HW3a

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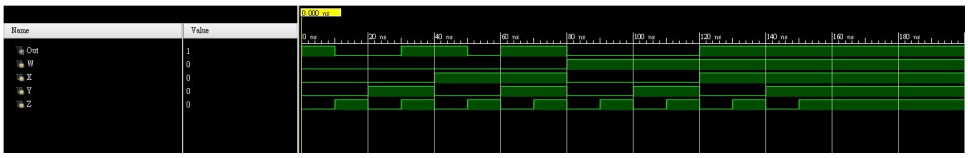
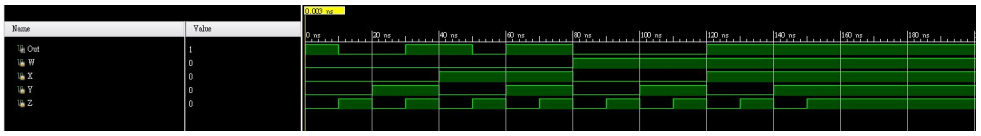
1. Use DeMorgan's theorem to remove the complement outside the braces:
   (a) ((x+w')'+w'y'z+(x+z)'(x+y))',
   (b) (x(yz'+y'z)'+wy(y'+x'z))',
   (c) (x+y)'+z'(x'+z)'.

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



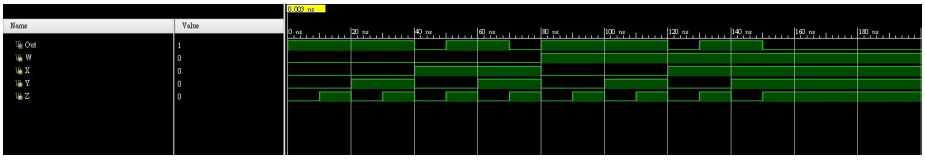
a_2 (x+w')(w+y+z')(x+z+x'y')



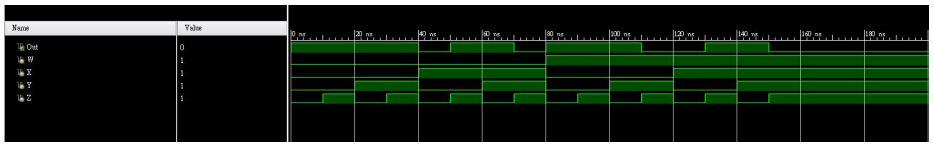
w	x	y	z	out
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

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))’

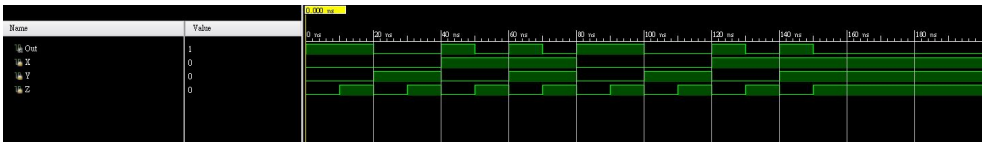


b_2 (x’ +yz’ +y’ z)(w’ +y’ +y(x+z’))

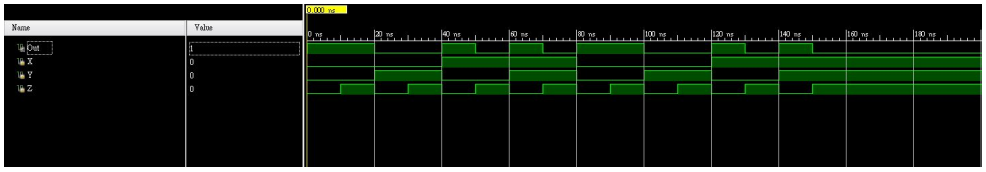


w	x	y	z	out
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

c_1 (x+y)’ +z’ (x’ +z)’



c_2 x’ y’ +xz’



w	x	y	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