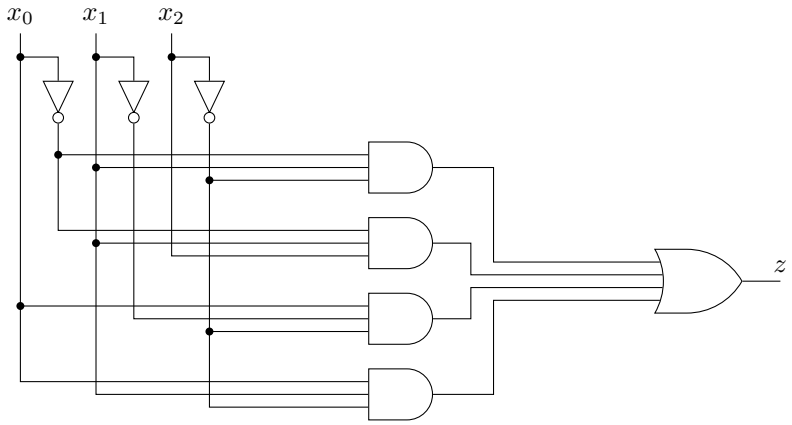
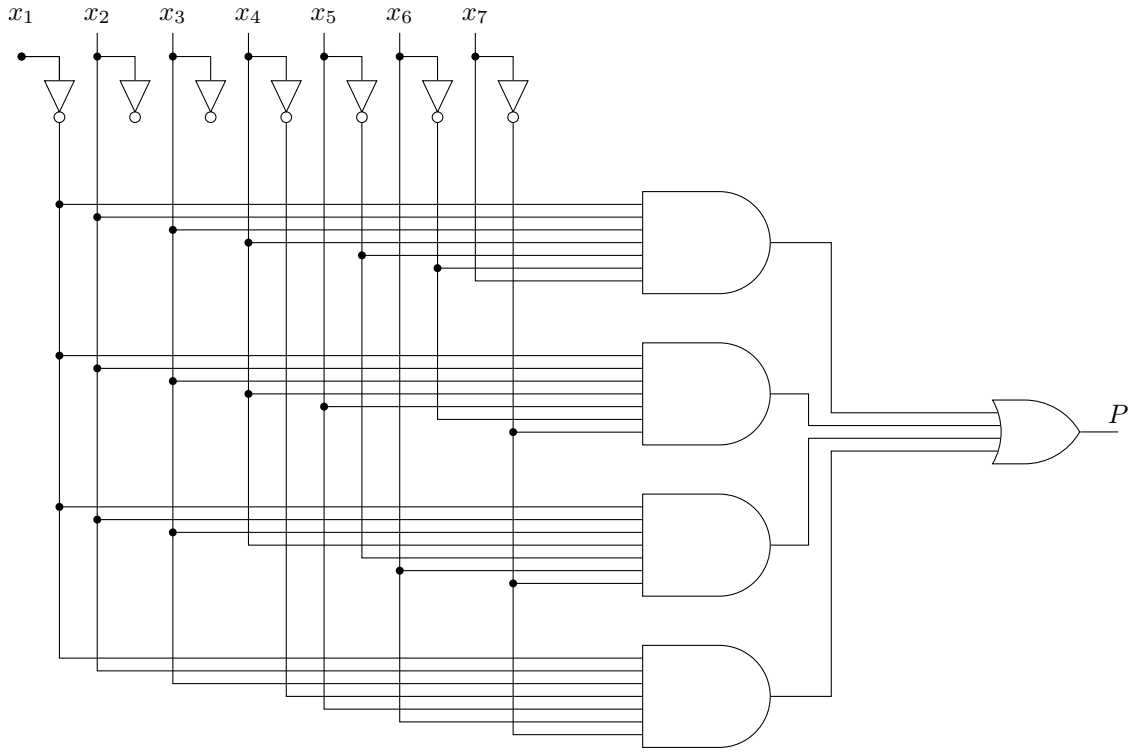
1 Logic circuit 1

$$z = (x_0 \cdot x_1 \cdot \neg x_2) + (x_0 \cdot x_1 \cdot x_2) + (x_0 \cdot \neg x_1 \cdot x_2) + (\neg x_0 \cdot x_1 \cdot x_2) \tag{1}$$

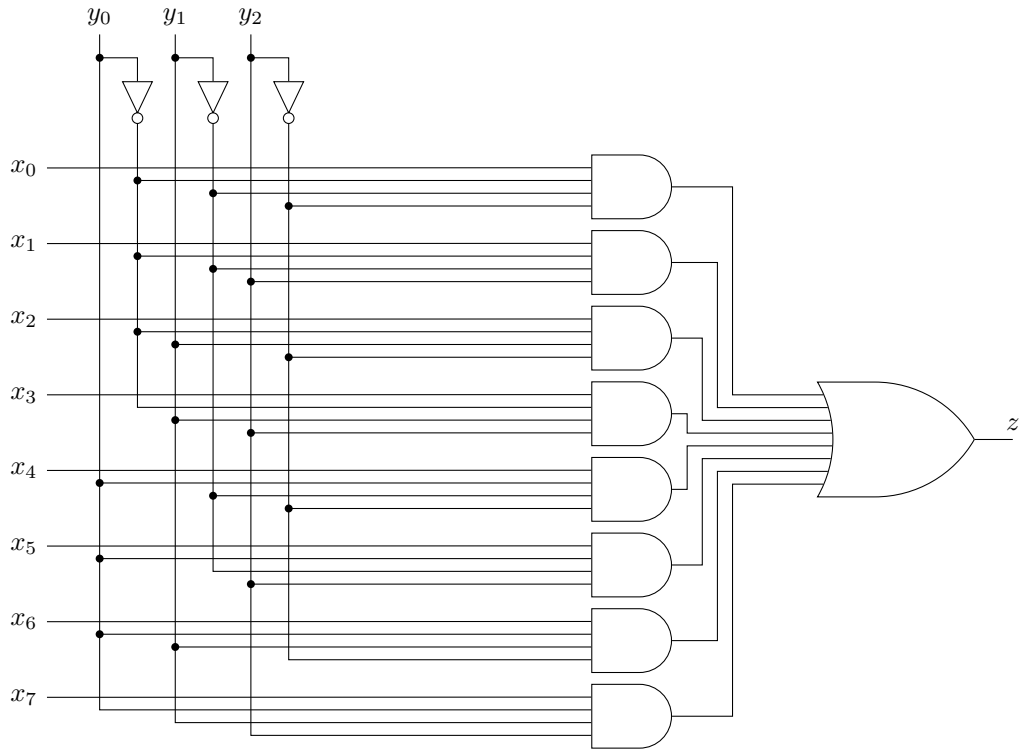


2 Logic circuit 2

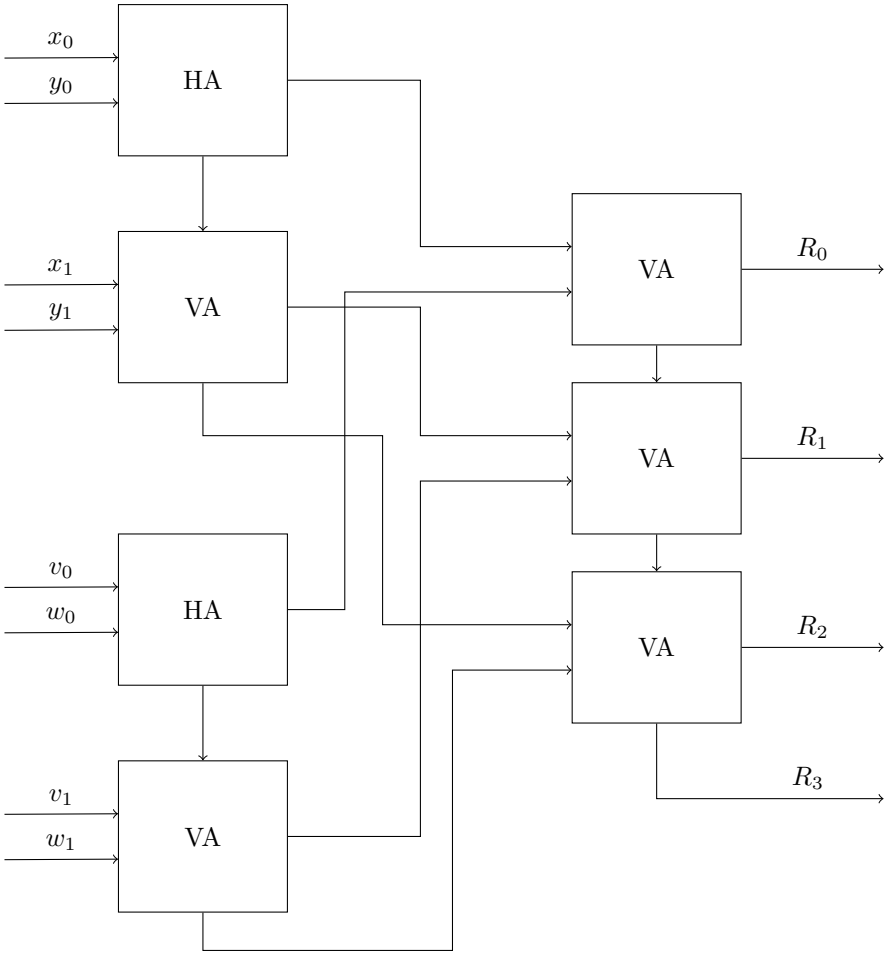


3 Logic circuit 3

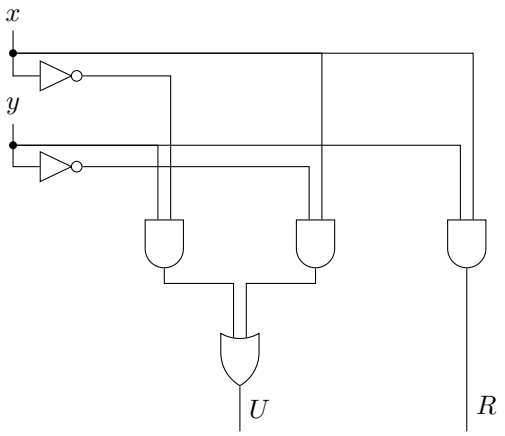
3-Mux



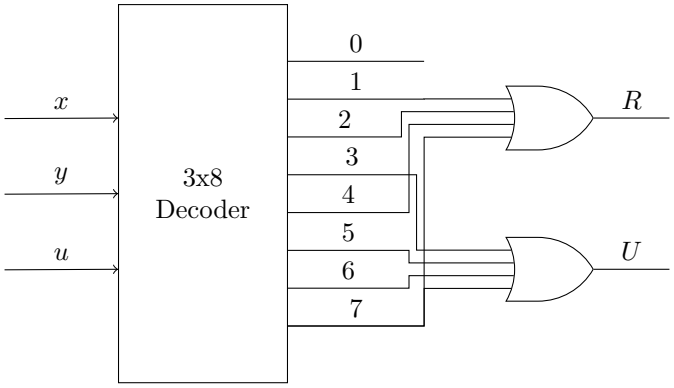
4 Adder



5 Halfadder



6 Decoder



7 Karnaugh Map

$f(A,B,C,D):$

A \ B \ C \ D	00	01	11	10
00	1 (0)	1 (1)	1 (5)	1 (4)
01	0 (2)	0 (3)	0 (7)	0 (6)
11	0 (10)	0 (11)	0 (15)	0 (14)
10	0 (8)	1 (9)	1 (13)	1 (12)

$$\neg A\neg B + \neg BD + \neg BC \tag{2}$$

8 K2

$f(x_1,x_2,x_3,x_4):$

x_1 \ x_2 \ x_3 \ x_4	00	01	11	10
00	0 (0)	0 (1)	1 (5)	1 (4)
01	1 (2)	0 (3)	1 (7)	1 (6)
11	D (10)	D (11)	D (15)	D (14)
10	0 (8)	1 (9)	D (13)	D (12)