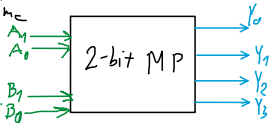
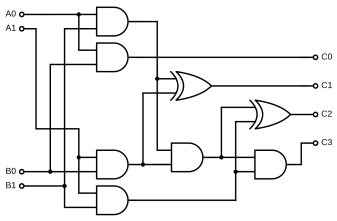
CIT (násobička)

sobota 15. června 2024 20:34

2bitová násobička

1): blokové schéma



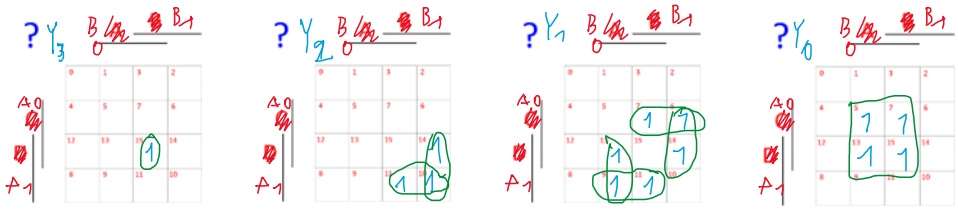


2bitová násobička

2) tabulka chování

Dec	Bin		Dec	Bin		Bin				Dec
Ax	A1 (1.řád)	A0 (0.řád)	Bx	B1 (1.řád)	B0 (0.řád)	Y3 (3.řád)	Y2 (2.řád)	Y1 (1.řád)	Y0 (0.řád)	Yx
0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	1	0	0	0	0	0
0	0	0	2	1	0	0	0	0	0	0
0	0	0	3	1	1	0	0	0	0	0
1	0	1	0	0	0	0	0	0	0	0
1	0	1	1	0	1	0	0	0	1	1
1	0	1	2	1	0	0	0	1	0	2
1	0	1	3	1	1	0	0	1	1	3
2	1	0	0	0	0	0	0	0	0	0
2	1	0	1	0	1	0	0	1	0	2
2	1	0	2	1	0	0	1	0	0	4
2	1	0	3	1	1	0	1	1	0	6
3	1	1	0	0	0	0	0	0	0	0
3	1	1	1	0	1	0	0	1	1	3
3	1	1	2	1	0	0	1	1	0	6
3	1	1	3	1	1	1	0	0	1	9

3) logická funkce obvodu



4) minimalizace

$$Y_3(A_1, A_0, B_1, B_0) = (A_1 \cdot A_0 \cdot B_1 \cdot B_0)$$

$$Y_2(A_1, A_0, B_1, B_0) = (A_1 \cdot \overline{A_0} \cdot B_1) + (A_1 \cdot B_1 \cdot \overline{B_0})$$

$$Y_1(A_1, A_0, B_1, B_0) = (A_1 \cdot \overline{B_1} \cdot B_0) + (A_1 \cdot \overline{A_0} \cdot B_0) + (\overline{A_1} \cdot A_0 + B_1) \cdot (A_0 \cdot B_1 \cdot \overline{B_0})$$

$$Y_0(A_1, A_0, B_1, B_0) = (A_0 \cdot B_0)$$

5) převod na nand

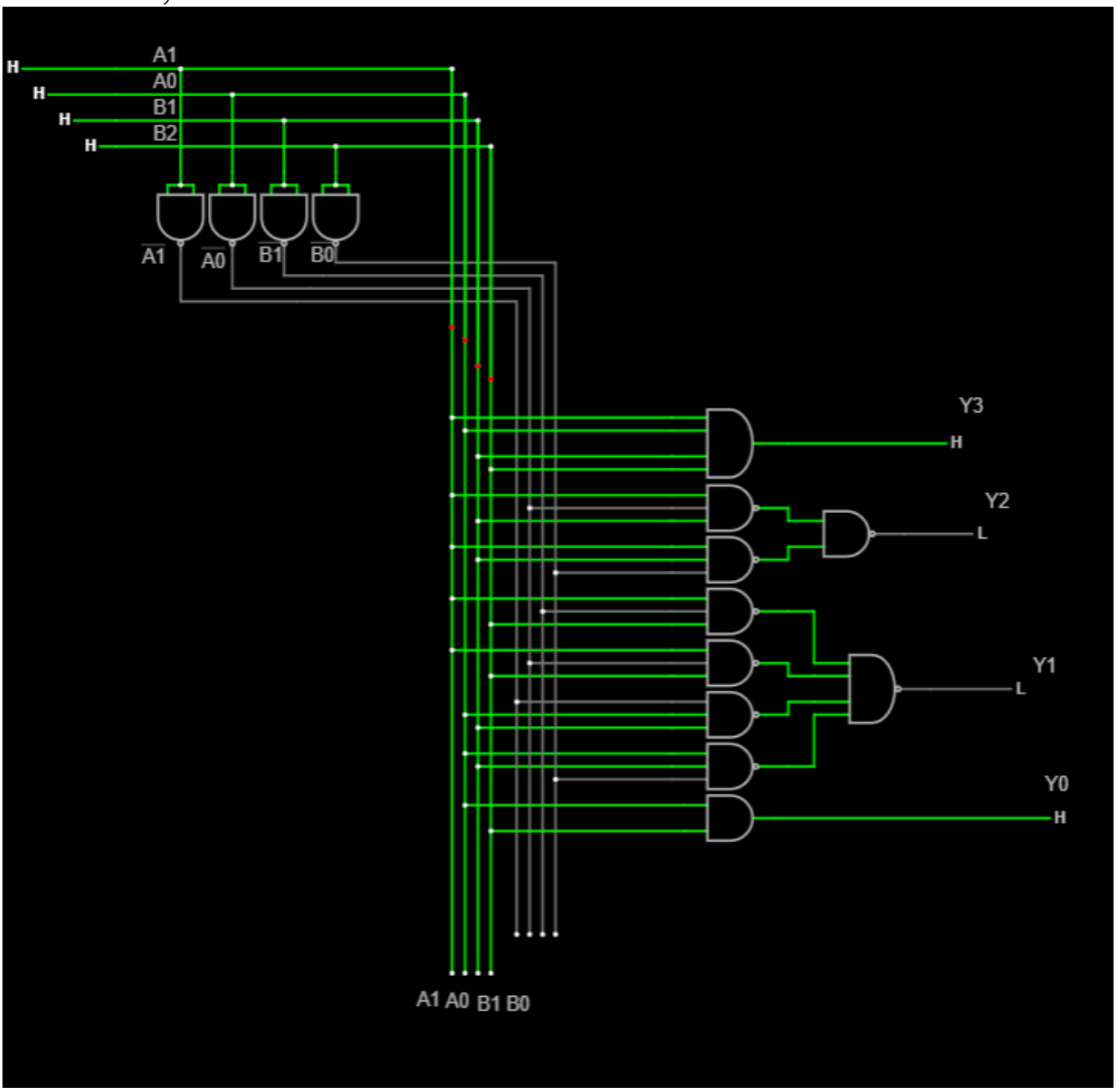
$$Y_3 = \overline{\overline{A_1 A_0 B_1 B_0}} \Rightarrow \text{převedeme na 1and}$$

$$Y_2 = \overline{\overline{A_1 \overline{A_0} B_1} \cdot \overline{A_1 B_1 \overline{B_0}}}$$

$$Y_1 = \overline{\overline{A_1 \overline{B_1} B_0} \cdot \overline{A_1 \overline{A_0} B_0} \cdot \overline{\overline{A_1} A_0 B_1} \cdot \overline{A_0 B_1 \overline{B_0}}}$$

$$Y_0 = \overline{\overline{A_0 B_0}} \Rightarrow \text{převedeme na 1and}$$

6) Zapojení



https://tinyurl.com/293ncoxh