HW3a

107061123 孫元駿

- 1. Use DeMorgan's theorem to remove the complement outside the braces:
 - (a) ((x+w')'+w'y'z+(x+z)'(x+y))',
 - (b) (x(yz'+y'z)'+wy(y'+x'z))',
 - (c) (x+y)'+z'(x'+z)'.

 $a_1 ((x+w')' + w' y' z + (x+z)' (x+y))'$



 a_2 (x+w')(w+y+z')(x+z+x'y')

		0.003 vs									
Name	Velue	0 ns	lan ns	40 ns	60 ns	80 ns	100 ns .	1120 os .	1140 ps	160 os . I	180 ns .
Tile Ores			17	11000	77771	37		777		P. T. I	77.7
16 ₩											
16. X											
16. Y											
U Z											

W	Х	У	Z	out
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

For each problem, use Verilog to simulate the two logic functions before and after brace removal for function verification.

b_1 (x(yz' +y' z)' +wy(y' +x' z))'

		0.003 ns									
Name	Value	0 mz	20 mz .	140 mr .	160 na .	180 mr .	100 nr .	120 nr .	140 mr .	160 ns .	1180 nz .
Un Out	1										
18 W	0										
18. X	0										
1ª Y	0										
1 <u>a</u> Z	0										

 b_2 (x' +yz' +y' z)(w' +y' +y(x+z'))

Name	Velue	0 nr	120 mr	lan we	len we	lan ne	lim or	100 mr	Itan we	160 nr	180 mr
1 in Out	0		7777	777.	7.77		77.77		10000	77.7	1777
1≜ W	1										
Th X	1										
Th Y	1.										
16 Z	1										

W	X	У	Z	out
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

$$c_1$$
 (x+y)' +z' (x' +z)'

		0.000 ns									
Name	Value	0 va	bn w	lan ne	len os	Im wa	ltm w	1120 mg	han we	lten va	lim ne
Ve Out	1			777	7.77.						77.77.1
15 X	0										
V all	0										
15 Z	0										

		0.000 ns									
Name	Value	0 ns	20 ns .	40 ns	60 nc .	lao ns	ltoo ns	120 ns .	140 ns .	1160 ns	1180 ns .
18 Out	ī			1771	77	477					
18. X	0										
¥ Y	0										
1 <u>6</u> Z	0										

w	х	у	Z	out
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0