CSE 331 / L-23 / 11.05.2024

Simple I/O:

- No delay. Data transfer ~~emedi~~ immediately
- We just need to turn on the device on switch.

Strobe:

- Delay for data transfer.
- Used for slow responce device.
- Need an enternal signal for data read out.
- When data is ready to read, device send signal to read. This signal known as strobe.

⇒ Polling:
microprocessor cheak ~~ta~~ for strobe signal maintaining a fixed interval.

Interrupt:
Until the device provide the interrupt signal, microprocessor will not check for strobe.

Hand-shaking I/O:

Limited range of data first transfer to Peripheral Interface device. When the device is full, it will send microprocessor to read data. And warn the I/O device not to send new data.

IBF = Input Buffer Full

- given to the I/O device to warn that buffer is full, don't send new data.

INT = Interrupt

- given to microprocessor to read data.

STB =

IBF = INT = ~~same~~ generate at the same time.

OBF = Output Buffer Full

Ack = acknowledgement that data ~~is read done.~~ output done.

8255A / PPI

Programable Peripheral Interface

* Total 4 Port ⇒ 3 for peripheral, PA, PB, PC

1 for data, $D_0 - D_7$

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A_2 A_1 ⇒ Control Pin.

✱ BSR = Bit Set Reset ($D_7 = 0$)

⇒ Port C used for set and reset.
we use it for strobe signal.

$D_3 - D_1$ ⇒ Decide the bit number

000 = PC_0
001 = PC_1
⋮

$D_7 - D_0$ ⇒ 0 ⇒ Reset
1 ⇒ Set

Mode - 0 ⇒ simple I/O
Mode - 1 ⇒ Strobe
Mode - 2 ⇒ Handshake

✱ Step

1. Look at the circuit carefully.
   - ~~find out~~ Detect the ✱ I/O transfer mode
     - simple
     - strobe
     - handshake
   - Determine the data for control Register

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
1	0	0	0	x	x	x	x
				1	0	1	1
8				B			

2. Set the require address for Port and selection

A_7	A_6	A_5	A_4	A_3	A_2	A_1	A_0
↓	↓	↓	↓	↓	↓	↓	↓
G	G2B	C	B	A	A_1	A_0	G2A
1	0	0	0	0	1	1	0

8 6 ⇒ For control Register

CR ⇒ 86 H
PA ⇒ 80 H
PB ⇒ 82 H
PC ⇒ 84 H

Can be changed, depends on pin connection of microprocessor address pin.

3. Write Required Code

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B/$\overline{C}$
↓ Blank
$PC_0 = 1$
→ Convert
$PC_0 = 0$

For this pulse

$D_7 - D_0$

$0\times\times\times$ 0001 ⇒ 01 H = PC_0 set
00 H = PC_0 Reset

For I/O Mode

$D_7 - D_0$
1011 11x0 = BC H
B C

PC_7 = strobe signal

0 = Data Ready

1 = Not Ready

From PC

P_7 — — P_0

1 000 ... 0

AND = $P_7 = 0$

AND = 0

$P_7 = 1$

AND = 1 0

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Question Pattern:

Microprocessor address will be changed

- So look carefully at the circuit.

Port connection maybe changed.

So generate the address and control value carefully.

Then implement the code.