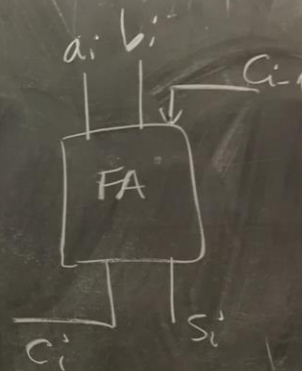
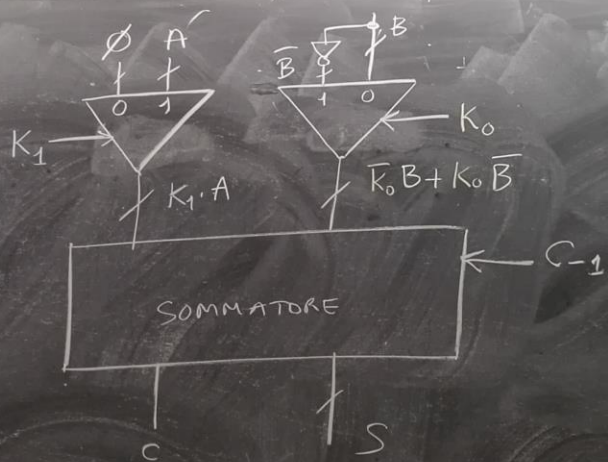


ALU
(Arithmetic-Logic Unit)





Segnali di Controllo

K_1	K_0	C_{-1}
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	1	1

operazione

$S = 0 + B + 0 = B$
$S = B + 1$
$S = \bar{B}$
$S = \bar{B} + 1 = -B$
$S = A + B$
$S = A + \bar{B} + 1 = A - B$

Note

- selezione di B
- incremento di B
- complemento (a 1) di B
- cambio del segno di B
- somma
- sottrazione

2

zione di B

mento di B

mento (a 1) di B

bio del segno di B

mma

sottrazione

1000

representare in C_2

$\neq$

calcolare il C_2

$$C_2(0110) = 1001 + 1 = \\ = 1010$$

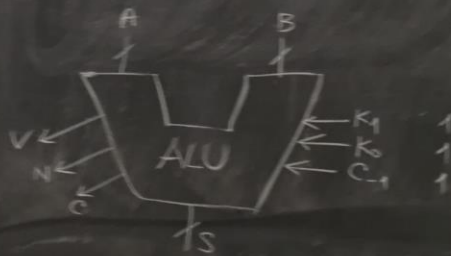
0110
↓ ↓ ↓ ↓
1010

compl. a 2

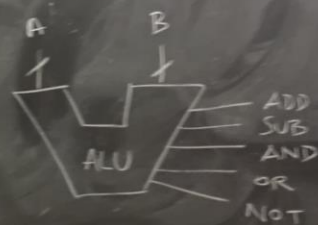
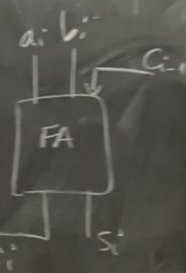
"veloce



ALU (Arithmetic-Logic Unit)

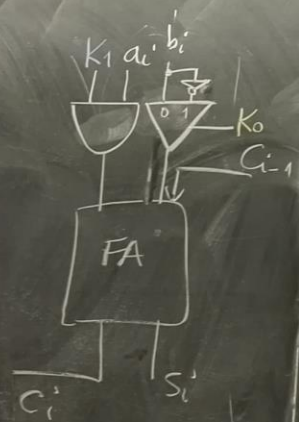


note: Segnali
Codificati
o
decodificati
("in chiano")
"SUB"



f | 1b
e | f | c
d

Unit)



$$C_i = a_i b_i + a_i C_{i-1} + b_i C_{i-1}$$

$$S_i = a_i \bar{C}_i + b_i \bar{C}_i + C_{i-1} \bar{C}_i + a_i b_i C_{i-1}$$

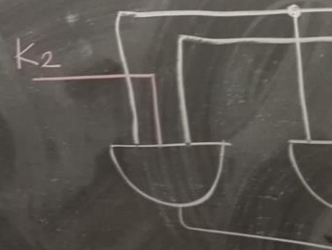
K_3	K_2	K_1	K_0	C_{-1}
0	1	x	x	x
0	0	1	0	0
1	x	1	0	1

operation

come prima

A OR B

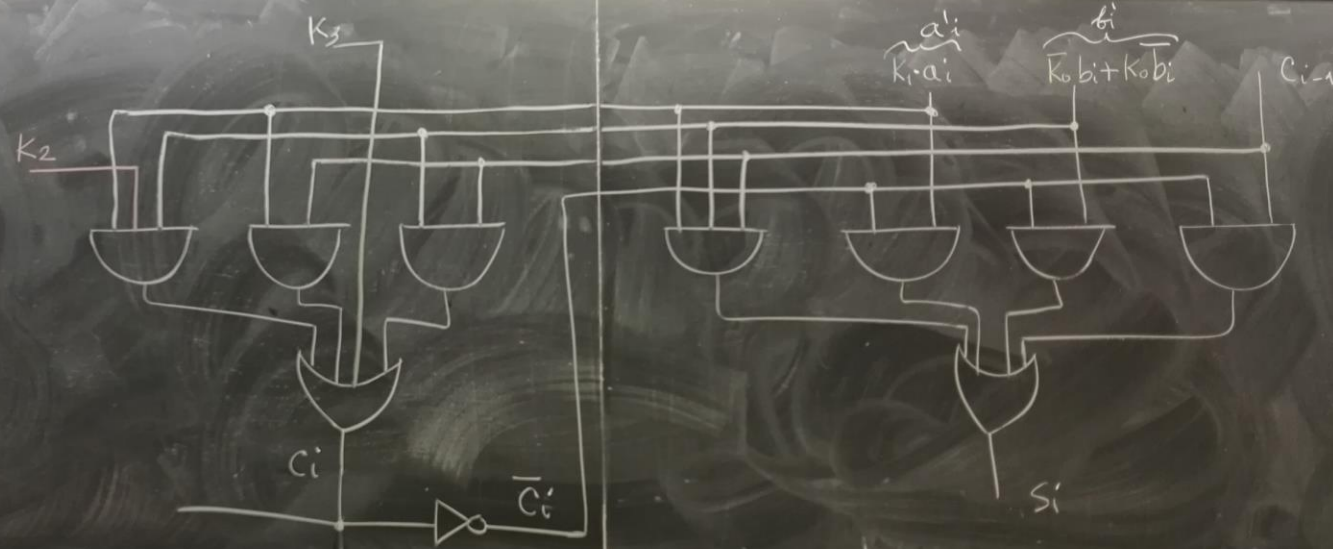
A AND B



$$= a_i b_i + a_i c_{i-1} + b_i c_{i-1}$$

$$= a_i \bar{c}_i + b_i \bar{c}_i + c_{i-1} \bar{c}_i + a_i b_i c_{i-1}$$

K_1	K_0	C_{-1}	operazione
x	x	x	come prima
1	0	0	A OR B
1	0	1	A AND B



matematica ricreativa:

Martin Gardner

logica ricreativa

Ray Smullyan

Soluzioni di ep. logiche

$$\begin{aligned} A \leftrightarrow \alpha &= \begin{cases} 1 & A \text{ cav} \\ 0 & A \text{ non} \end{cases} \\ B \leftrightarrow \beta \end{aligned}$$

A e B

1) A : "Siamo entrambi manigoldi"

Sol. : A manigoldo
B cavaliere

$$A \leftrightarrow \alpha = \begin{cases} 1 & A \text{ cav} \\ 0 & A \text{ man} \end{cases}$$

$$B \leftrightarrow \beta$$

sono entrambi manigoldi"

manigoldo
cavalieri

$$\varphi(\alpha, \beta) = \bar{\alpha} \cdot \bar{\beta}$$

$$\overline{\varphi(\alpha, \beta)} = \alpha + \beta$$

$$1 = \alpha \varphi(\alpha, \beta) + \bar{\alpha} \overline{\varphi(\alpha, \beta)} =$$

$$= \alpha \cancel{\bar{\alpha}} \bar{\beta} + \bar{\alpha} (\alpha + \beta) = \cancel{\alpha} \bar{\alpha} + \bar{\alpha} \beta$$

$$\Rightarrow \bar{\alpha} \beta = 1 \text{ oia } \alpha = 0$$

$$\beta = 1$$

- 2) A: "Almeno uno di noi è un manigoldo"
- 3) A: "Se B è un manigoldo, io sono un cavaliere"
- B: "A ed io siamo diversi"