



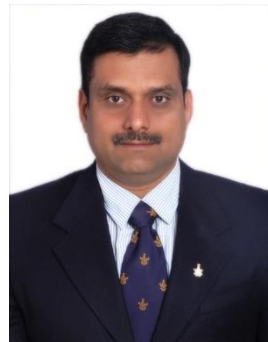
Microprocessors and Interfaces: 2021-22

Lecture 28 :

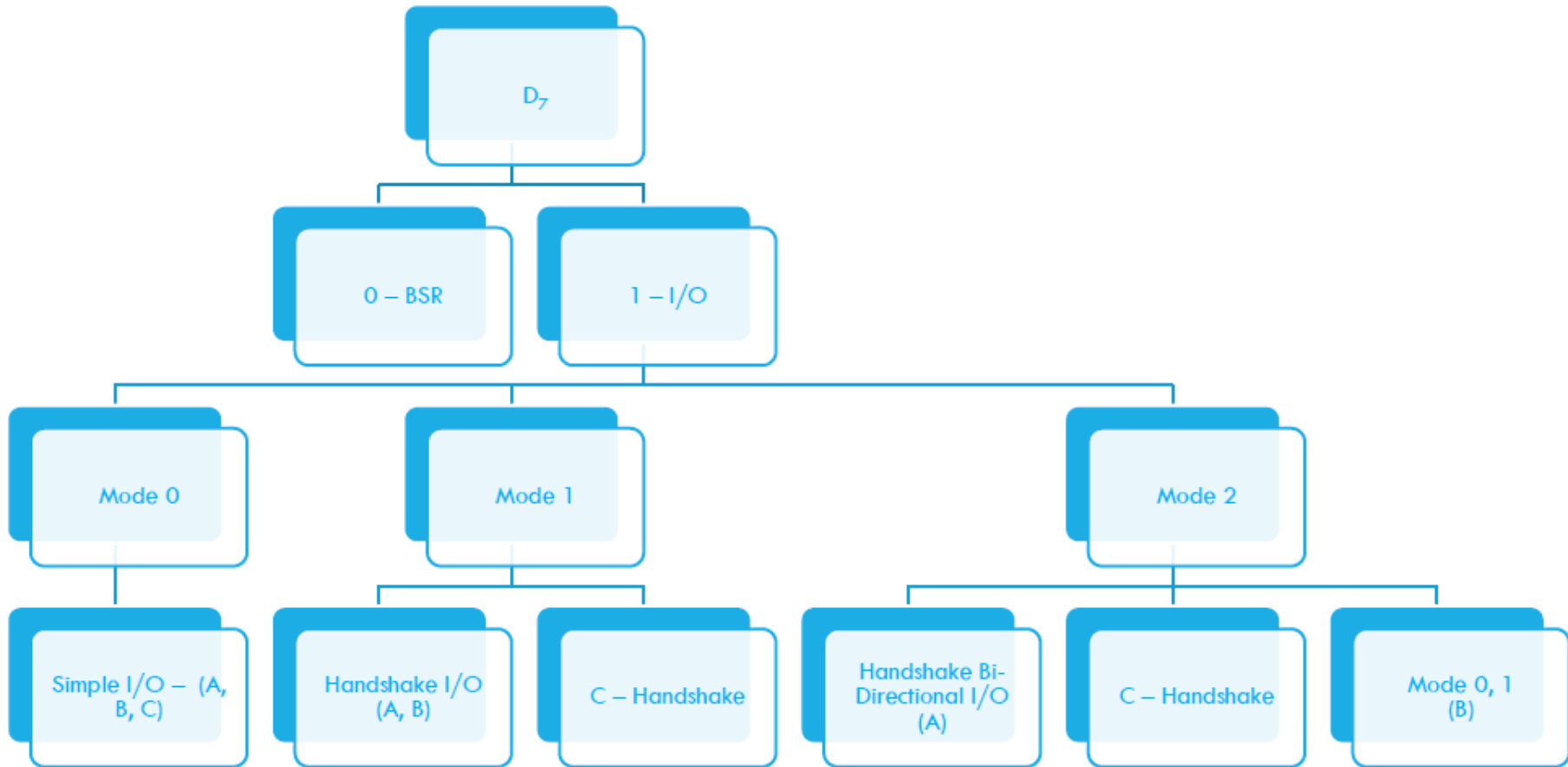
8255 Programmable Peripheral Interface

Part:2

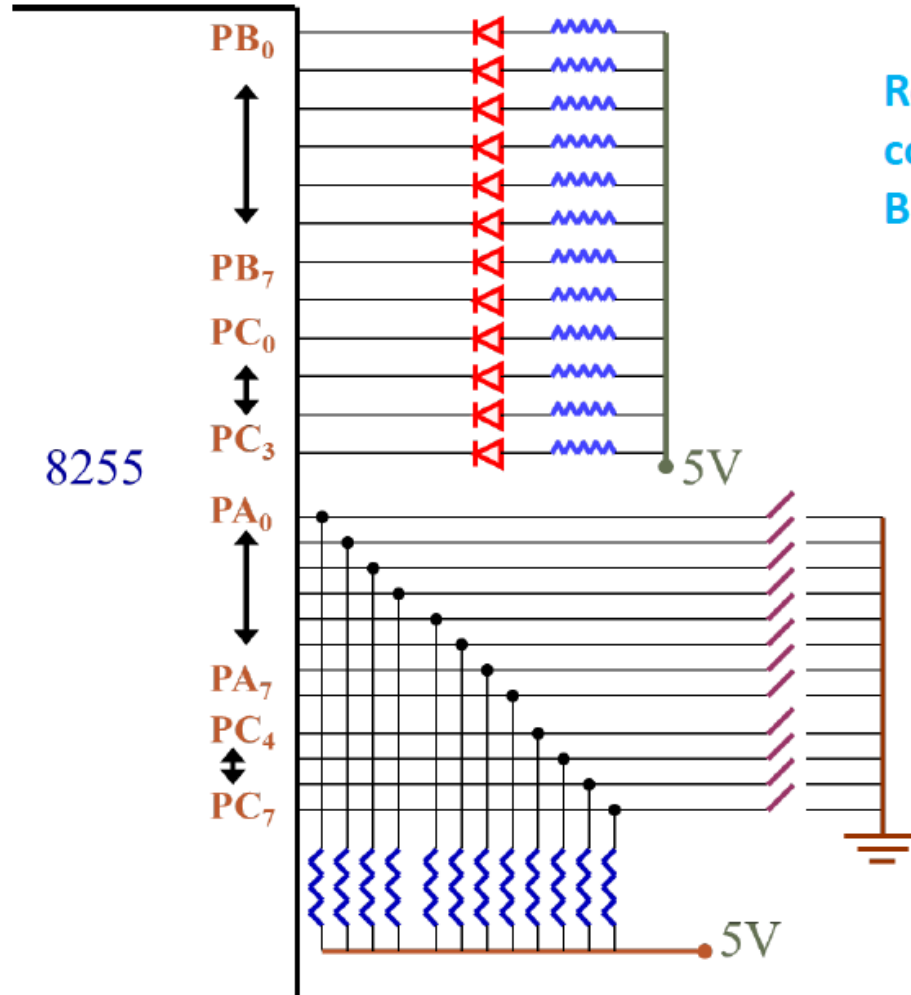
By Dr. Sanjay Vidhyadharan



Modes of operation of 8255



Example



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

Example

in

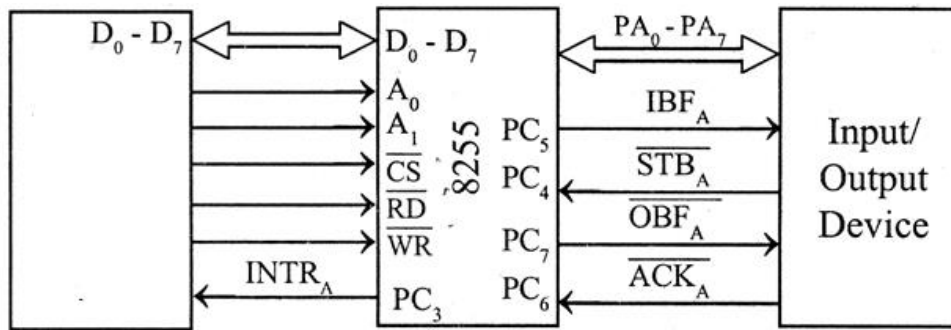
```

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
    
```

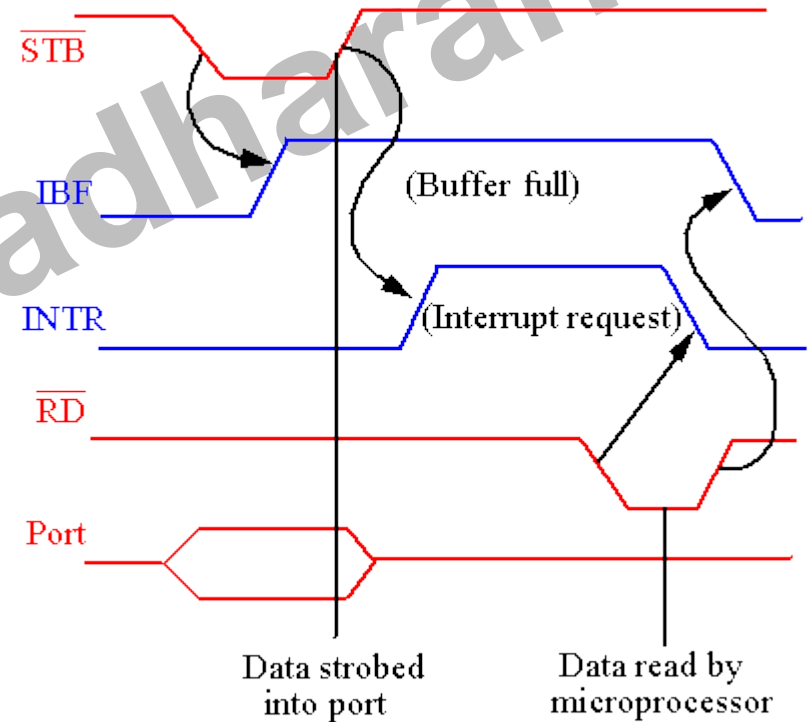
D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
	Port A Mode		Port A	Port C Upper	Port B Mode	Port B	Port C Lower
Always 1 for I/O Mode	0 0 - Mode 0 0 1 - Mode 1 1 x - Mode 2		1 - I/P 0 - O/P	1 - I/P 0 - O/P	0 - Mode 0 1 - Mode 1	1 - I/P 0 - O/P	1 - I/P 0 - O/P
	Group A				Group B		

Handshaking signal

Input Read

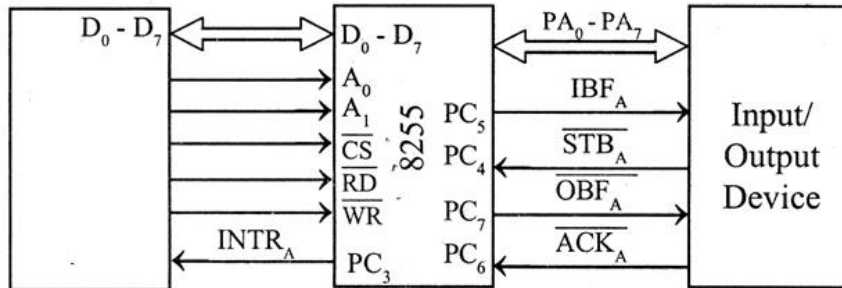


Timing Diagram

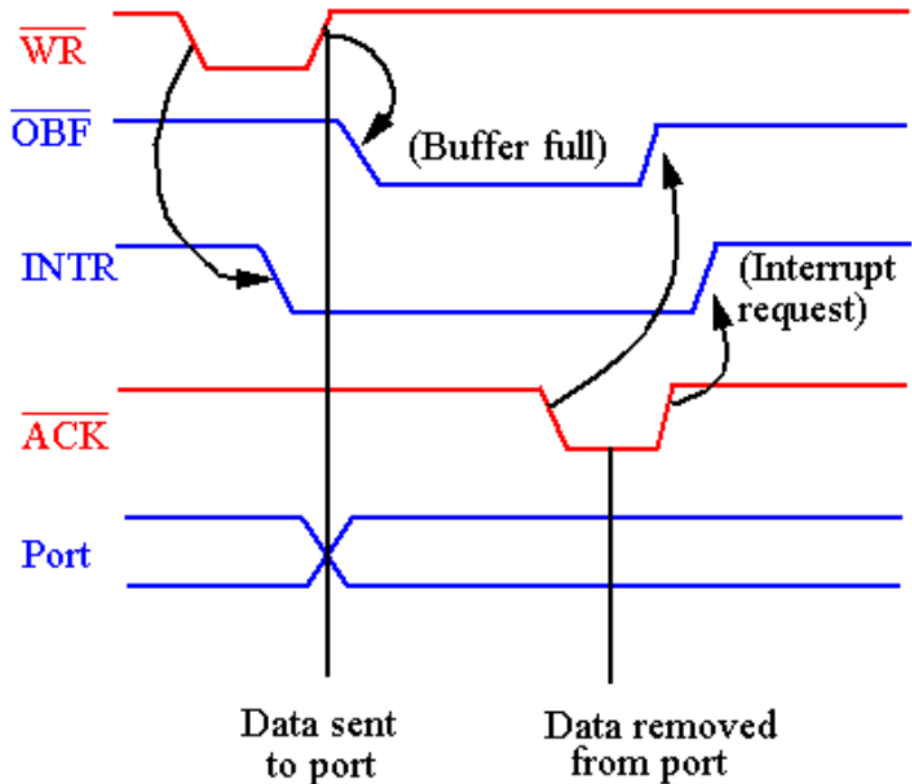


Handshaking signal

Output Write



Timing Diagram



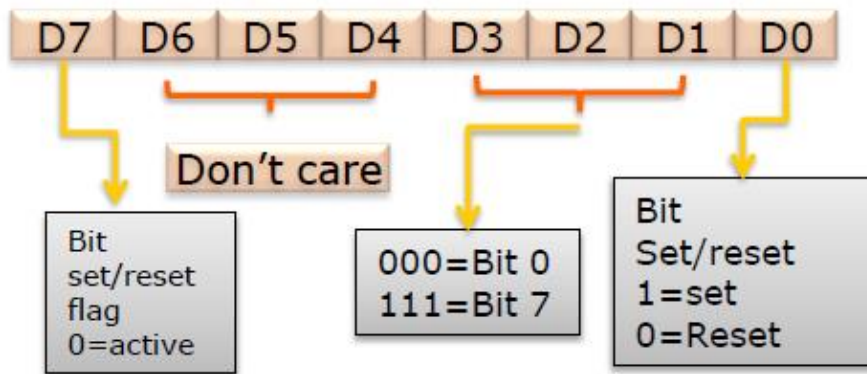
MODE 1 (Strobed I/O mode)

- 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.

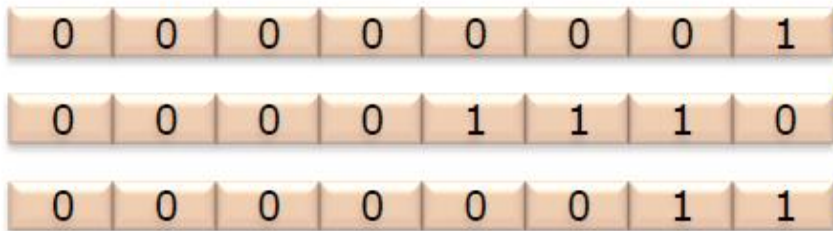
MODE 2 (Strobed Bidirectional I/O mode)

- 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



Write the BSR control words for
i) PC0 to be set
ii) PC7 to be reset
iii) PC1 to be set



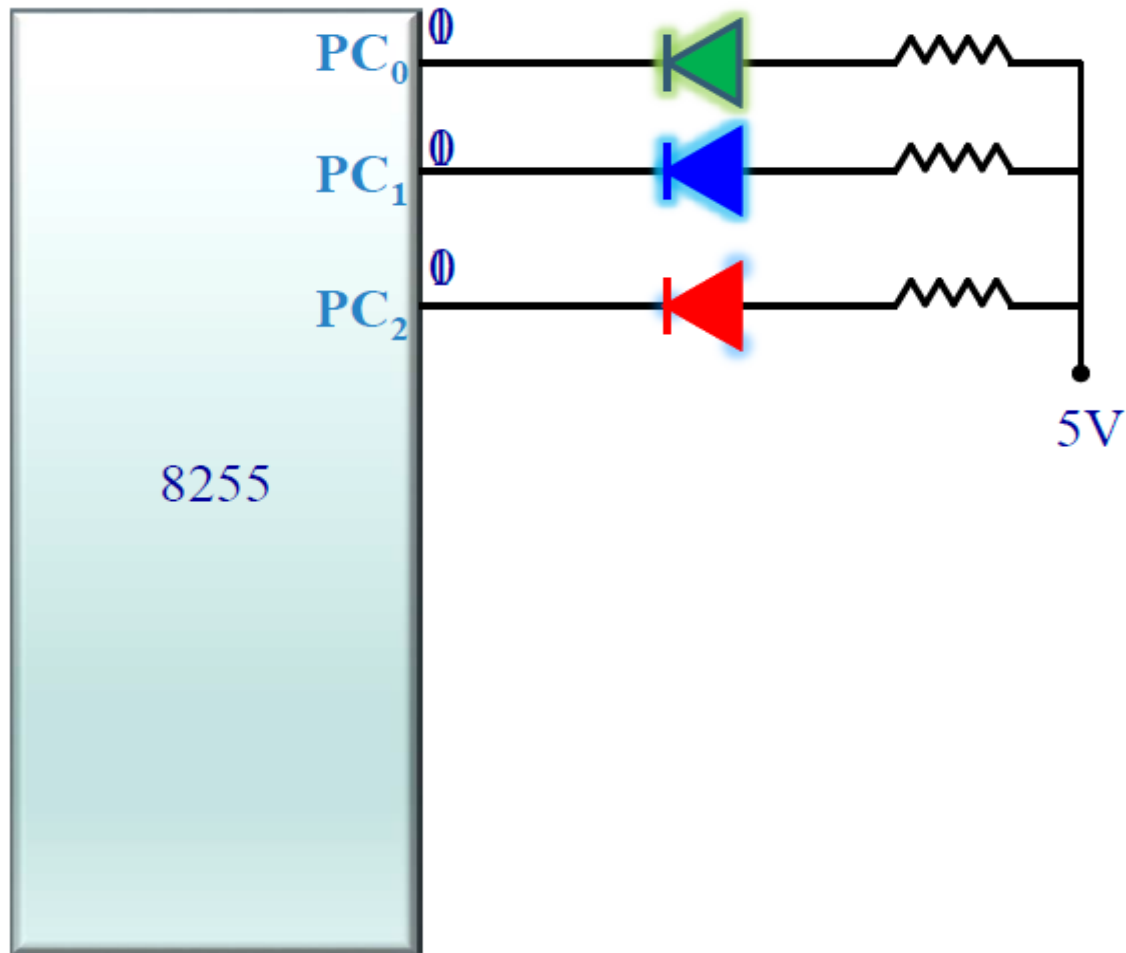
Example

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

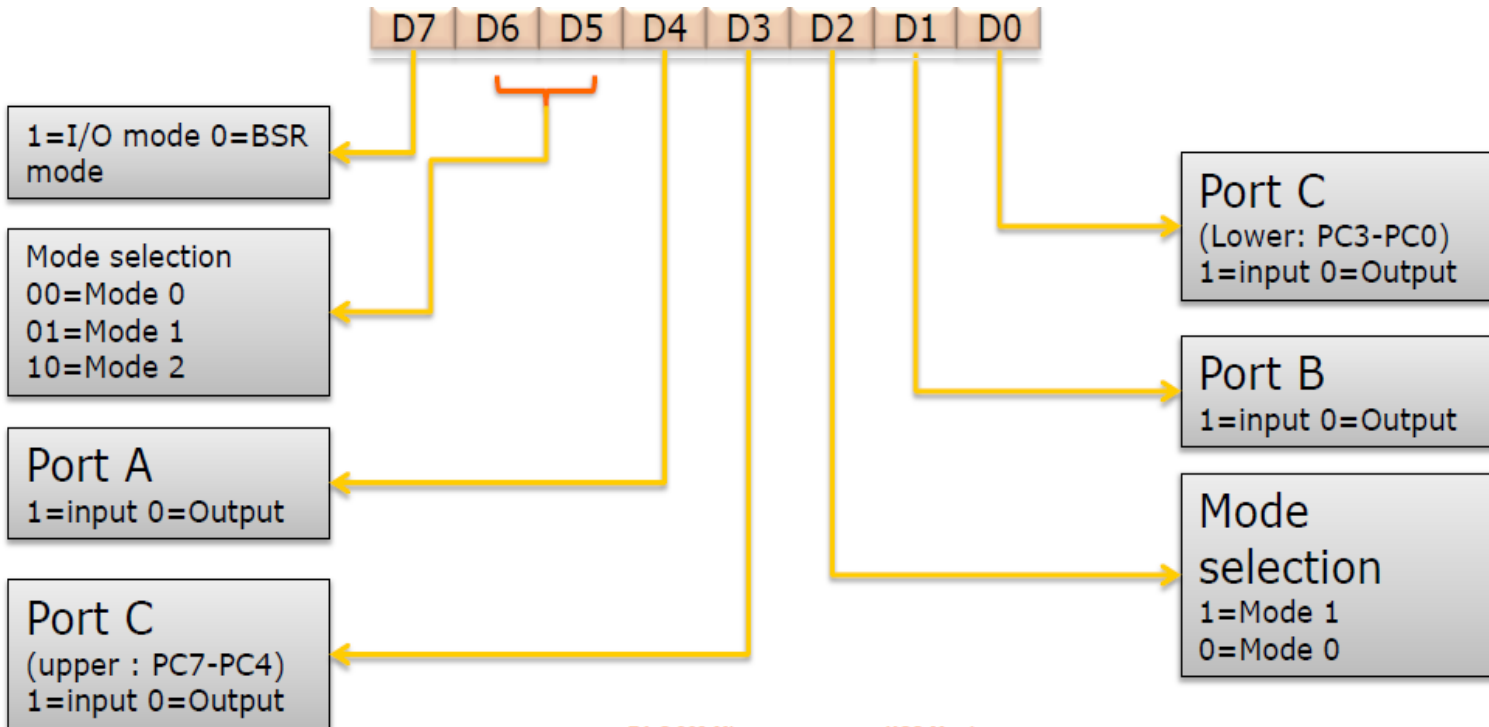
8255- Base address 00_H

Sanjayvidny

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	1 - Set 0 - Reset
				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	

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
```

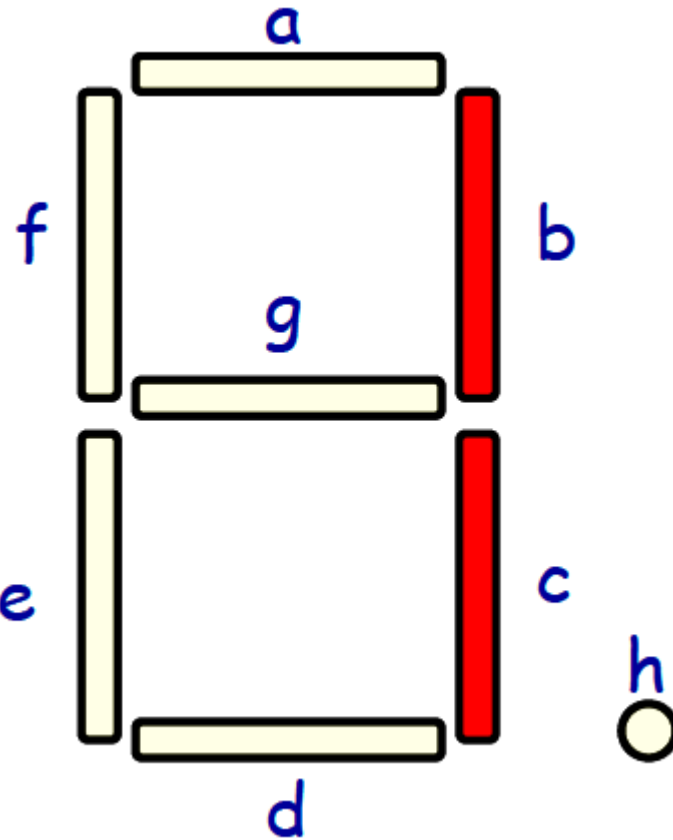
```
MOV AL, 01H
OUT CR, AL
MOV AL, 03H
OUT CR, AL
MOV AL, 04H
OUT CR, AL
```

```
CALL delay_1ms
```

```
JUMP REPEAT
```

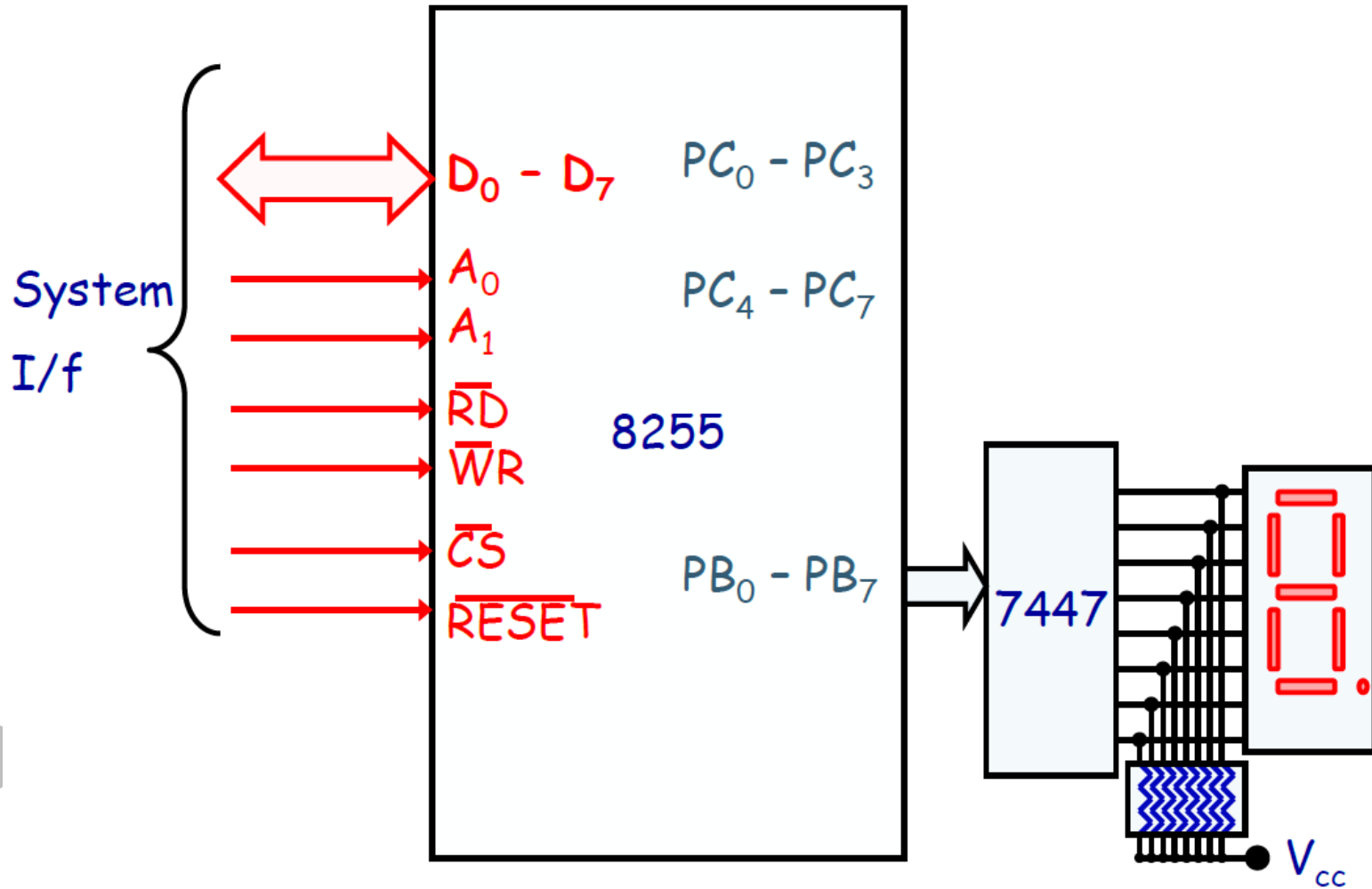
```
DELAY PROC NEAR
        MOV CX, 0EEH
HERE:   NOP
        LOOP HERE
        END
```

Display Interfacing



Display Interfacing

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Thank You