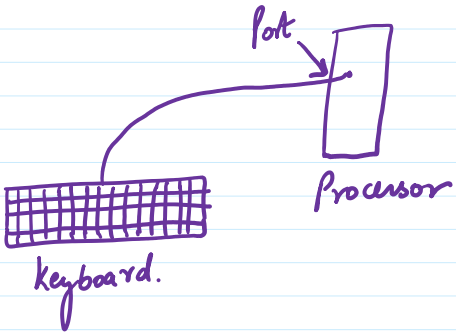
Lecture-25: Input/Output Device Interfacing

01 April 2024 13:14

Keyboard Interfacing :-

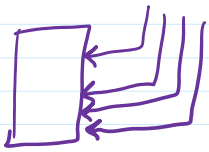


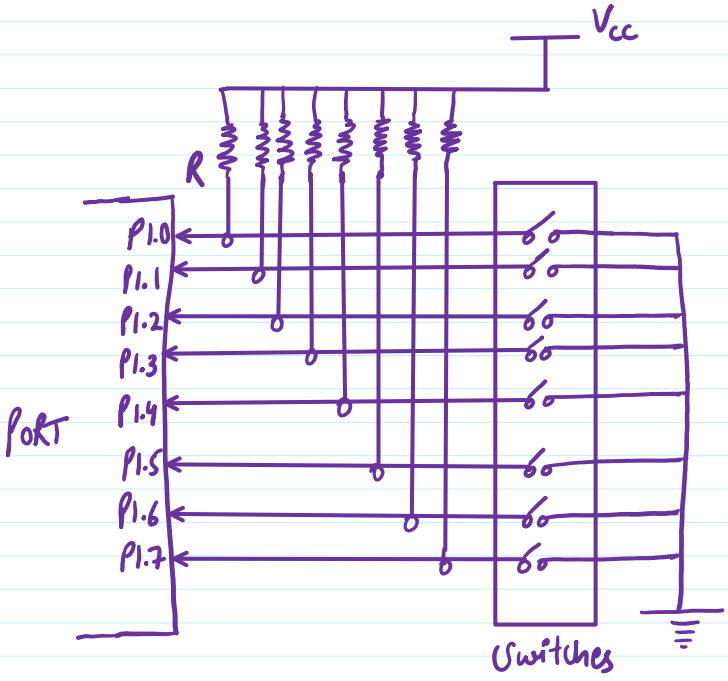
A set of pushbutton keys interfaced to a computer.

Linear v/s Matrix Keybord.

Interfacing of Keyboard Switches :-

① Linear Keyboard :-



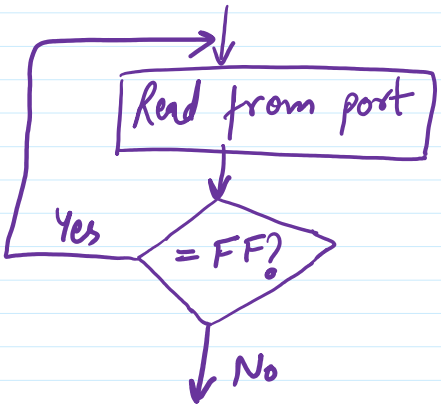


Port ⟵ 8 switches ⟶ ground

⇒ When none of the switch is pressed, connected to a positive voltage which indicates logic 1 through pull up resistances.

⇒ Input is 11111111 = FF

Checking status of transfer (hand shaking)



Check which of the bits is 0 using bitwise and/or operations

↓

Perform operation corresponding to the pressed key

Drawback of Linear Keyboard ⇒ N switches = N ports

② Matrix Keyboard :-

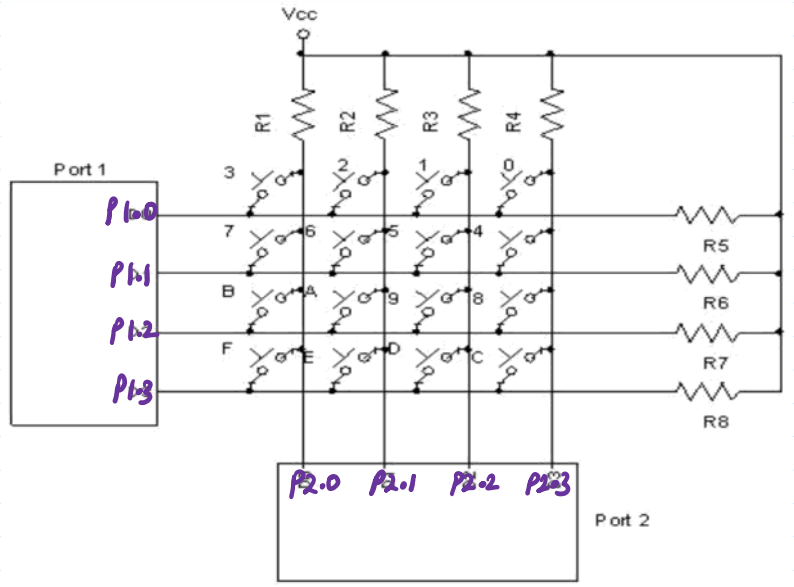
Keys are organized in matrix form.

4x4 = 16 keys = 16 switches

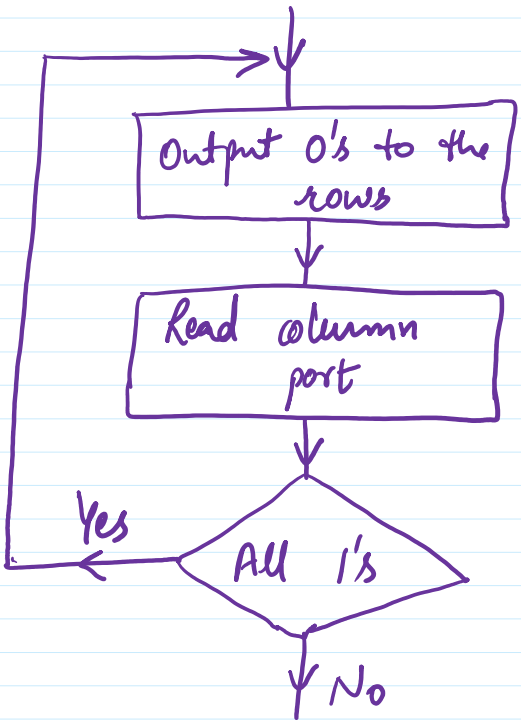
but 8 ports

⇒ Matrix Keyboard N switches = 2√N ports.

used to connect more keys using less number of ports.



Checking status in matrix (hand-shaking)



determine which key is pressed using

Keyboard Scanning.

- One of the rows is made 0 at a time, and column bits are checked.
- Check whether some key in that particular row has been pressed.

How to Interface Keyboard in Interrupt Driven Mode?

Keyboard Scanning