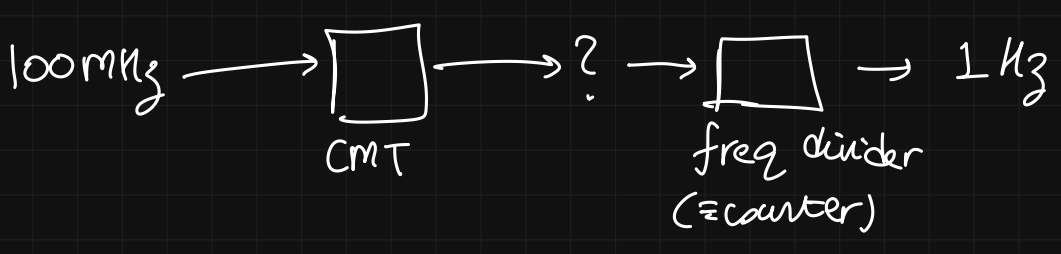


x should be > 4MHz (CMT's constraint)

$$\frac{[\text{CMT output}]}{2^n} = [\text{intended o/p}]$$

n: size of frequency divider

to achieve: 3Hz →

$$100MHz \xrightarrow{CMT} x > 4MHz \xrightarrow[\text{div.}]{\text{freq.}} 3Hz$$

$$\frac{x}{2^n} = 3 \Rightarrow x = 3 \times 2^n$$

and $x > 4MHz$

let $x = 6MHz$

then $6 \times 10^6 = 3 \times 2^n$

$$2 \times 10^6 = 2^n$$

$$10^6 = 2^{n-1}$$

$$\log_{10} 10^6 = n-1 \log_{10} 2$$

$$6 = n-1 \cdot \log_{10} 2$$

$$6 = (n-1)\ 0.3$$

$$n-1 = 20 \simeq 21 \text{ bits}$$

vector: reg [2:0] something = 3'b111;

memory: reg [2:0] else [255:0];

a	b	a&&b	a||b	a&&!b	a||!b
0	1	0	1	0/F	1/T
000	000	000	000	0/F	0/F
000	001	000	001	0/F	1/T
011	001	001	011	1/T	1/T

if any of the bits of the output of bitwise operator is 1 ⇒ then logical operator output = 1 (TRUE)
else: 0 (FALSE)

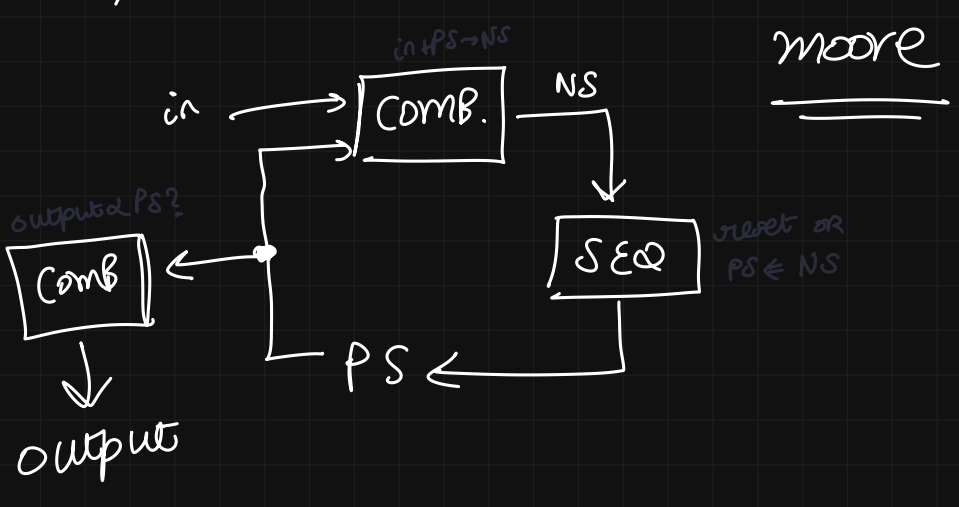
$$100MHz \xrightarrow{CMT} 8.388MHz \xrightarrow{23} 1$$

$$\frac{2}{2} \times \frac{8.388}{2^{23}} = 1$$

$$\frac{16.677}{2^{24}} = 1$$

So, 24 bits required now

in, PS, NS, output



do not initialize the output of a combinational circuit or else the tool might ignore it

(switch) case — if/else

parallel execution — serial execution

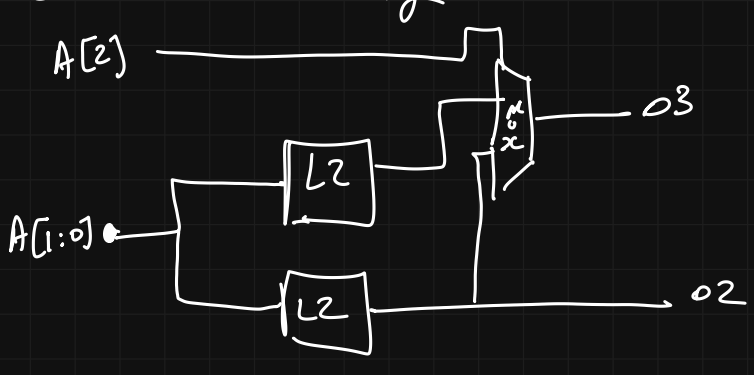
↳ full case: mutually exhaustive
↳ parallel case: mutually exclusive

note: ? : verilog :: _ : dart

blocking → combinational — always@*

non-blocking → sequential — always@(posedge clk)

values in RHS of an always block are stored at the (...) condition in case of non-blocking



1 × 3 input comb. ckts — 3≤3, 1≤2, 0≤0

2 × 2 input comb ckts — 3≤3 2≤2 / 2≤3 2≤2

f(A,B)
f(B,C)

sequential = comb + memory