Lab 1

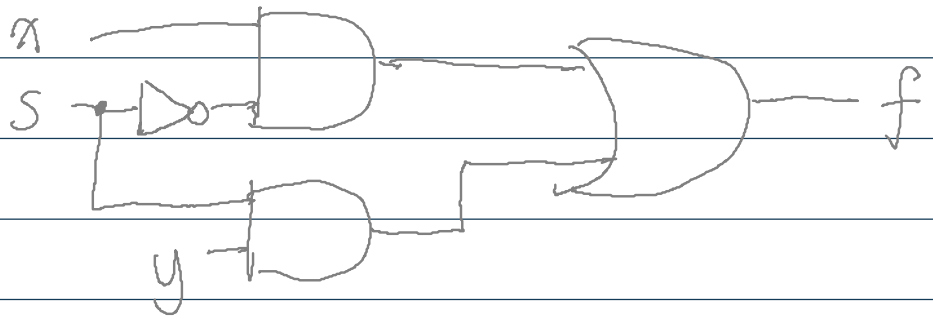
May 11, 2021 6:41 PM

Part I

Multiplexer boolean function

$f = xs' + ys$

1. Gate diagram



2. Truth table

x	y	s	f
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

Part II

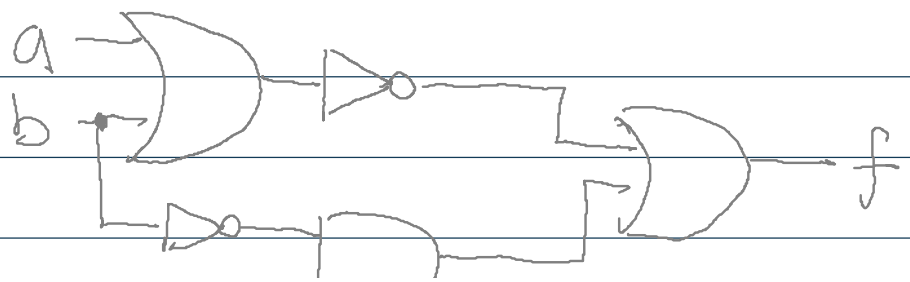
Boolean expression

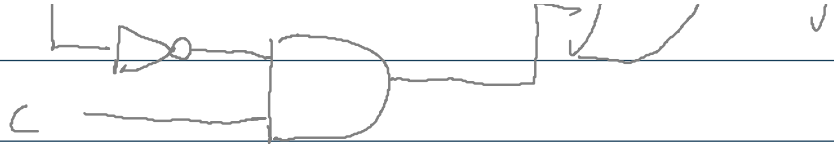
$f = (a+b)' + cb'$

2. Truth table

a	b	c	f
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

1. Gate diagram





3. Cheaper design

$f = (a+b)' + cb'$

$= a'b' + cb'$ [De Morgan's law]

$= (a'+c)b'$ [Distributive property]

↳ uses 4 gates instead of 5