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Class Group: COMP1D-X

Lab 8 – K-Maps

Q1.
  i)   Before simplifying, what is the Boolean expression for the truth table outlined below?

  ii)   Simplify using K-maps and design a circuit for the simplified expression. Draw the K-map below.

  iii) Verify its operation using the simulator and paste a snapshot of your circuit below.

Truth Table:

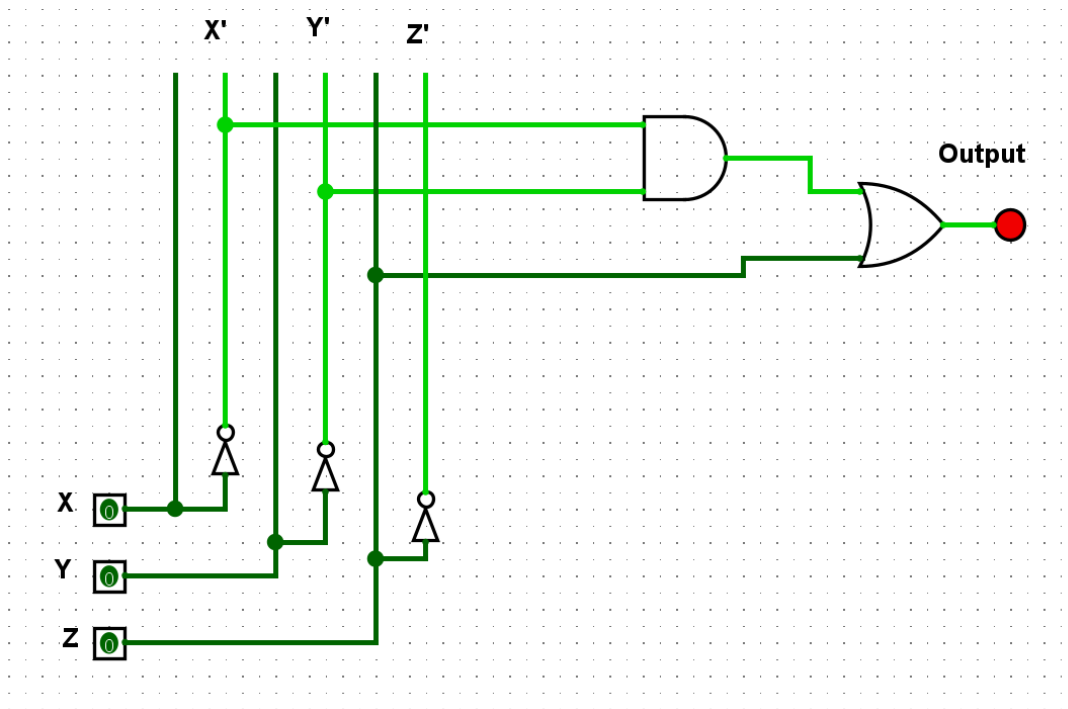| X	Y	Z	Output
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

Output = X'Y'Z' + XYZ'+ X'YZ+ XY'Z+ XYZ

K-Map:

Output = X'Y' + Z

Circuit

Q2.

i)   Design and simplify, using K-maps, a circuit for the following truth table. Draw the K-map below.

ii)   Verify its operation using the simulator and paste a snapshot of your circuit below.
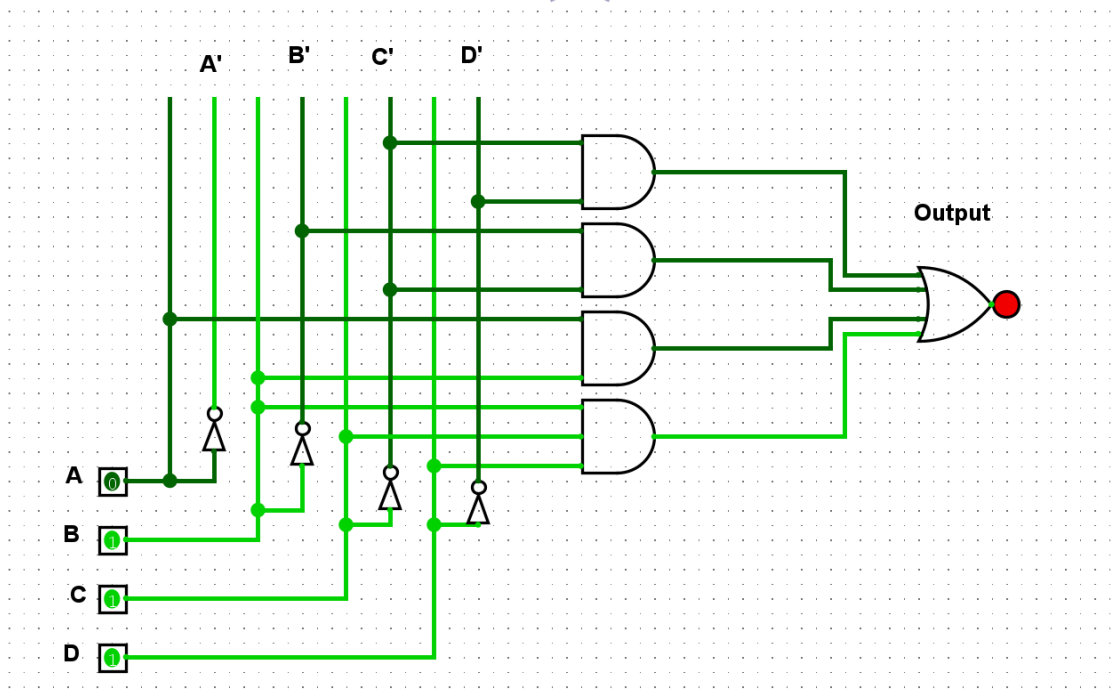
Truth Table:

A	B	C	D	Output
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	0
0	1	1	1	1
1	0	0	0	X
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	X
1	1	1	0	1
1	1	1	1	1

K-Map:

Output: C'D' + B'C' + AB + BCD

Circuit

Q3.

i)   Design and simplify, using K-maps, a circuit for the following truth table. Draw the K-map below.

ii)   Verify its operation using the simulator and paste a snapshot of your circuit below.

Truth Table:

X	Y	Z	Output
0	0	0	X
0	0	1	X
0	1	0	1
0	1	1	X
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

K-Map:

Output: $X' + YZ + Y'Z'$

Circuit