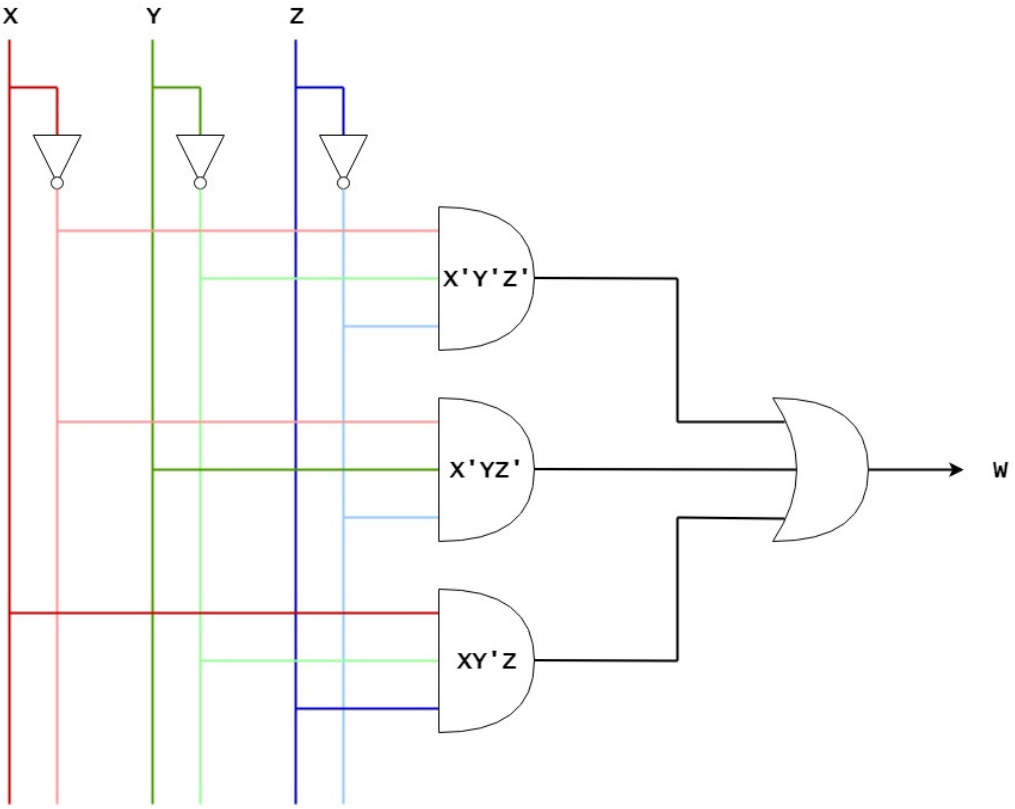
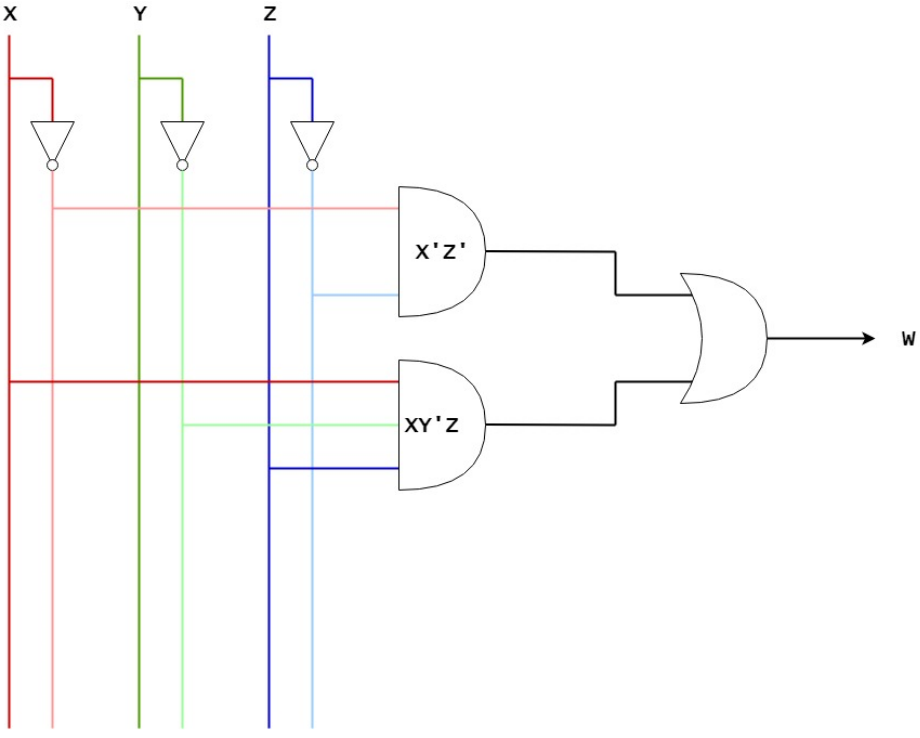
CISC 260 Machine Organization and Assembly Language

Assignment # 2 Solution

1. $W = X'Y'Z' + XY'Z + X'YZ'$



Simplified solution: $W = X'Z' + XY'Z$



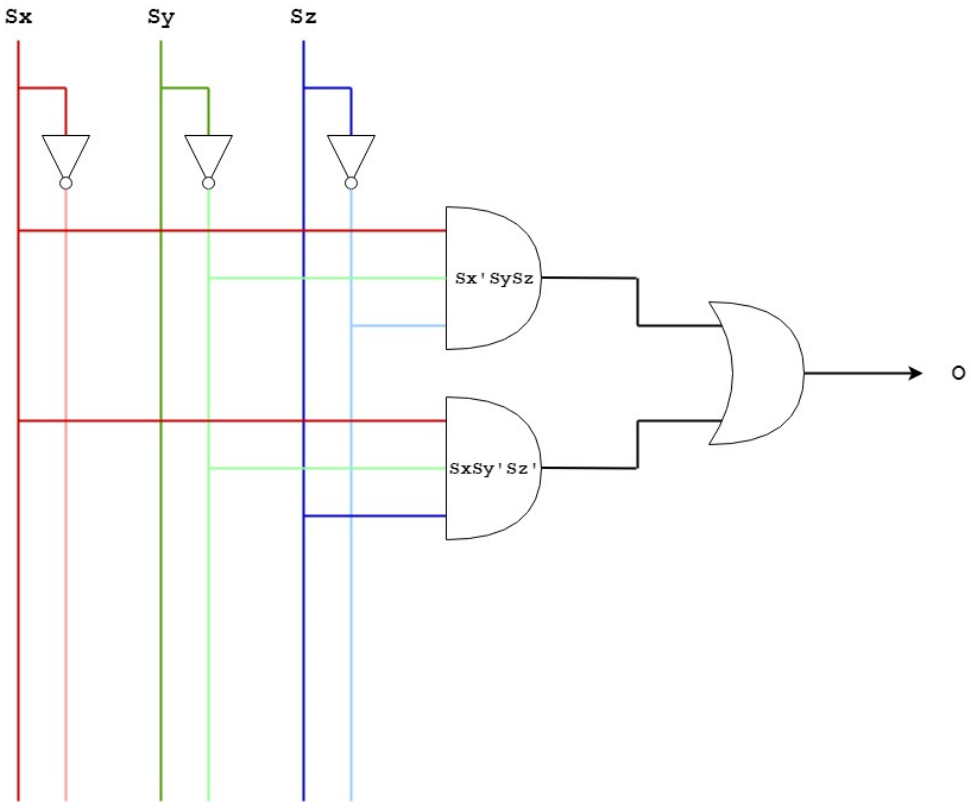
2. $Y = B'C' + AB'$
   $= B'(A + C')$

A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

3. 2's complement subtraction:
   a. Truth table:

S_x	S_y	S_z	O
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	0
1	1	1	0

   b. $O = S_x'S_yS_z + S_xS_y'S_z'$
   c. Circuit diagram:



4. It is sufficient to show that any of the universal gate can be generated by the set of gate types {LT, NOT}.

$$A \textbf{ NAND } B = \textbf{NOT}((\textbf{NOT } A) \textbf{LT } B)$$
$$A \textbf{ NOR } B = \textbf{NOT}(A \textbf{ LT } (\textbf{NOT } B))$$

Otherwise, you can show how you can generate the **AND** gate and **OR** gate using only **LT** and **NOT** gates.

$$A \textbf{ AND } B = (\textbf{NOT } A) \textbf{LT } B)$$
$$A \textbf{ OR } B = \textbf{NOT}(A \textbf{ LT } (\textbf{NOT } B))$$