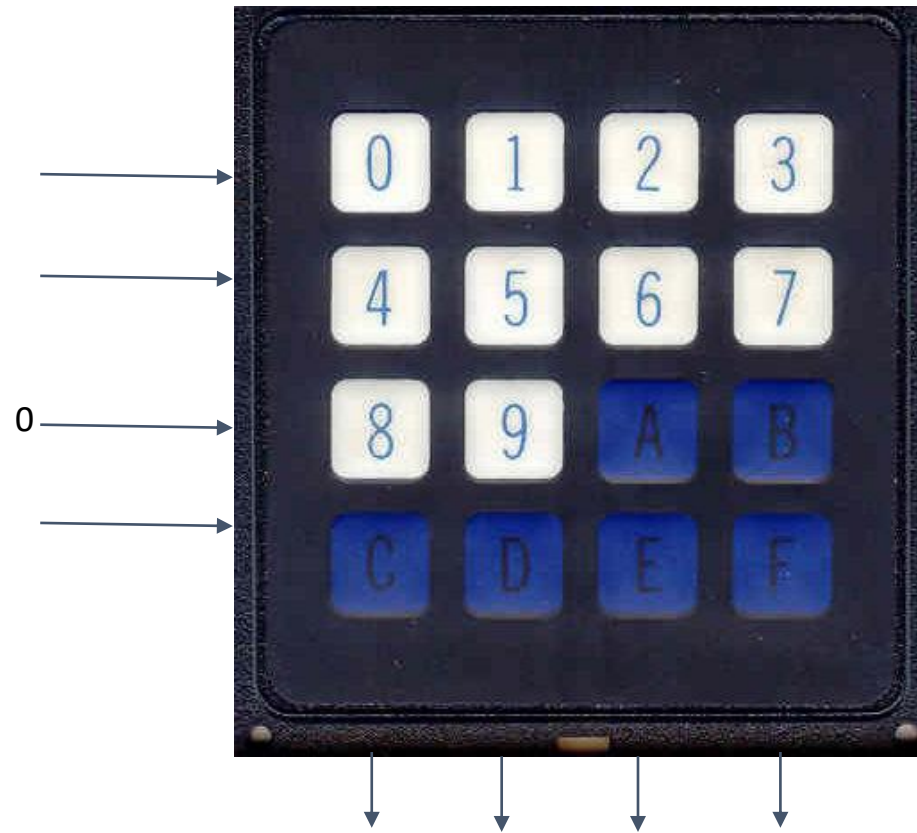


CSE360-Computer Interfacing

BRAC University

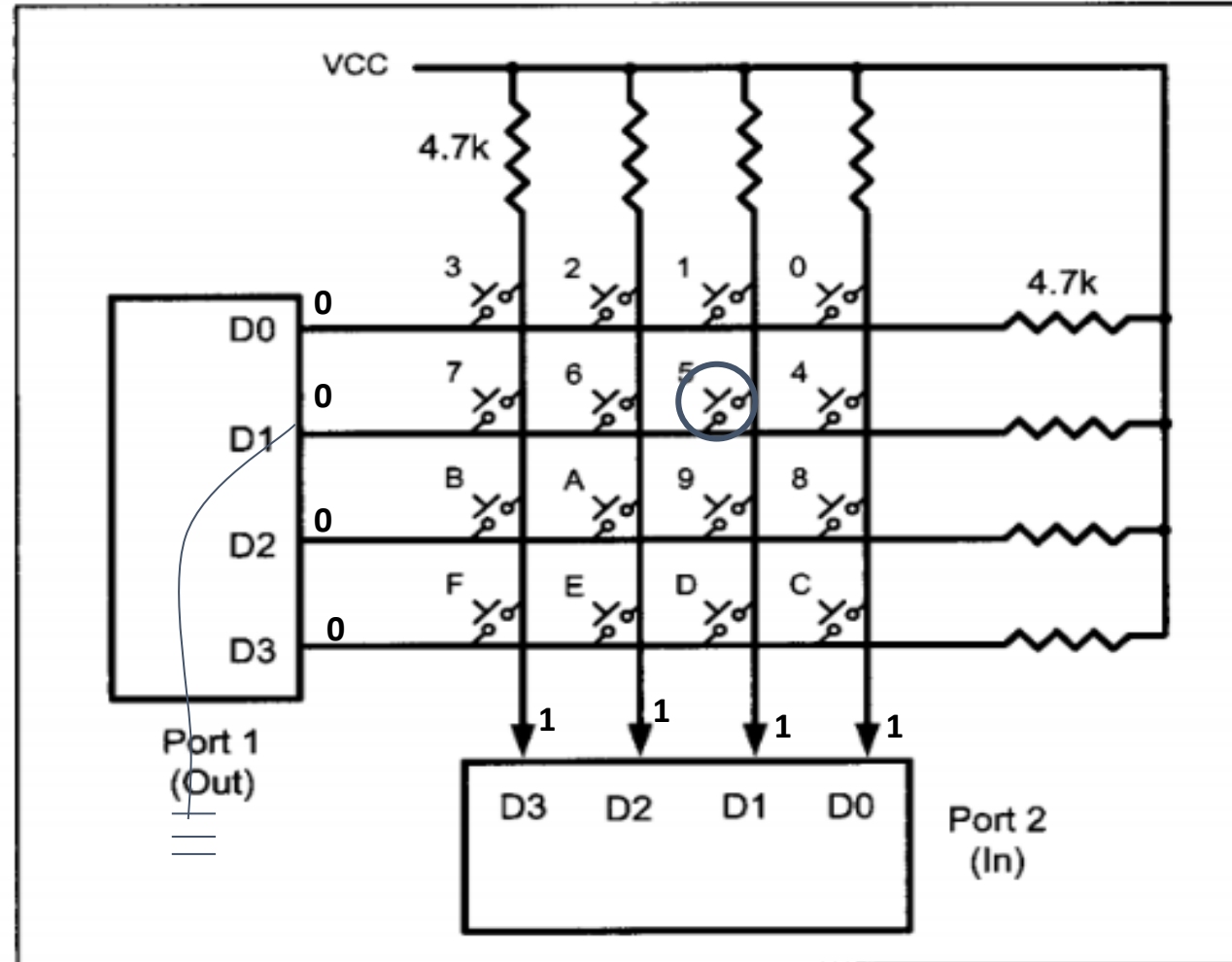
Keyboard Interfacing with MPU through 8255 PPI



Hex Keyboard and 7-segment display



Hex Keyboard Interfacing



Defining Control Register and Ports of 8255

- We know there are four rows

Suppose,

R0 DB 0 1 2 3

R1 DB 4 5 6 7

R2 DB 8 9 0A 0B

R3 DB 0C 0D 0E 0F

KEYPRESSED DB 0

Control Word Register (CWR)							
8				2			
1	0	0	0	0	0	1	0
I/O	MODE 0 PORT A		PORT A Output		MODE 0 PORT B	PORT B Input	

- 8255 control word send to control register

MOV AL, 82H

OUT CWR, AL

Column Identification

Rows are grounded

R0	PA0	0
R1	PA1	0
R2	PA2	0
R3	PA3	0

Columns are connected to VCC

C3	C2	C1	C0
1	1	1	1

3	2	1	0
7	6	5	4
B	A	9	8
F	E	D	C

1	1	1	1
PB3	PB2	PB1	PB0

```

MOV AL, 0
OUT PA, AL
IN AL, PB
CMP AL, 0FH
JZ KEYPRESS
CALL DELAY

```

Column Identification

R0	PA0	0
R1	PA1	0
R2	PA2	0
R3	PA3	0

C3	C2	C1	C0
1	1	1	1

KEYPRESS:

3	2	1	0
7	6	5	4
B	A	9	8
F	E	D	C

1	1	0	1
PB3	PB2	PB1	PB0

```

MOV AL, 0
OUT PA, AL
IN AL, PB
CMP AL, 0FH
JZ KEYPRESS
CALL DELAY

```

0FH = 1111

Row Identification – R0

R0	PA0	0
R1	PA1	1
R2	PA2	1
R3	PA3	1

C3	C2	C1	C0
1	1	1	1

3	2	1	0
7	6	5	4
B	A	9	8
F	E	D	C

1	1	1	1
PB3	PB2	PB1	PB0

R0:
MOV AL, 1110
OUT PA, AL
IN AL, PB
CMP AL, 0FH
JZ R1
LEA SI, R0
JMP COL

Row Identification – R1

R0	PA0	1
R1	PA1	0
R2	PA2	1
R3	PA3	1

C3	C2	C1	C0
1	1	1	1

3	2	1	0
7	6	5	4
B	A	9	8
F	E	D	C

1	1	1	1
PB3	PB2	PB1	PB0

R1:
MOV AL, 1101
OUT PA, AL
IN AL, PB
CMP AL, 0FH
JZ R2
LEA SI, R1
JMP COL

Row Identification – R2

R0	PA0	1
R1	PA1	1
R2	PA2	0
R3	PA3	1

C3	C2	C1	C0
1	1	1	1

3	2	1	0
7	6	5	4
B	A	9	8
F	E	D	C

1	1	0	1
PB3	PB2	PB1	PB0

R2:
MOV AL, 1011
OUT PA, AL
IN AL, PB
CMP AL, 0FH
JZ R3
LEA SI, R2
JMP COL

Row Identification – R3

R0	PA0	1
R1	PA1	1
R2	PA2	1
R3	PA3	0

C3	C2	C1	C0
1	1	1	1

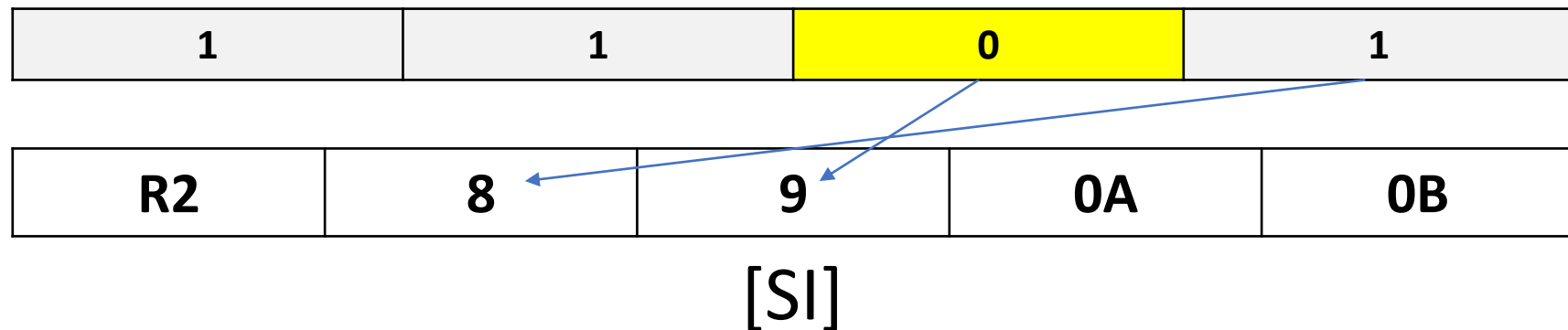
3	2	1	0
7	6	5	4
B	A	9	8
F	E	D	C

1	1	1	1
PB3	PB2	PB1	PB0

R3:
MOV AL, 0111
OUT PA, AL
IN AL, PB
CMP AL, 0FH
JZ R1
LEA SI, R3
JMP COL

Key Press Identification

- We got the value of column 1101 from Row 2 (R2)
- Now we have to find the 0 by shift right (SHR) operation to find out the corresponding value and store that into KEYPRESS variable.
- `MOV AL, [SI]`
`MOV KEYPRESSED, AL`



Thank You
For Your Attention