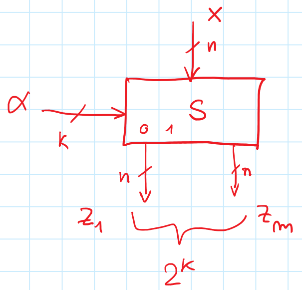
RETI COMBINATORIE

lunedì 2 ottobre 2017 09:11

SELEZIONATORE

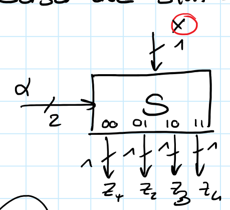


$\alpha = 0 \quad \begin{cases} z_1 = x \\ z_i \ (i \neq 1) = 0 \end{cases}$

$\alpha = 1 \quad \begin{cases} z_2 = x \\ z_i \ (i \neq 2) = 0 \end{cases}$

$\alpha = 2 \quad \begin{cases} z_3 = x \\ z_i \ (i \neq 3) = 0 \end{cases}$

Caso da sintetizzare



Passo 1 (def)

Passo 2 TAB VERITÀ

$8 = 2^3$

α_1	α_2	x	z_1	z_2	z_3	z_4
0	0	0	0	0	0	0
0	0	1	1	0	0	0
0	1	0	0	0	0	0
0	1	1	0	1	0	0
1	0	0	0	0	0	0
1	0	1	0	0	1	0
1	1	0	0	0	0	0
1	1	1	0	0	0	1

PASSO 3

(somma di prodotti ∀ delle uscite)

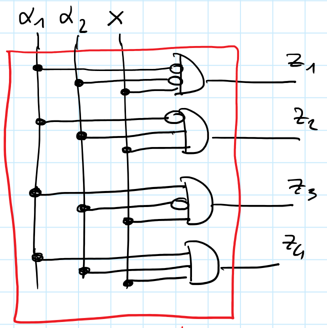
$z_1 = \bar{\alpha}_1 \bar{\alpha}_2 x$

$z_2 = \bar{\alpha}_1 \alpha_2 x$

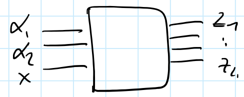
$z_3 = \alpha_1 \bar{\alpha}_2 x$

$z_4 = \alpha_1 \alpha_2 x$

PASSO 4 (porte logiche AND / OR / NOT)



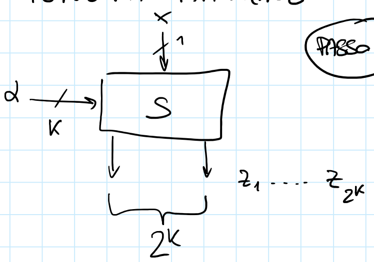
Passo 5



?tp

1tp

GENERALIZZAZIONE



PASSO 1

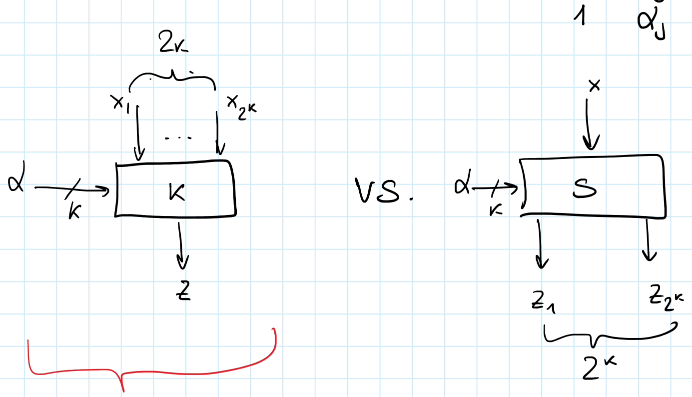
$z_i = \overline{\alpha_1 \alpha_2 \dots \alpha_k} \, x$ PASSO 3 PASSO 5

traduzione in binari di "i"

in corrispondenza di 0 $\bar{\alpha}_j$

1 α_j

$\lceil \log_8 (k+1) \rceil * tp$



TAB VER

$\overbrace{x_i}^{2^k \text{ numeri}}$	$\overbrace{\alpha}^{k}$	z
-- x_x ---	α_x	

livello AND → } + "1"

$\overbrace{\alpha}^{k}$	$\overbrace{x}^{1}$	$z_1 \dots z_{2^k}$
		1 ogni colonna

livello AND $\longrightarrow$ $- - - x_x - - - \alpha_x$ + "1"

k valori x α + 1 valore x χ

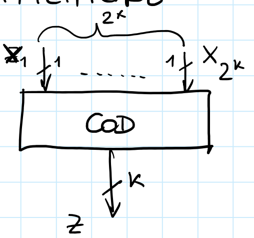
1 ogni colonna ha 1 solo 1

$\underbrace{\qquad\qquad}_{k+1}$

livello AND

è uguale (in termini di ritardo introdotto)

CODIFICATORE



Z è la configurazione di bit che mi dice qual'è il numero dell'ingresso a 1 unico

TAB VERITÀ $k = 2$ $x_0\ x_1\ x_2\ x_3$

$z_1 z_2$

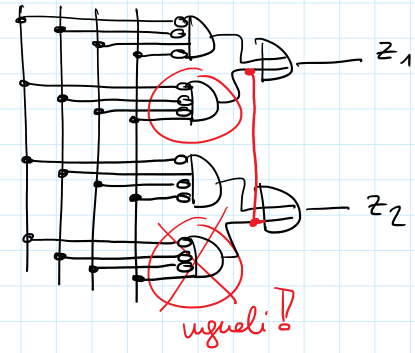
solo le righe x che

x_0	x_1	x_2	x_3	z_1	z_2
1	0	0	0	0	0
0	1	0	0	0	1
0	0	1	0	1	0
0	0	0	1	1	1

$$z_1 = \bar{x}_0 \bar{x}_1 x_2 \bar{x}_3 + \bar{x}_0 \bar{x}_1 \bar{x}_2 x_3$$

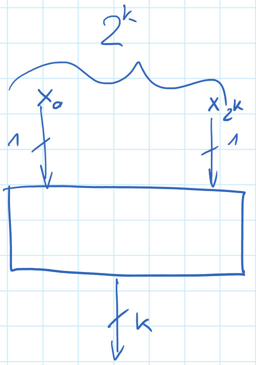
$$z_2 = \bar{x}_0 x_1 \bar{x}_2 \bar{x}_3 + \bar{x}_0 \bar{x}_1 \bar{x}_2 x_3$$

$x_1\ x_2\ x_3\ x_4$



$1t_p + 1t_p$
AND OR

$2t_p$



indice del 1° ingresso (da x_0 in poi →) diverso da ϕ

$k = 2$

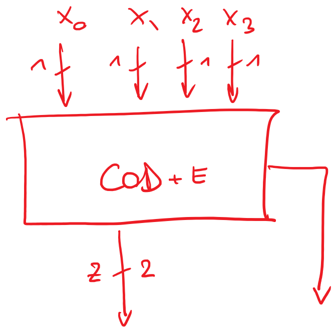
x_0	x_1	x_2	x_3	z_1	z_2
1	–	–	–	0	0
0	1	–	–	0	1
0	0	1	–	1	0
0	0	0	1	1	1

$$z_1 = \bar{x}_0 \bar{x}_1 x_2 + \bar{x}_0 \bar{x}_1 \bar{x}_2 x_3$$

$$z_2 = \bar{x}_0 x_1 + \bar{x}_0 \bar{x}_1 \bar{x}_2 x_3$$

x_0	x_1	x_2	x_3	z_1	z_2
1	0	0	0	0	0
0	1	0	0	0	1
0	0	1	0	1	0
0	0	0	1	1	1

$z_1 = x_2 + x_3$



E $\begin{cases} 0 & \text{uscita ok} \\ 1 & \text{conf non valida} \end{cases}$

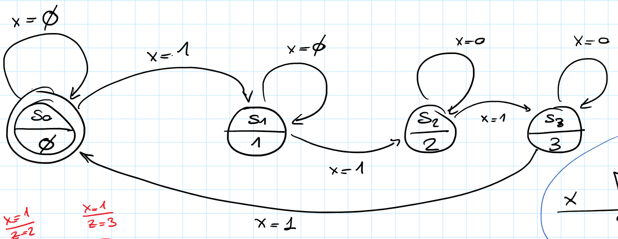
2^4

x_0	x_1	x_2	x_3	z_1 z_2	E
0	0	0	0	O	1
0	0	0	1	1 1	0
0	0	1	0	1 0	0
0	0	1	1	O	1
0	1	0	0	0 1	0
0	1	0	1		
0	1	1	0	O	1
0	1	1	1		
1	0	0	0	0 0	0
1	0	0	1		
1	0	1	0		
1	0	1	1	O	1
1	1	0	0		
1	1	0	1		
1	1	1	0		
1	1	1	1		

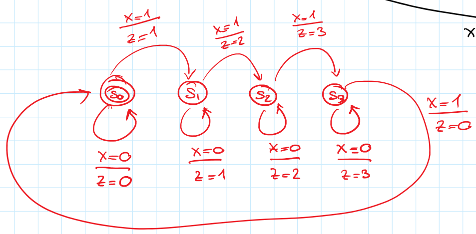
Reti sequenziali

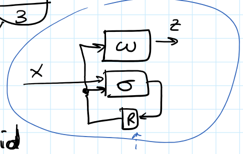
rete seq che conta il numero di "1" (su un ingresso da 1 bit) modulo 4

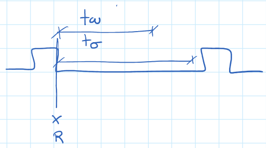
Automa di Moore



Mealy

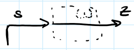






$S_0 = 00$
$S_1 = 01$
$S_2 = 10$
$S_3 = 11$

ω = id



x	$s_1\ s_2$	$s_1'\ s_2'$
0	00	00
1	00	01
0	01	01
1	01	10
0	10	10
1	10	11
0	11	11
1	11	00

00
01
01

10
01
11

$s_1' = x\bar{s}_1 s_2 + \bar{x} s_1 \bar{s}_2 + x s_1 \bar{s}_2 + \bar{x} s_1 s_2$ 2tp

$s_1\bar{s}_2(\cancel{x+\bar{x}})$ 1

$s_1' = x\bar{s}_1 s_2 + s_1\bar{s}_2 + \bar{x} s_1 s_2$

s_2' 4 termini da 3 ingressi
PORTE AND da 3
PORTE OR da 4 ingressi
2tp

$t_\omega = id \Rightarrow \emptyset tp$

$t_\sigma \Rightarrow 2tp$

$\tau = \max\{t_\omega + t_\sigma\} + \delta$
$\quad\; 0 \quad\; 2tp \quad\; 1tp$
$= 3tp$

Stessa rete seq ma con componenti standard

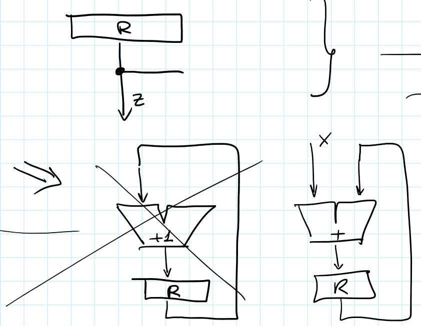
"ω usata è l'identità"

⇒

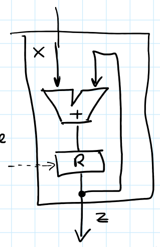
"stato interno successivo il risultato di una op di incremento di 1"

sse x = 1

⇒

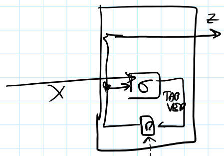


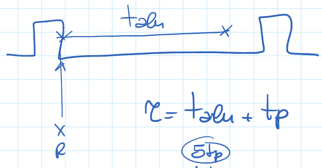
insieme



τ ?

=

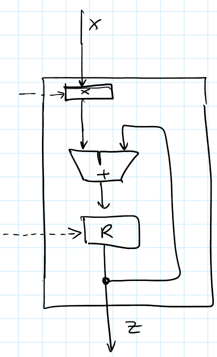


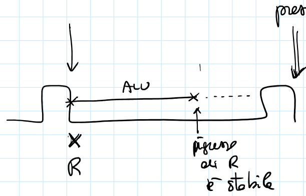


$\tau = t_{alu} + tp$

5tp
10tp

prossima variaz. di x

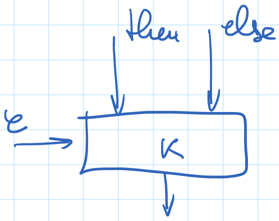


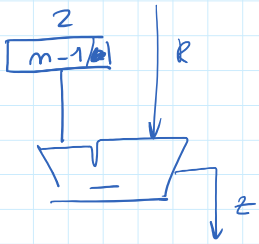


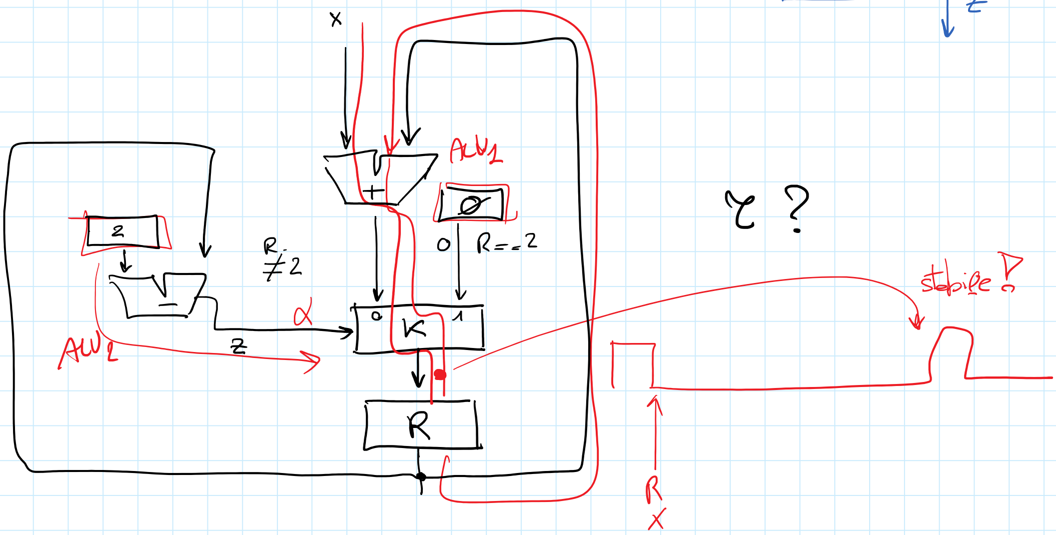
Contatore di "1" nell'ingresso da 1 bit modulo 3

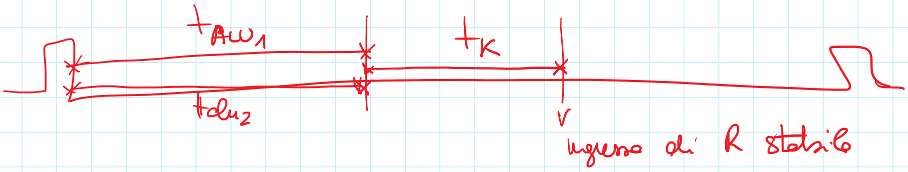
con componenti standard

if C then else









δ

$\tau = t_{alu} + t_K + t_p$