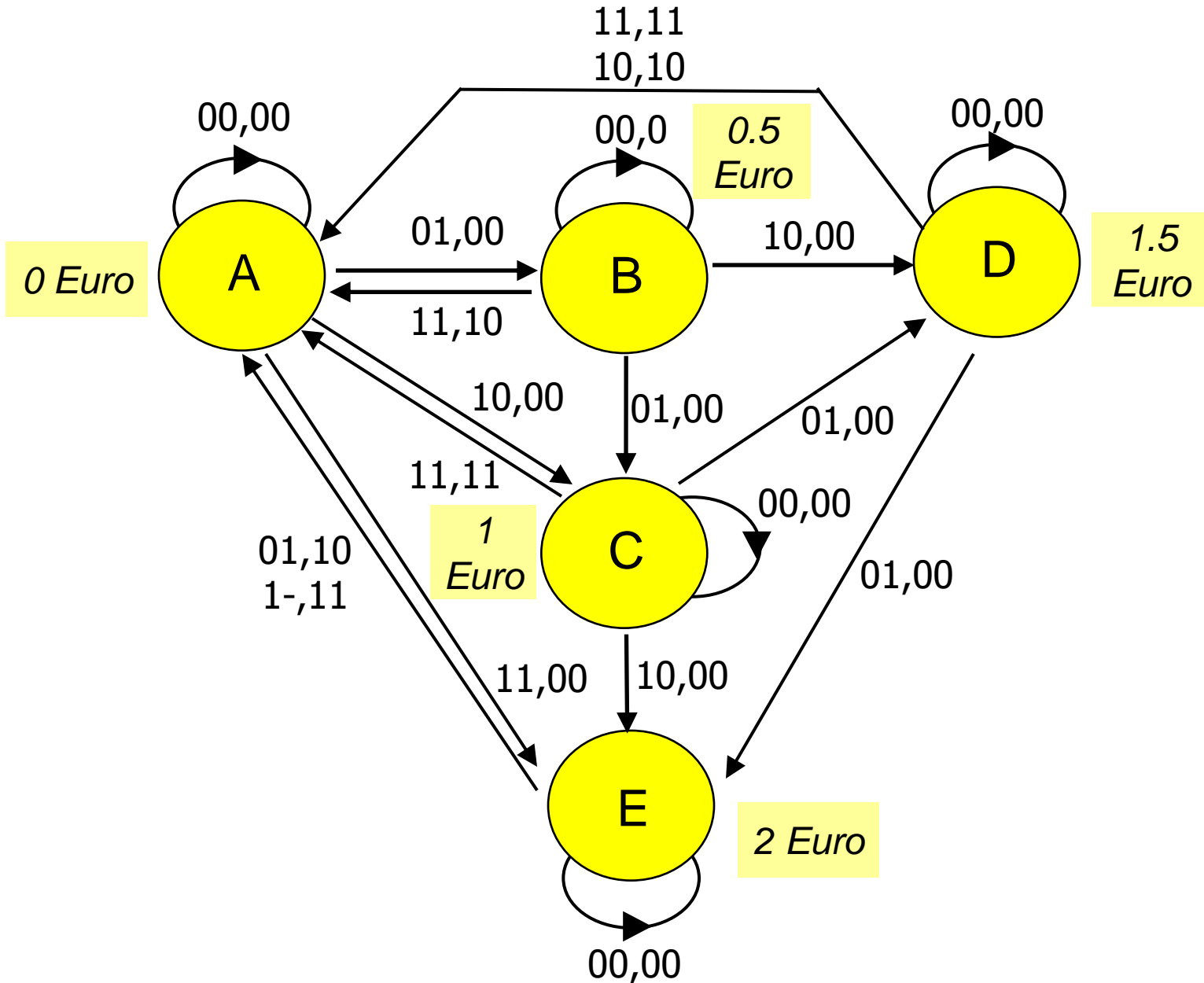


Esercizio 1.1



Esercizio 1.2 – TdF e TdT

s.p.

		AB			
		00	01	11	10
A	A,00	B,00	E,00	C,00	
B	B,00	C,00	A,10	D,00	
C	C,00	D,00	A,11	E,00	
D	D,00	E,00	A,11	A,10	
E	E,00	A,10	A,11	A,11	

s.f., PR

s.p.

		AB			
		00	01	11	10
000	000,00	001,00	100,00	010,00	
001	001,00	010,00	000,10	011,00	
010	010,00	011,00	000,11	100,00	
011	011,00	100,00	000,11	000,10	
100	100,00	000,10	000,11	000,11	
101	-,-	-,-	-,-	-,-	
110	-,-	-,-	-,-	-,-	
111	-,-	-,-	-,-	-,-	

s.f., PR

Esercizio 1.3 – Mappe di Karnaugh

		AB			
		00	01	11	10
$y_1 y_0$	00	0	0	0	0
	01	0	0	1	0
	11	0	0	1	1
	10	0	0	1	0

$y_2 = 0$

		AB			
		00	01	11	10
$y_1 y_0$	00	0	1	1	1
	01	-	-	-	-
	11	-	-	-	-
	10	-	-	-	-

$y_2 = 1$

$$P(SP) = y_2 B + y_2 A + y_1 y_0 A + y_0 A B + y_1 A B$$

Esercizio 1.3 – Mappe di Karnaugh

		AB			
		00	01	11	10
$y_1 y_0$	00	0	0	0	0
	01	0	0	0	0
	11	0	0	1	0
	10	0	0	1	0

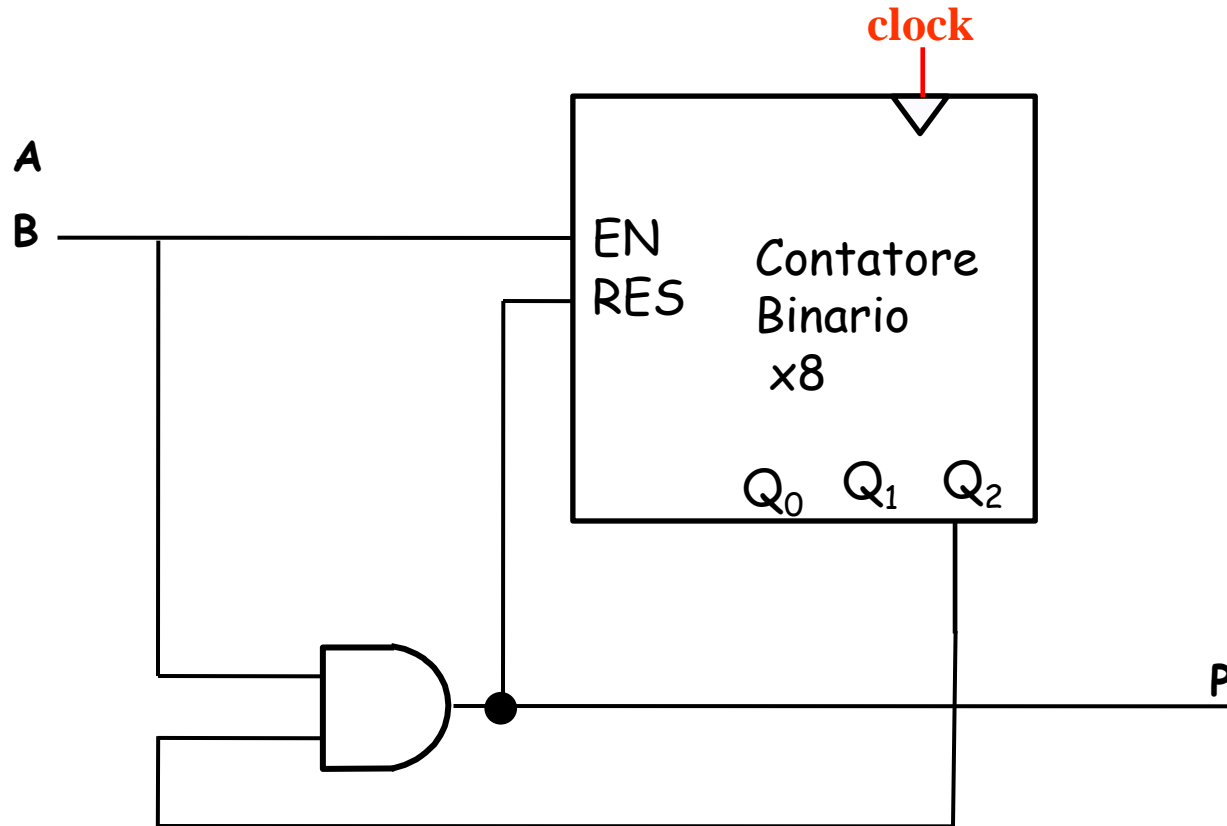
$y_2 = 0$

		AB			
		00	01	11	10
$y_1 y_0$	00	0	0	1	1
	01	-	-	-	-
	11	-	-	-	-
	10	-	-	-	-

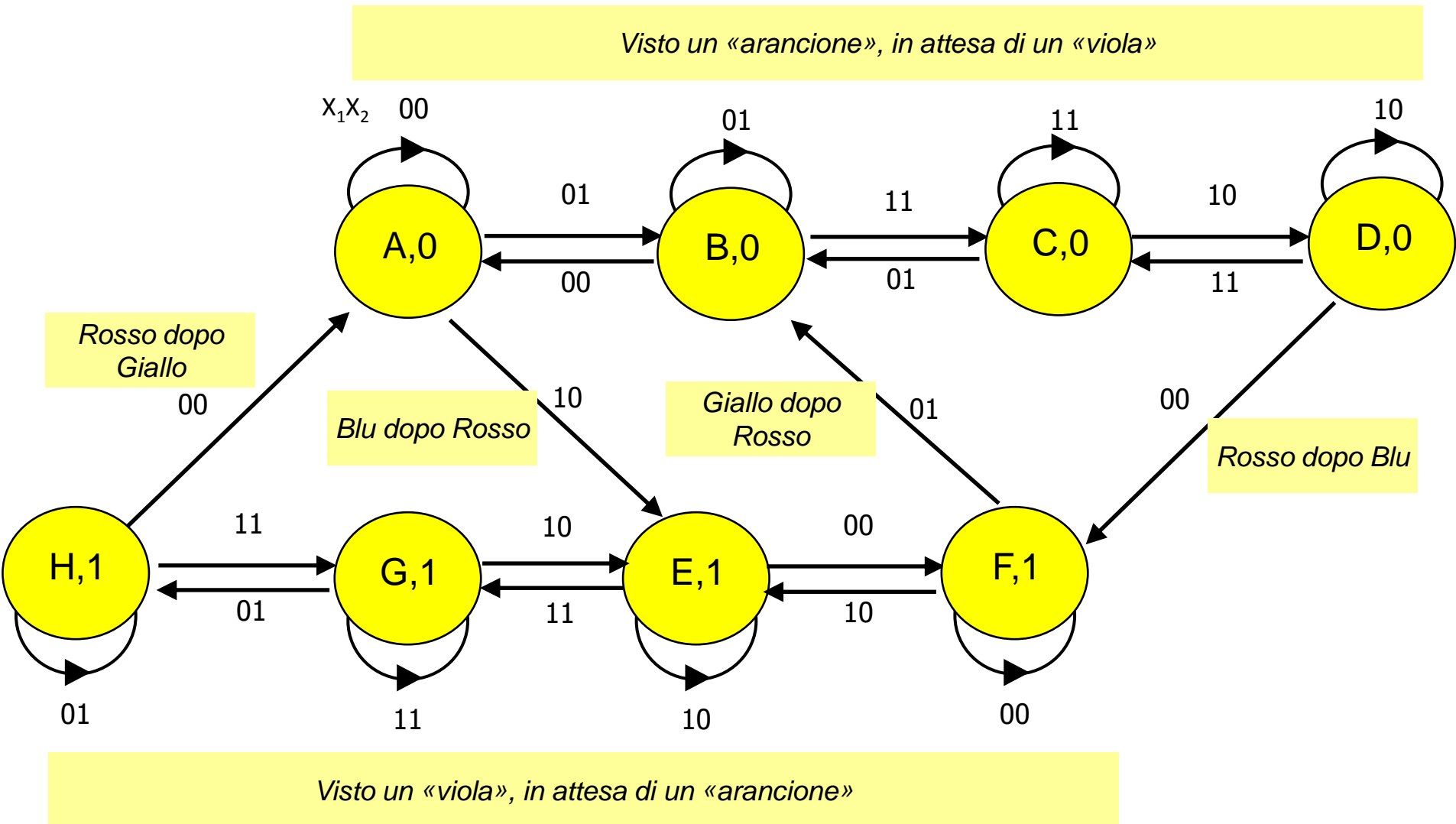
$y_2 = 1$

$$R(SP) = y_1 A B + y_2 A$$

Esercizio 1.4 – Sintesi diretta



Esercizio 2.1 – Grafo degli Stati



Esercizio 2.2 – Tabella triangolare e CMC

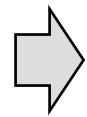
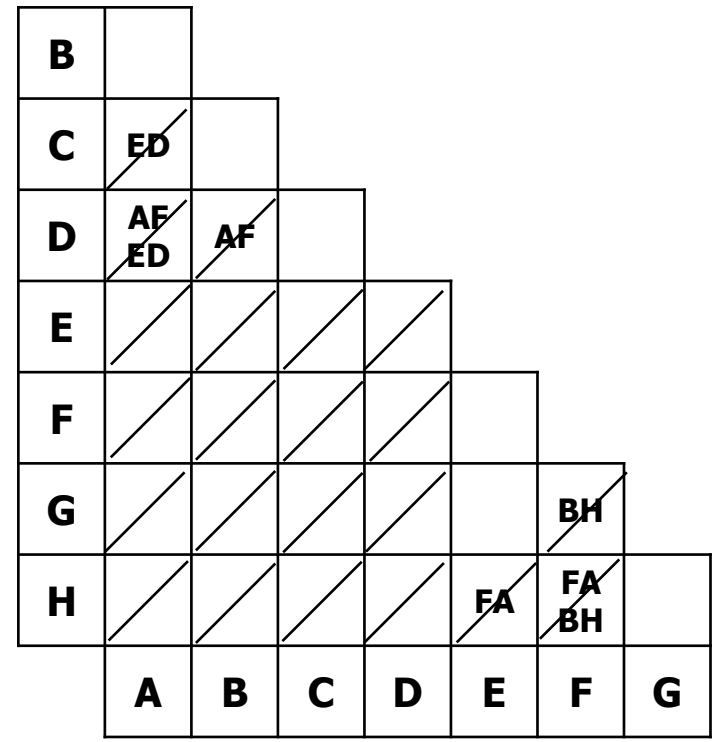
X_1X_2

	00	01	11	10
A	A,0	B,0	-, -	E, -
B	A,0	B,0	C,0	-, -
C	-, -	B,0	C,0	D,0
D	F, -	-, -	C,0	D,0
E	F,1	-, -	G,1	E,1
F	F,1	B, -	-, -	E,1
G	-, -	H,1	G,1	E,1
H	A, -	H,1	G,1	-, -

s.p.

s.f., E

AB, BC, CD, EF, EG, GH



$a=\{AB\}$, $b=\{CD\}$,
 $c=\{EF\}$, $d=\{GH\}$

Esercizio 2.2 – TdF automa minimo

s.p.

		X_1X_2			
		00	01	11	10
a = AB	a,0	a,0	b,0	c,-	
b = CD	c,-	a,0	b,0	b,0	
c = EF	c,1	a,-	d,1	c,1	
d = GH	a,-	d,1	d,1	c,1	

s.f., Z

$y_0 \backslash y_1$	0	1
0	a ↔ b	
1	c ↔ d	

Codifica 1:
 presenza di corse critiche non eliminabili tramite 2 sole variabili di stato -> necessario valutare altre codifiche

$y_0 \backslash y_1$	0	1
0	a ↔ b	
1	d ↔ c	

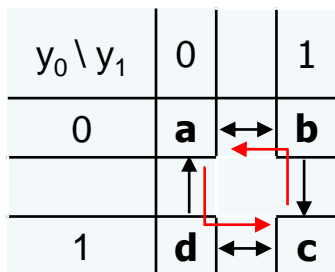
s.p.

Codifica 2:
 presenza di corse critiche nelle 2 transizioni tra a e c. Si possono entrambe risolvere tramite transizioni multiple (si veda TdF modificata a fianco)

		X_1X_2			
		00	01	11	10
a = AB	a,0	a,0	b,0	d,-	
b = CD	c,-	a,0	b,0	b,0	
c = EF	c,1	b,-	d,1	c,1	
d = GH	a,-	d,1	d,1	c,1	

s.f., Z

Esercizio 2.3 – Grafo adiacenze e TdT



s.p.

		X_1X_2			
		00	01	11	10
a=AB		a,0	a,0	b,0	d,-
b = CD		c,-	a,0	b,0	b,0
c = EF		c,1	b,-	d,1	c,1
d = GH		a,-	d,1	d,1	c,1

s.f., Z

		X_1X_2			
y_0y_1		00	01	11	10
A=00		00,0	00,0	01,0	10,-
B=01		11,-	00,0	01,0	01,0
C=11		11,1	01,-	10,1	11,1
D=10		00,-	10,1	10,1	11,1

Y_0Y_1, Z

Esercizio 2.4 e 2.5 – Mappe di Karnaugh di Y_1

		x_1x_2			
		00	01	11	10
y_0y_1	00	0	0	1	0
	01	1	0	1	1
	11	1	1	0	1
	10	0	0	0	1

Rimozione alea statica

$$Y_2 \text{ (PS)} = (x_1 + y_1) (y_0 + y_1 + x_2) (x_1 + x_2' + y_0) (x_1' + x_2' + y_0') (x_2' + y_0' + y_1)$$

$$Y_2 \text{ (NOR)} = (x_1 \downarrow y_1) \downarrow (y_0 \downarrow y_1 \downarrow x_2) \downarrow (x_1 \downarrow x_2' \downarrow y_0) \downarrow (x_1' \downarrow x_2' \downarrow y_0') \downarrow (x_2' \downarrow y_0' \downarrow y_1)$$