 LEDs with 8255H and Base Address – 00H

Example

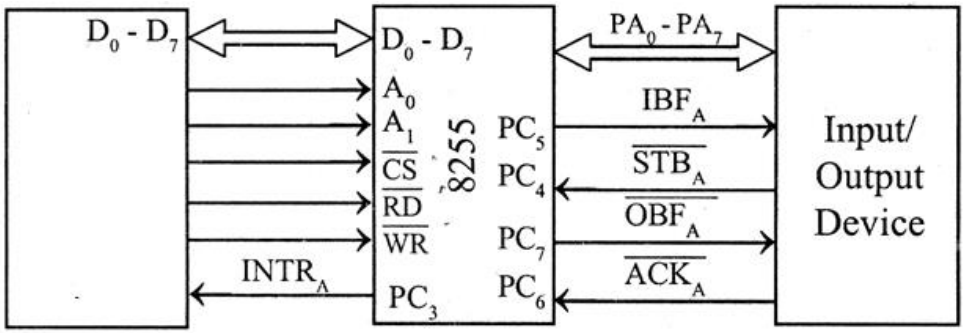
```
creg      equ    06h
porta     equ    00h
portb     equ    02h
portc     equ    04h
mov    al,10011000b
out    creg,al
in     al,porta
out    portb,al
in     al,portc
and    al,0f0h
mov    cl,04h
ror    al,cl
out    portc,al
```

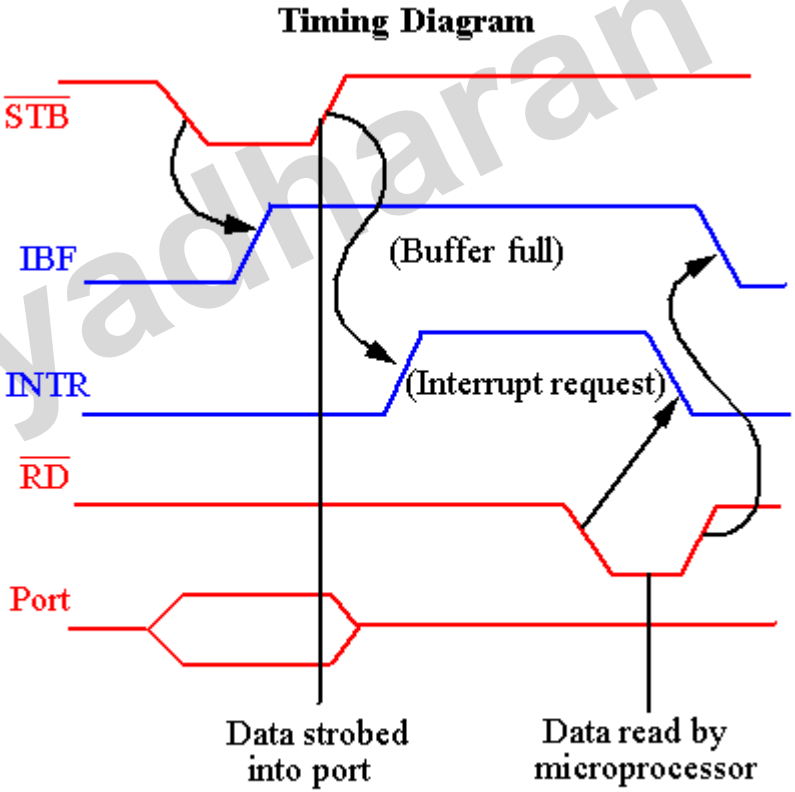


D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
	Port A Mode		Port A	Port C Upper	Port B Mode	Port B	Port C Lower
Always 1 for I/O Mode	0 0 - Mode 0 0 1 - Mode 1 1 x – Mode 2		1 - I/P 0 - O/P	1 - I/P 0 - O/P	0-Mode0 1-Mode1	1 - I/P 0 -O/P	1 - I/P 0 - O/P
	Group A				Group B		

Handshaking signal

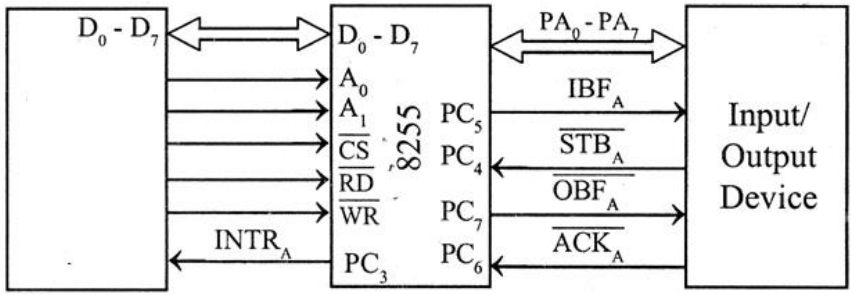
Input Read

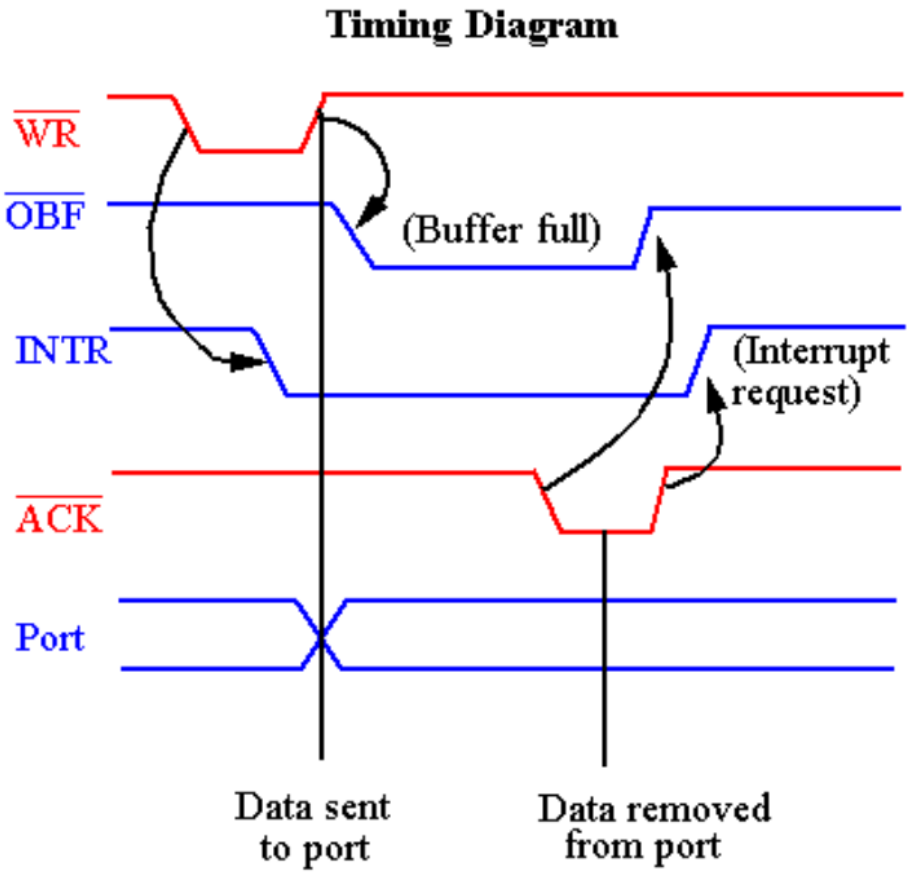




Handshaking signal

Output Write





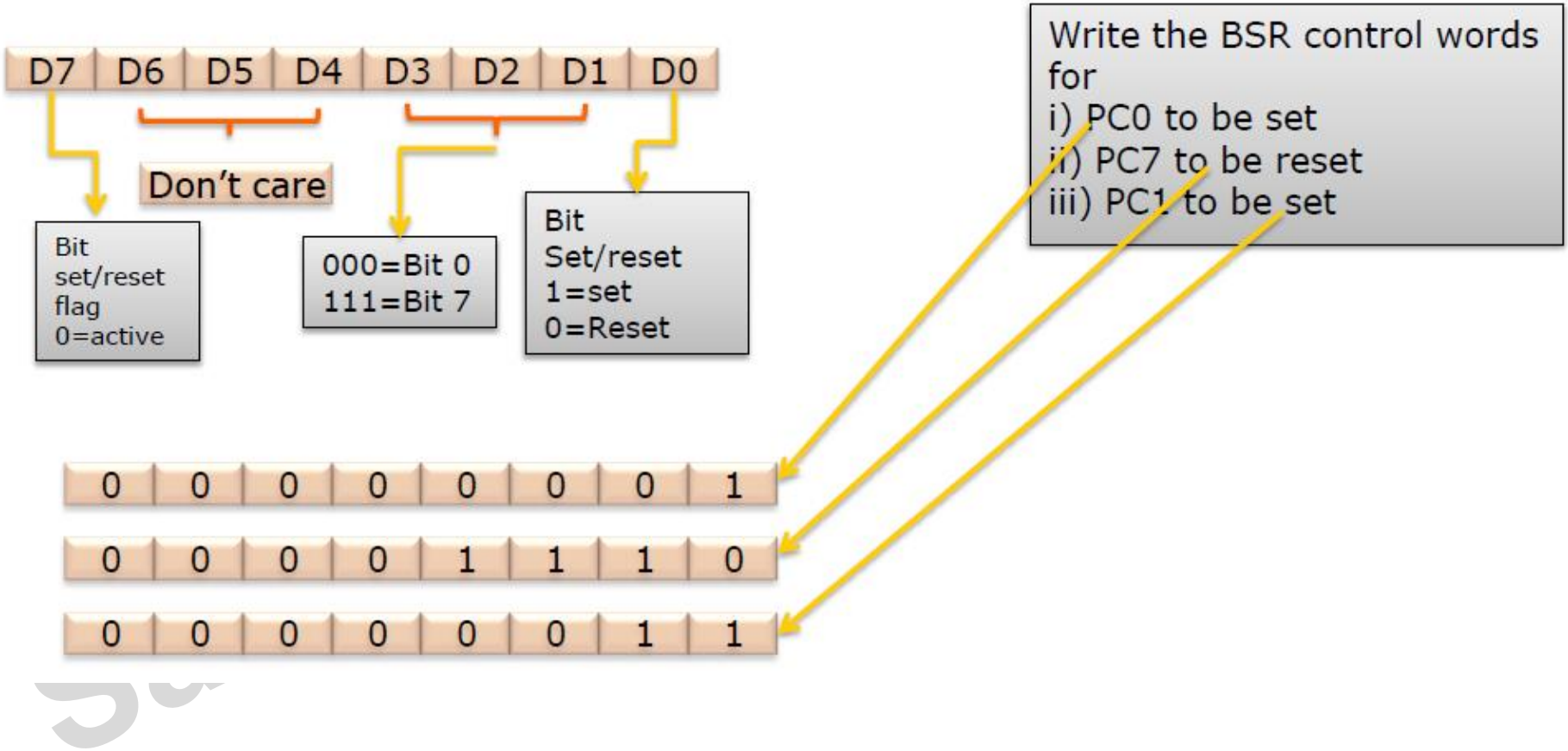
MODE 1 (Strobed I/O mode)

- Two groups – Group A and group B are available for strobe data transfer.
- Each group contains one 8 bit data I/O port and one four bit control / data port.
- Both the input and outputs are latched.
- Out of 8-bit port C , PC_0- PC_2 are used to generate control signals for port B and PC_3- PC_5 are used to generate control signals for port A.
- The lines PC_6- PC_7 may be used as independent data lines.

MODE 2 (Strobed Bidirectional I/O mode)

- A single 8-bit port in Group A is available.
- The 8 bit port is bidirectional and additionally a 5-bit control port is available..
- Both the input and outputs are latched.
- The 5-bit control port C , PC_3- PC_7 are used to generate/ accept handshake signals for port A.
- Three I/O lines are available at port C, PC_2- PC_0.

BIT Set Reset (BSR) mode

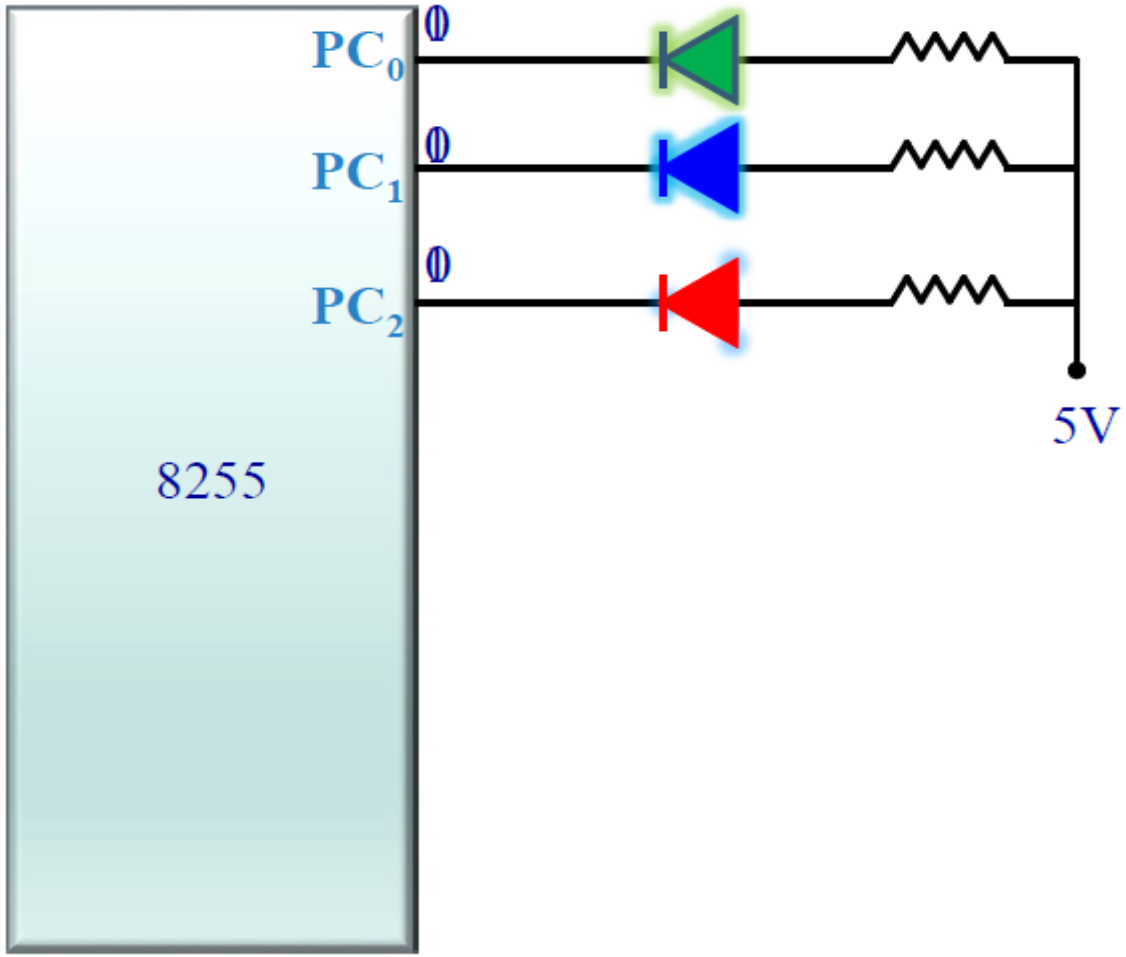


Example

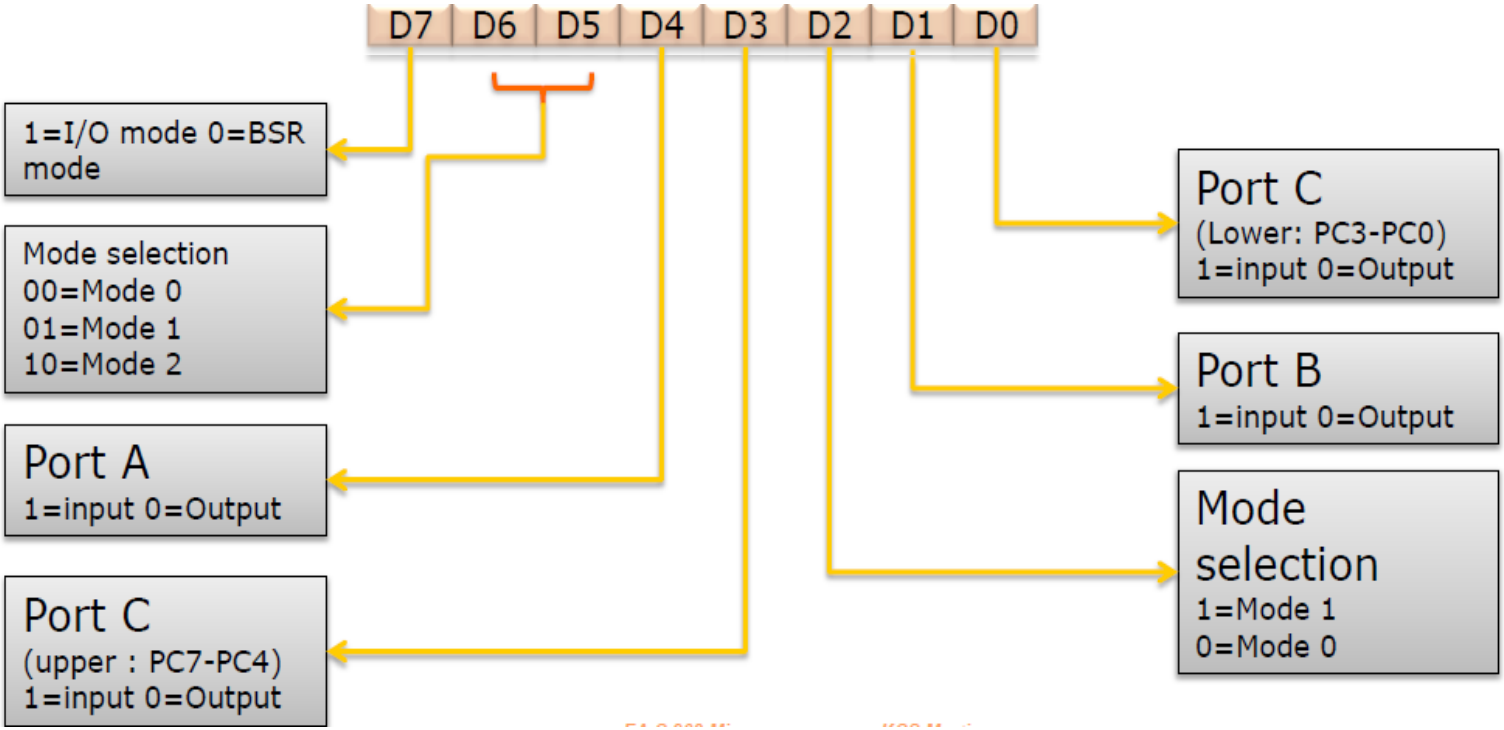
Example: Connect 3 LEDs to Port C. Blink one LED after another at regular intervals of 1ms

8255- Base address 00_H

Example



Example



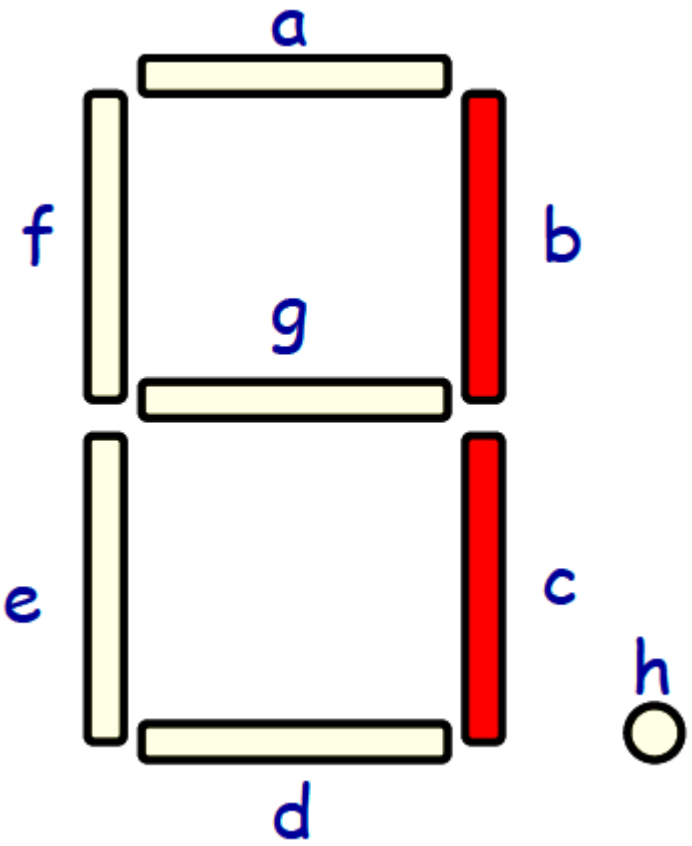
D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0 -BSR	x	x	x	Bit_2	Bit_1	Bit_0	Bit Set/Reset
	Don't Care Condition			PC: 0 1 2 3 4 5 6 7 B_0: 0 1 0 1 0 1 0 1 B_1: 0 0 1 1 0 0 1 1 B_2: 0 0 0 0 1 1 1 1			1 - Set 0 - Reset

Example

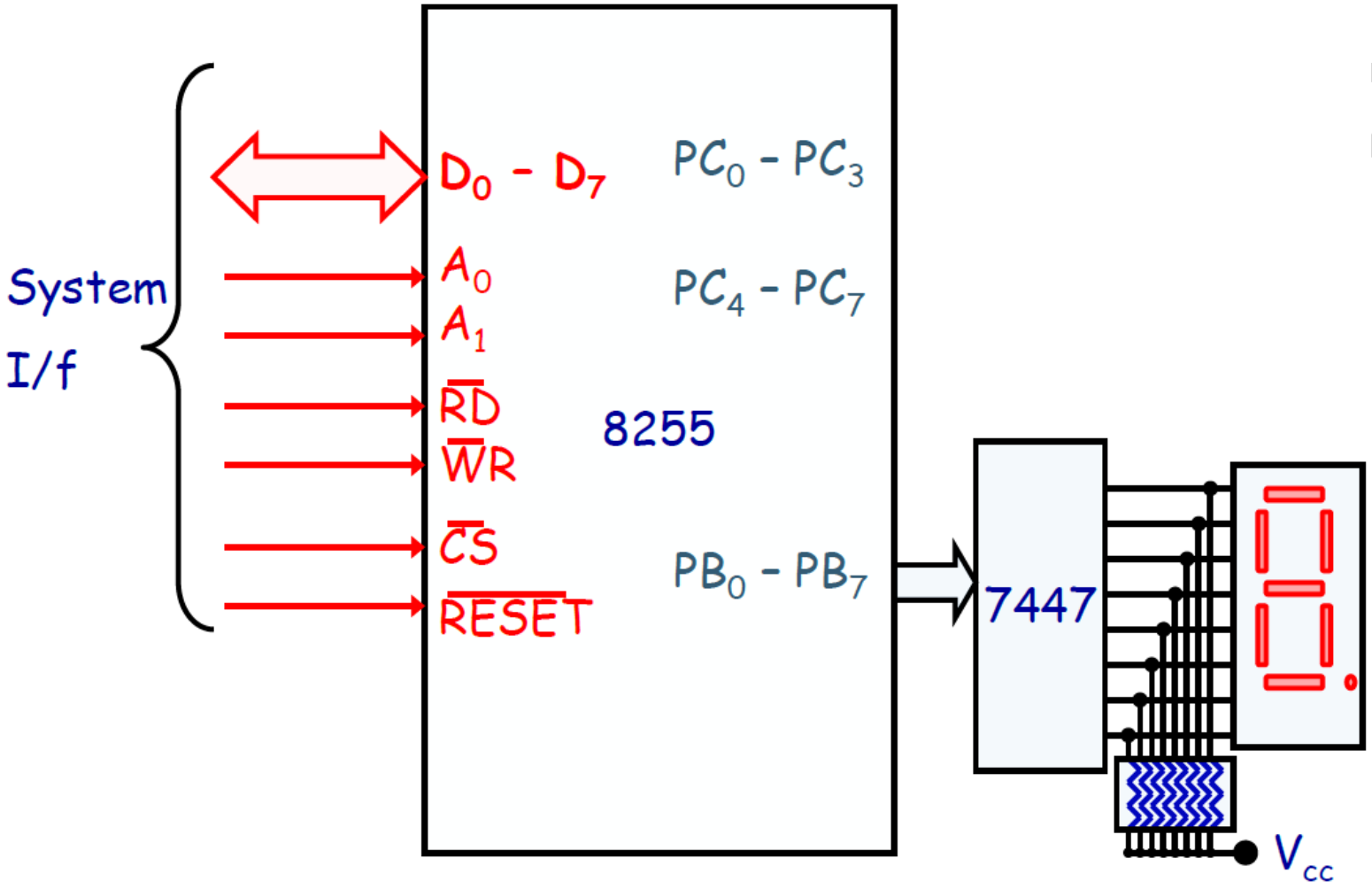
```
        CR EQU  06H
REPEAT: MOV AL, 00H
        OUT CR, AL
        MOV AL, 03H
        OUT CR, AL
        MOV AL, 05H
        OUT CR, AL
CALL delay_1ms
        MOV AL, 01H
        OUT CR, AL
        MOV AL, 02H
        OUT CR, AL
        MOV AL, 05H
        OUT CR, AL
CALL delay_1ms
        MOV AL, 01H
        OUT CR, AL
        MOV AL, 03H
        OUT CR, AL
        MOV AL, 04H
        OUT CR, AL
CALL delay_1ms
        JUMP REPEAT
```

```
DELAY   PROC NEAR
        MOV CX, 0EEH
HERE:   NOP
        LOOP HERE
        END
```

Display Interfacing



Display Interfacing



Thank You