1 my number:66

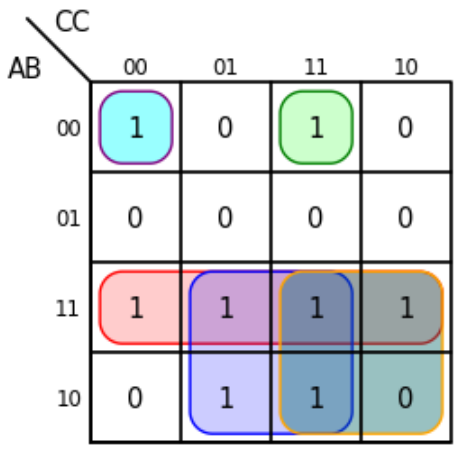
which is 1002_4 note: $\oplus$ is XOR

$Digits$	C_1	C_0	Output
$D_3 = 1$	0	0	$(A \oplus B)'$
$D_2 = 0$	0	1	A
$D_1 = 0$	1	0	$A \bullet B$
$D_0 = 2$	1	1	$A + B'$

2 therefore

C_0	C_1	A	B	R	
0	0	0	0	1	
0	0	0	1	0	$(A \oplus B)'$
0	0	1	0	0	
0	0	1	1	1	
0	1	0	0	0	
0	1	0	1	0	A
0	1	1	0	1	
0	1	1	1	1	
1	0	0	0	0	
1	0	0	1	0	$A \bullet B$
1	0	1	0	0	
1	0	1	1	1	
1	1	0	0	1	
1	1	0	1	0	$A + B'$
1	1	1	0	1	
1	1	1	1	1	

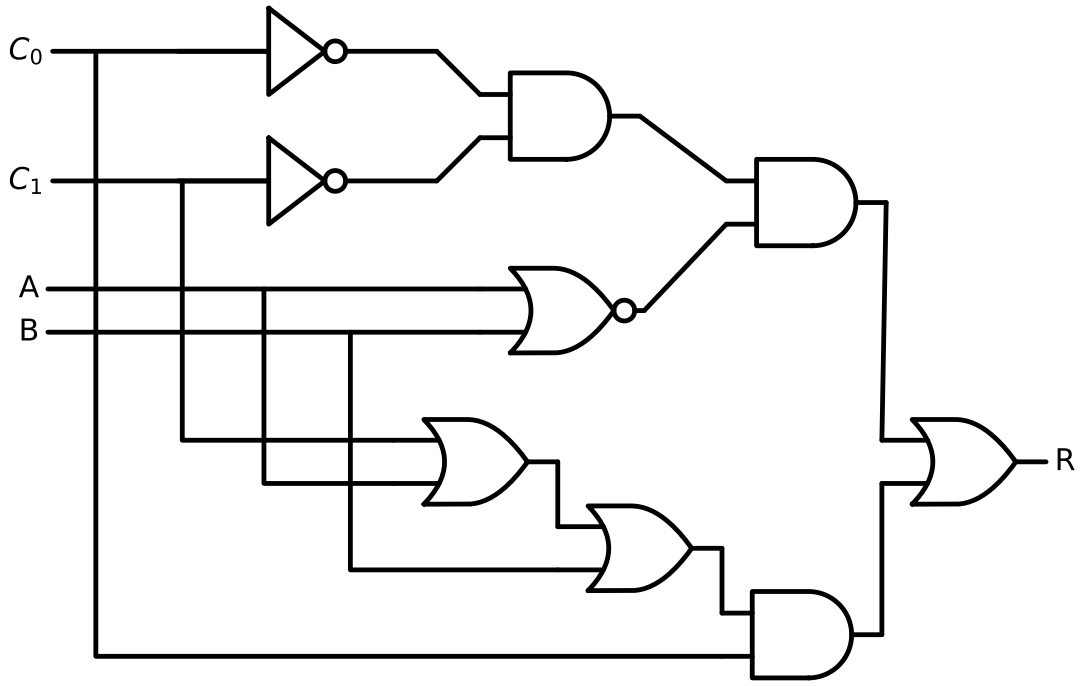
Out[5]:



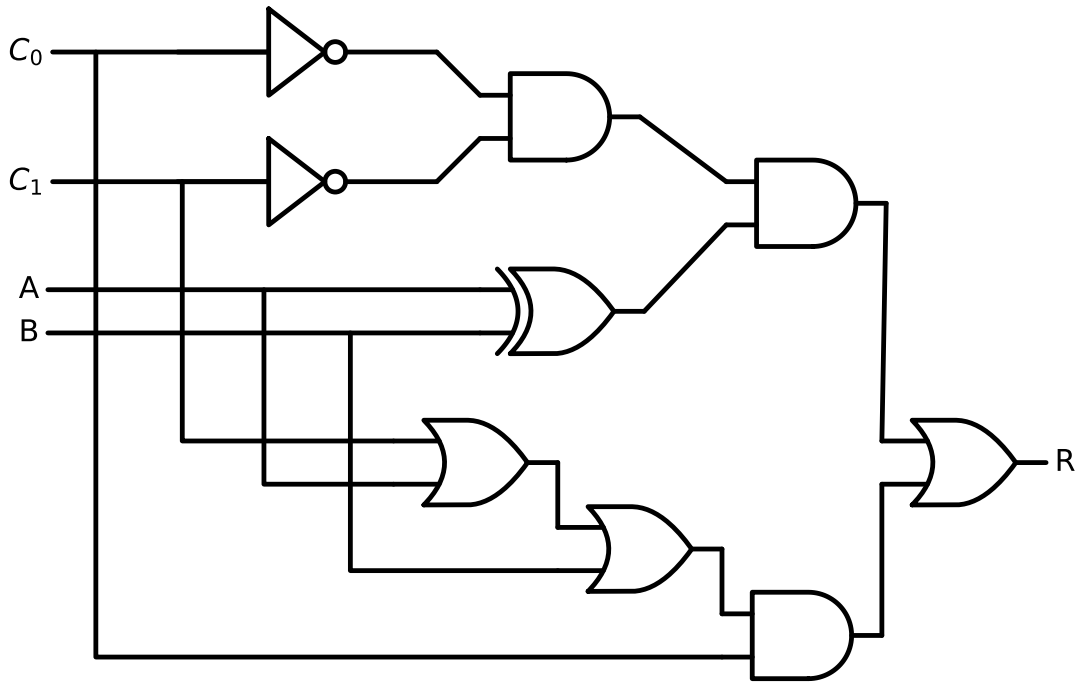
What we have here is

$$C_0 \bullet C_1 + B \bullet C_0 + A \bullet B \bullet C_0' \bullet C_1' + A' \bullet B' \bullet C_0' \bullet C_1' + A \bullet C_0$$

$$C_0(C_1 + A + B) + C_0' \bullet C_1' \bullet (A \oplus B)$$



score for the silicon area is 3* 2 + 6* 6 + 8 = 50 but the result is wrong

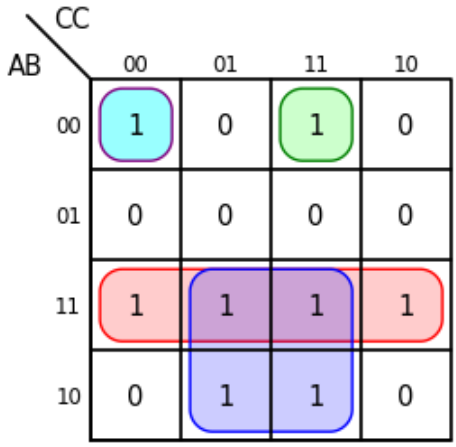


still, result is wrong

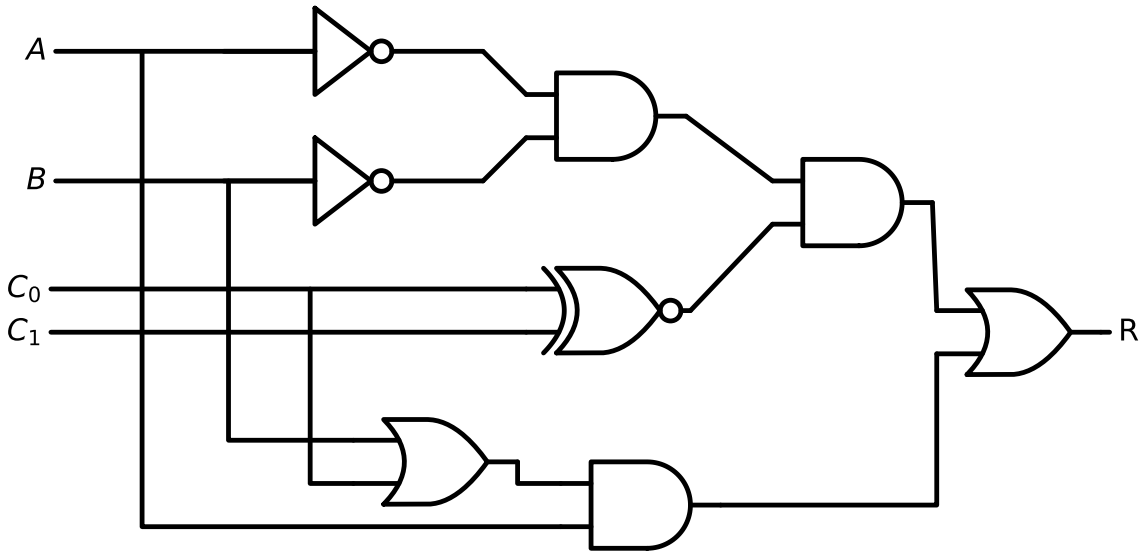
2.1 foolish me, the 1010case should be 0,the circuit was right if it is 1, but it should be 0

In [7]:
```
1 from schemdraw import logic
2 logic.Kmap(names='CCAB',↔
```

Out[7]:



$$A'B'(C_0 \oplus C_1) + AB + AC_1$$



actually I just need to remove one or gate. the total score for silicon is $3 \times 2 + 5 \times 6 + 8 = 44$

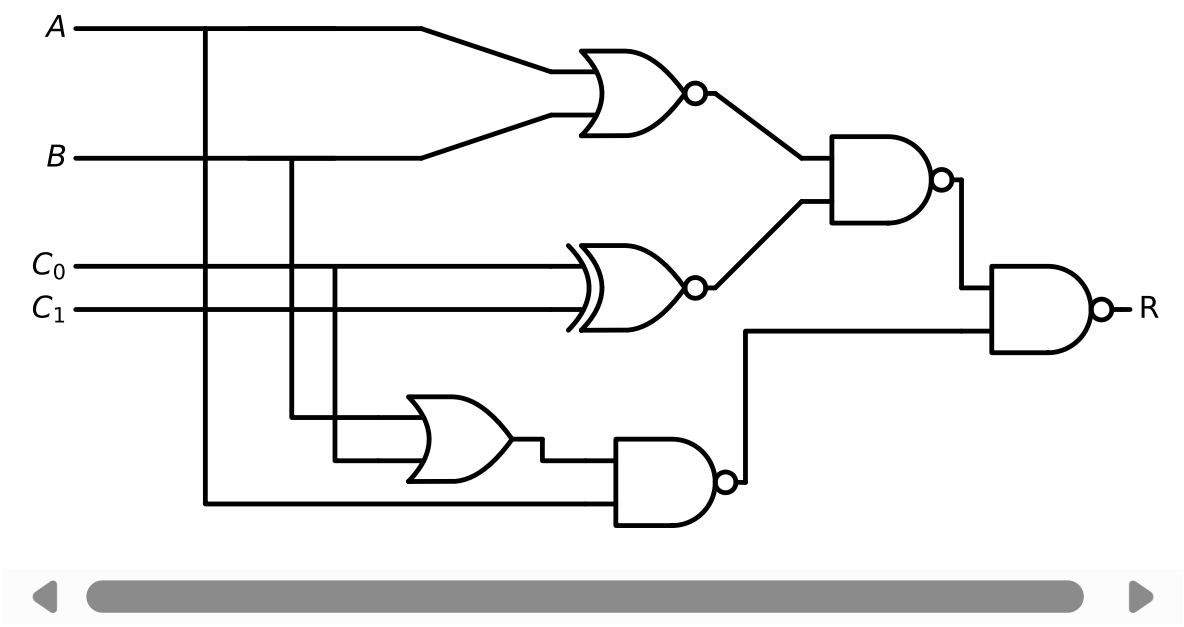
2.2 optimization with silicon

take a look at the silicon consumption table

$INVERTOR$	3
NAND,NOR	4
AND,OR	6
XAND,XOR	8

so if possible use NAND instead or OR(invert it twice), the XOR should not be replaced

then it should be



the silicon score for this circuit is 34, this is probably the best I can do