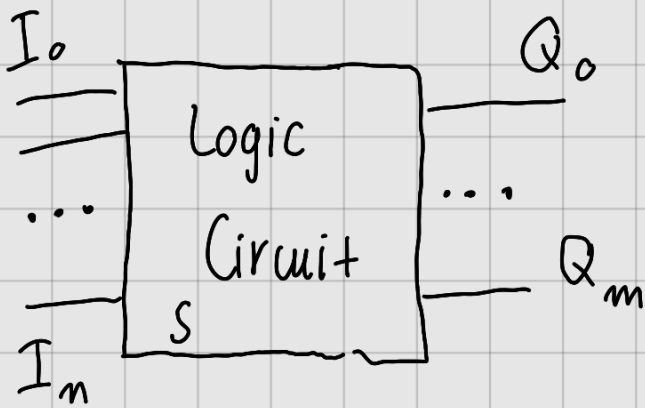


Combinational Logic circuit



$$Q_{it} = f_i(I_{0t}, I_{1t}, \dots, I_{nt})$$

Sequential Logic circuit

$$Q_{it} = f_i(I_{0t}, I_{1t}, \dots, I_{nt}, S)$$

Active and Non-active

- Active : Input is affected

0 \rightarrow Low active input
1 \rightarrow High active input

Output is working

0 \rightarrow Low active output
1 \rightarrow High active output

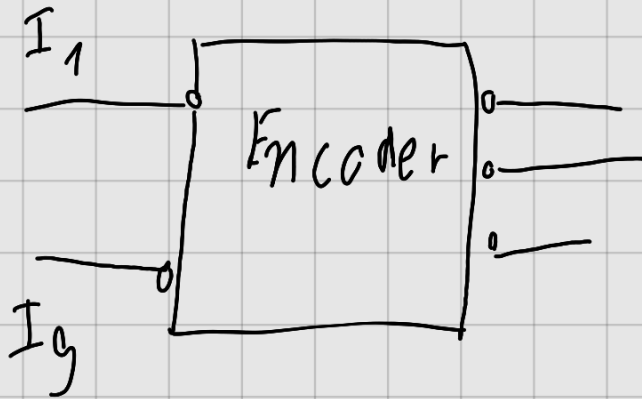
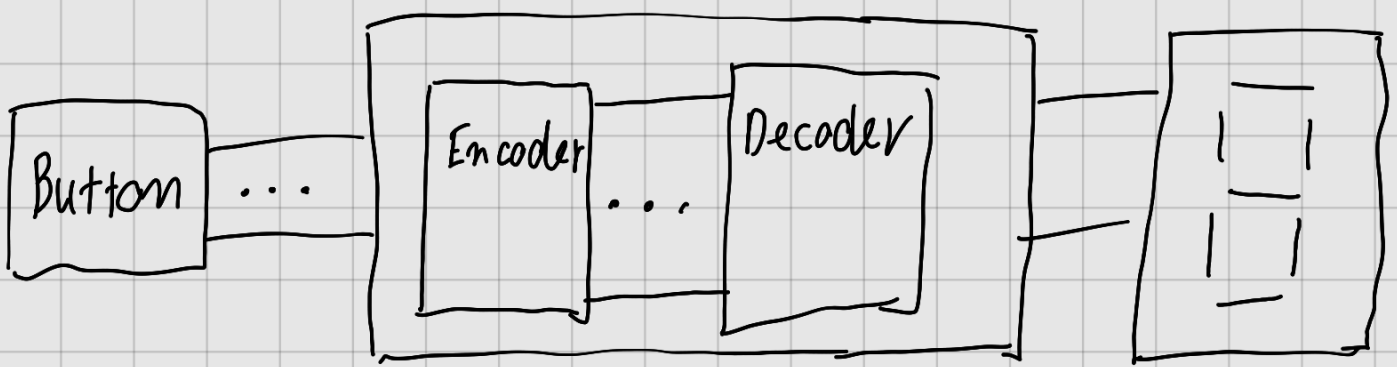
MSI \rightarrow Encoder

IC Decoder \rightarrow Design CLC

MUX

DEMUX

Arithmetic Circuit (Adder, ...)



+) Button 1-9 press \rightarrow output
BCD 1-9

+) Input low active
 Output Inversion of BCD

Priority: highest number input

2⁹

I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9	D	C	B	A	
1	1	1	1	1	1	1	1	1	1	1	1	1	\Rightarrow "0"
X	X	X	X	X	X	X	X	0	0	1	1	0	\Rightarrow "9"
X	X	X	X	X	X	X	0	1	0	1	1	1	\Rightarrow "8"
X	X	X	X	X	X	0	1	1	1	0	0	0	\Rightarrow "7"
X	X	X	X	X	0	1	1	1	1	0	0	1	\Rightarrow "6"
X	X	X	X	0	1	1	1	1	1	0	1	0	\Rightarrow "5"
X	X	X	0	1	1	1	1	1	1	0	1	1	\Rightarrow "4"
X	X	0	1	1	1	1	1	1	1	1	0	0	\Rightarrow "3"
X	0	1	1	1	1	1	1	1	1	1	0	1	\Rightarrow "2"

$$0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 0 \Rightarrow "1"$$

$$D = I_9 (I_8 + \overline{I_9})$$

$$C = (I_7 + \overline{I_8} + \overline{I_9}) (\overline{I_6} + \overline{I_7} + \overline{I_8} + \overline{I_9})$$

$$(I_5 + \overline{I_6} + \overline{I_7} + \overline{I_9}) (I_4 + \overline{I_5} + \overline{I_6} + \overline{I_7} + \overline{I_8} + \overline{I_9})$$