

Λογική Σχεδίαση

Εργαστηριακή Άσκηση 4

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A)

$\Lambda A = A$

“1”=πράσινο

$\Phi AB = YAB$

$\Lambda B = B$

“0”=κόκκινο

$\Phi CD = YCD$

$\Lambda C = C$

$\Lambda D = D$

$\Lambda C = 1 \ \&\& \ \Lambda D = 1 \ \&\& \ \Lambda A = 0 \ || \ \Lambda B = 0$

$\Lambda C = 1 \ || \ \Lambda D = 1 \ \&\& \ \Lambda A = 0 \ \&\& \ \Lambda B = 0$

A	B	C	D	YAB	YCD
0	0	0	0	1	0
0	0	0	1	0	1
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	1	0
0	1	0	1	1	0
0	1	1	0	1	0
0	1	1	1	0	1
1	0	0	0	1	0
1	0	0	1	1	0
1	0	1	0	1	0
1	0	1	1	0	1
1	1	0	0	1	0
1	1	0	1	1	0
1	1	1	0	1	0
1	1	1	1	1	0

$$\begin{aligned} YAB = & A'B'C'D' + A'BC'D' + A'BC'D + A'BCD' + AB'C'D' + AB'C'D + AB'CD' + \\ & ABC'D' + ABC'D + ABCD' + ABCD \end{aligned}$$

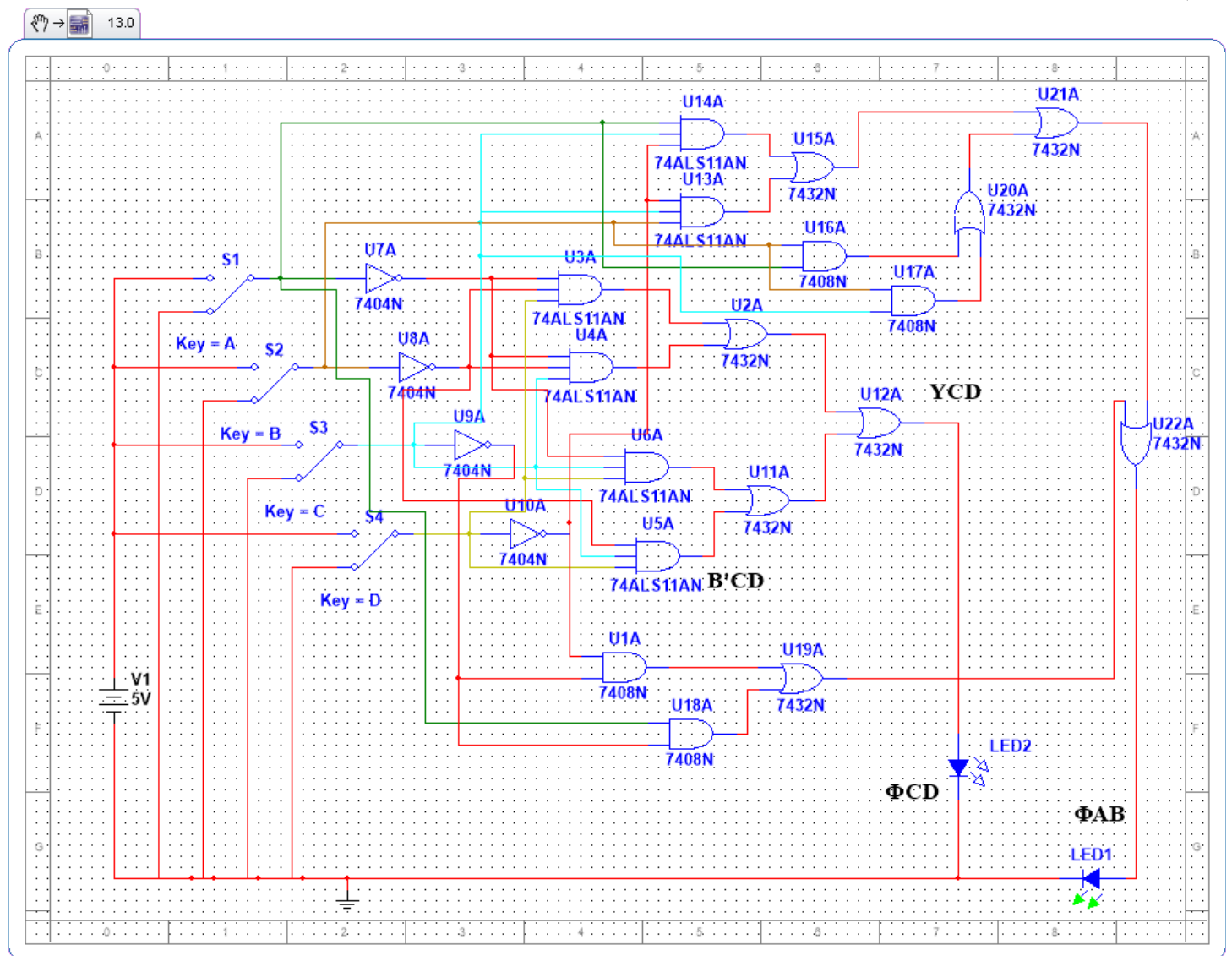
AB\CD	00	01	11	10
00	1	0	0	0
01	1	1	0	1
11	1	1	1	1
10	1	1	0	1

$$YAB = C'D' + AB + BC' + AC' + BCD' + ACD'$$

$$YCD = A'B'C'D + A'B'CD' + A'B'CD + A'BCD + AB'CD$$

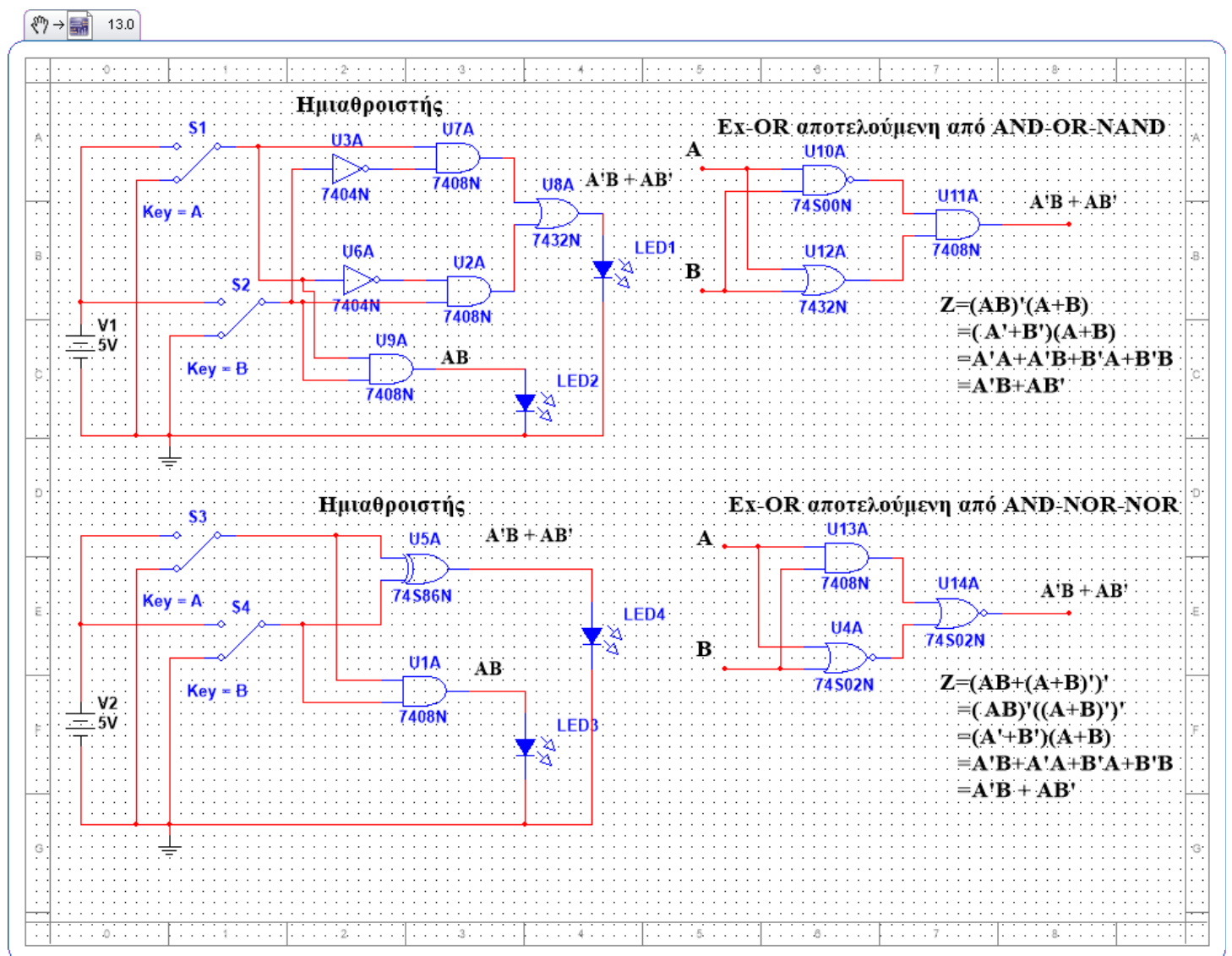
AB\CD	00	01	11	10
00	0	1	1	1
01	0	0	1	0
11	0	0	0	0
10	0	0	1	0

$$YCD = A'B'D + A'B'C + A'CD + B'CD$$



B)

A	B	$Z=A'B + AB'$	$K=AB$
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

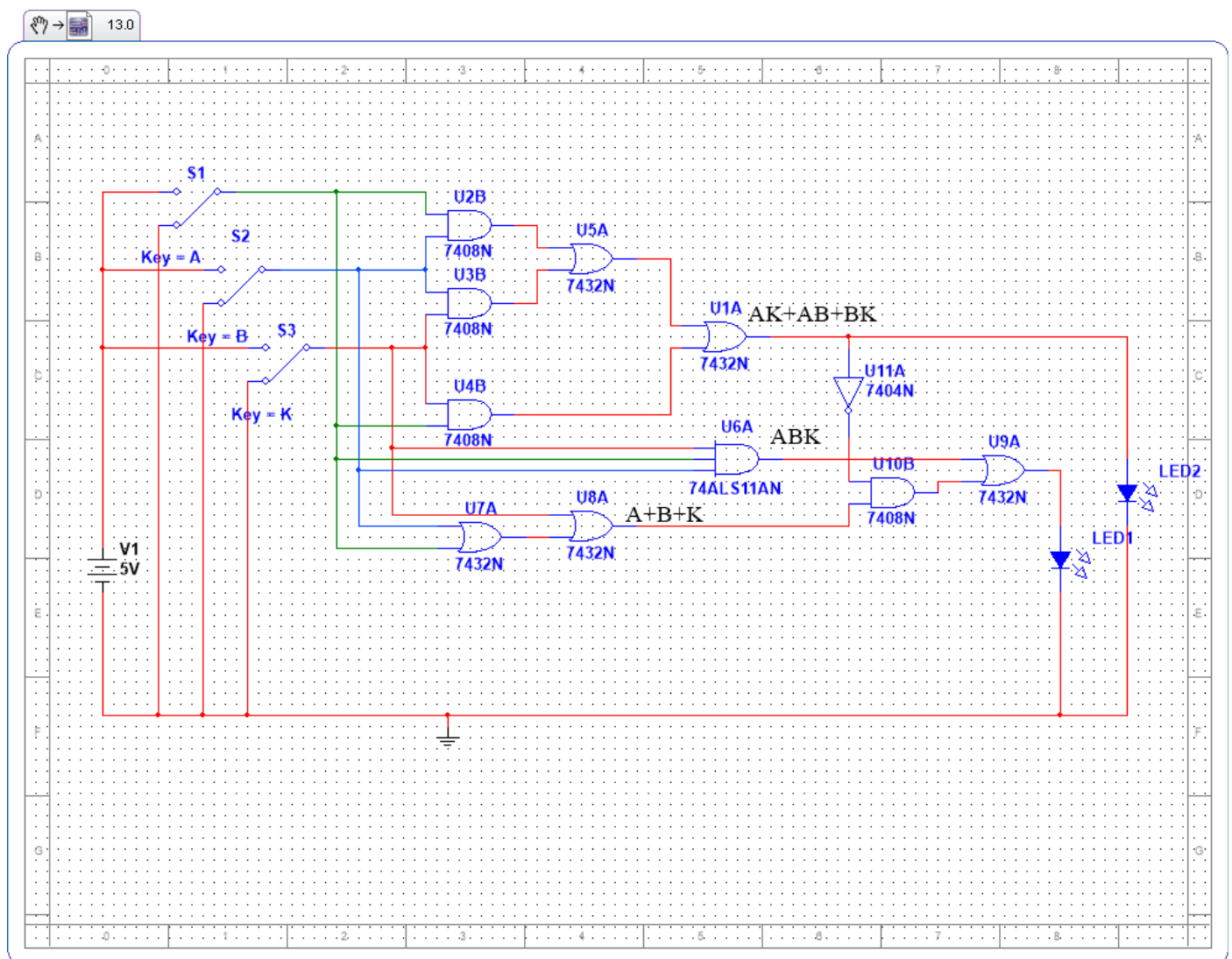


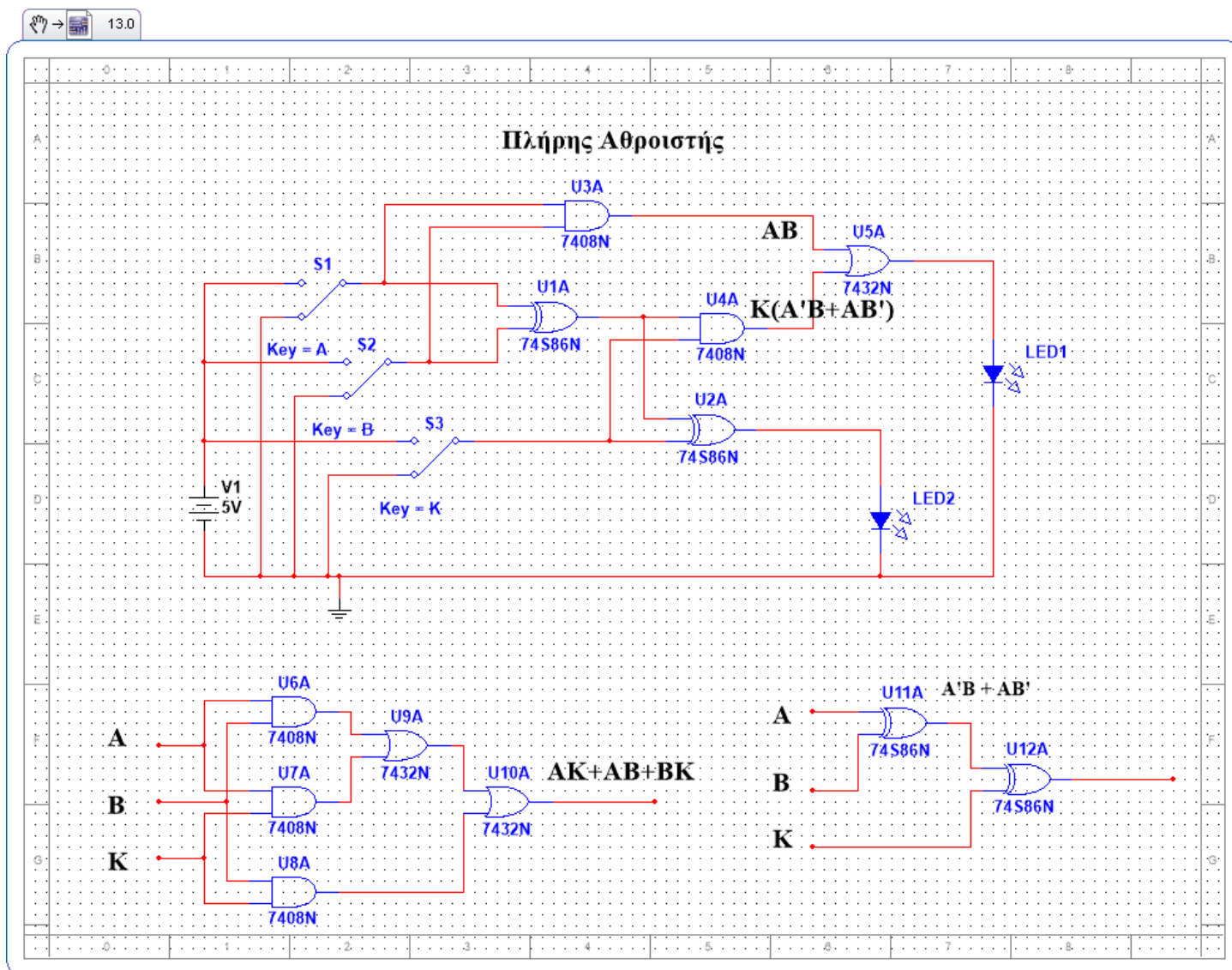
A	B	K	S	C
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

- $S = A'B'K + A'BK' + AB'K' + ABK = (A+B+K)(AB+BK+AK)' + ABK$
- $C = A'BK + AB'K + ABK' + ABK$

A\BK	00	01	11	10
0	0	0	1	0
1	0	1	1	1

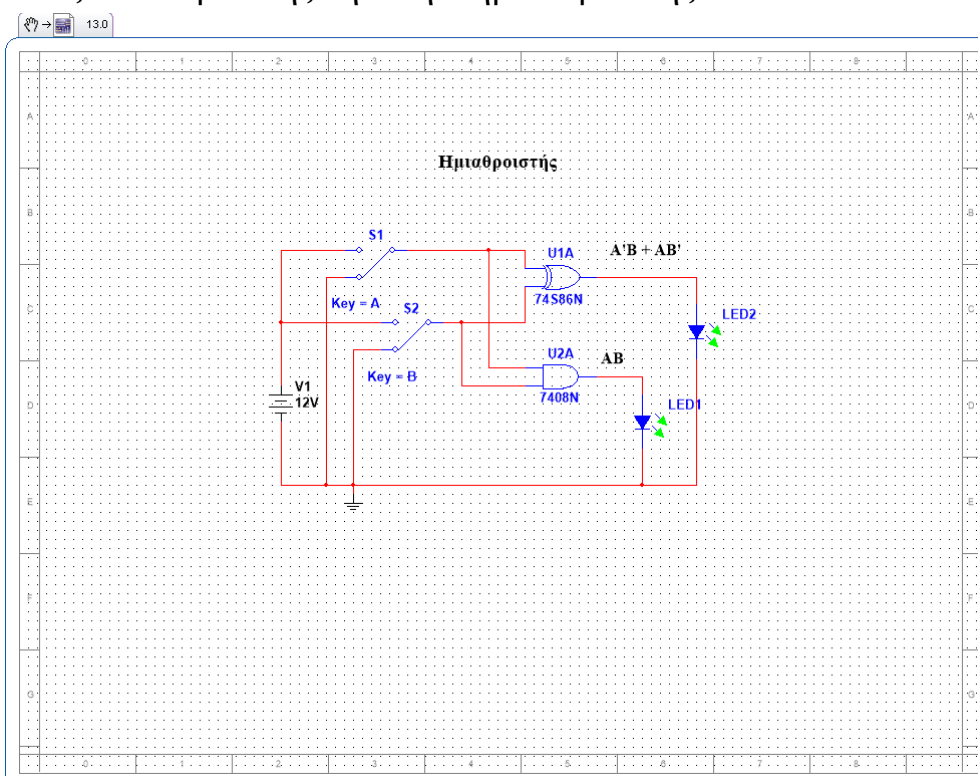
- $C = AK + AB + BK$





$$N=2 \bmod 3 \Rightarrow N=2$$

Άρα προκύπτει ένας 2bit αθροιστής δηλαδή ο ημιαθροιστής



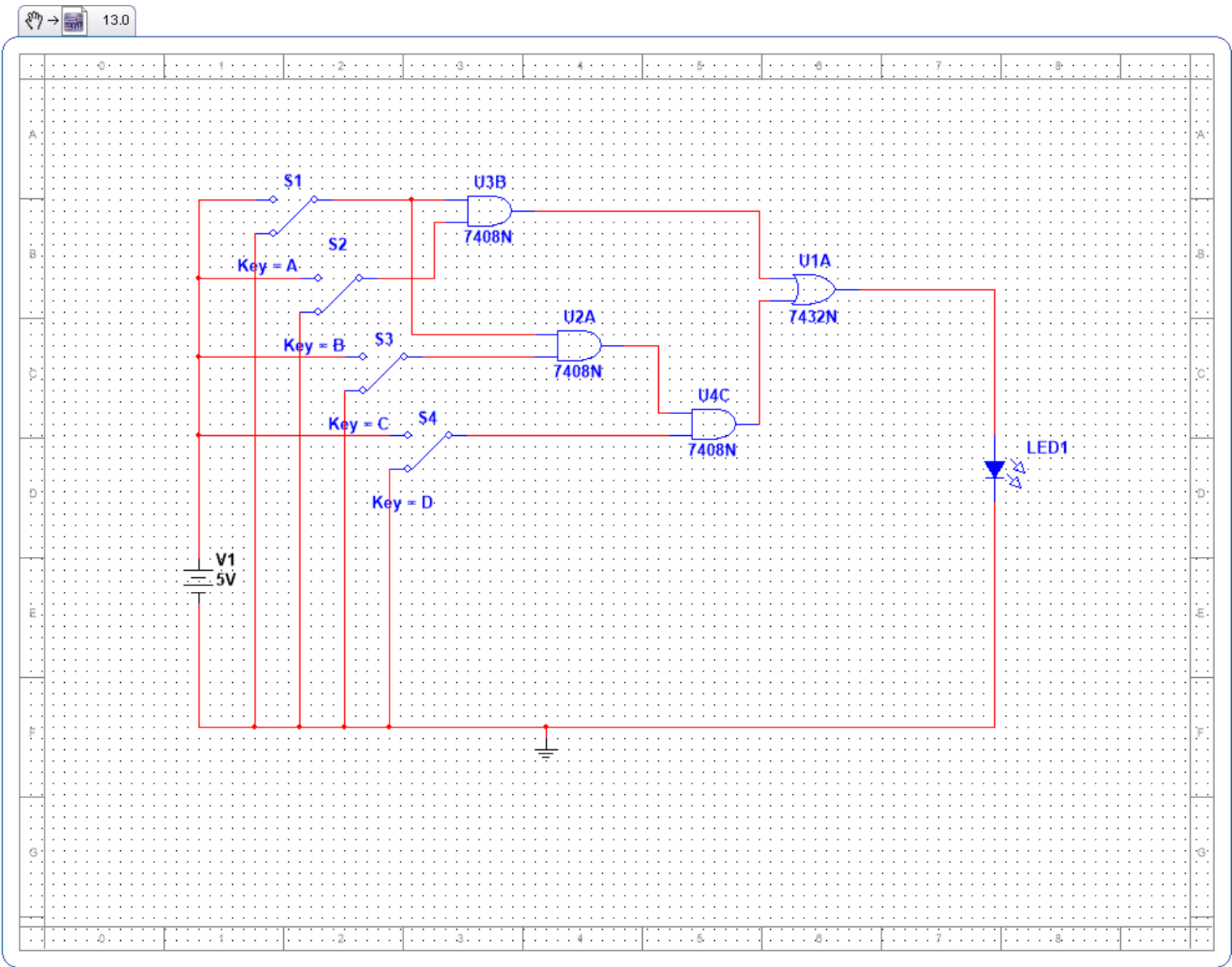
Г)
B=026 mod 16=10

a	b	c	d	y
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

$Y=ab'cd + abc'd' + abc'd + abcd' + abcd$

ab\cd	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	1	1	1	1
10	0	0	1	0

$Y=ab + acd$



Δ)

$$N=2 \bmod 3 \Rightarrow N=2$$

Πίνακας Αληθείας Συγκριτή Ισότητας 2 bits				
A	B	C	D	X=Y
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

$$Y=A'B'C'D' + A'BC'D + AB'CD' + ABCD$$

AB\CD	00	01	11	10
00	1	0	0	0
01	0	1	0	0
11	0	0	1	0
10	0	0	0	1

$$Y=(A\oplus C)(B\oplus D)$$

