

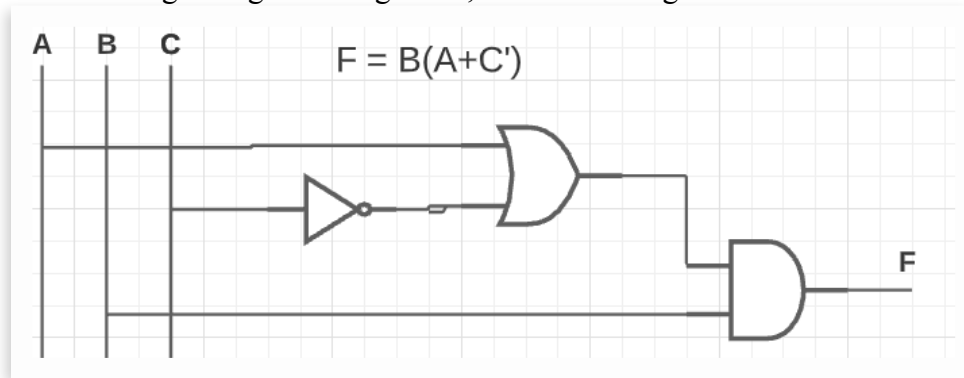
Homework 5 Vitaliy Prymak

1. All NOR Gate Implementation

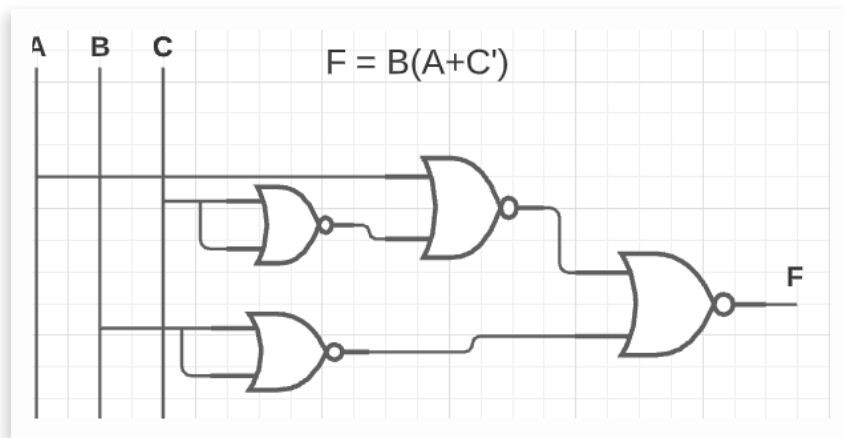
a) Rewrite the function as the Product of Sums format

i. $F = AB + BC' = B(A+C')$

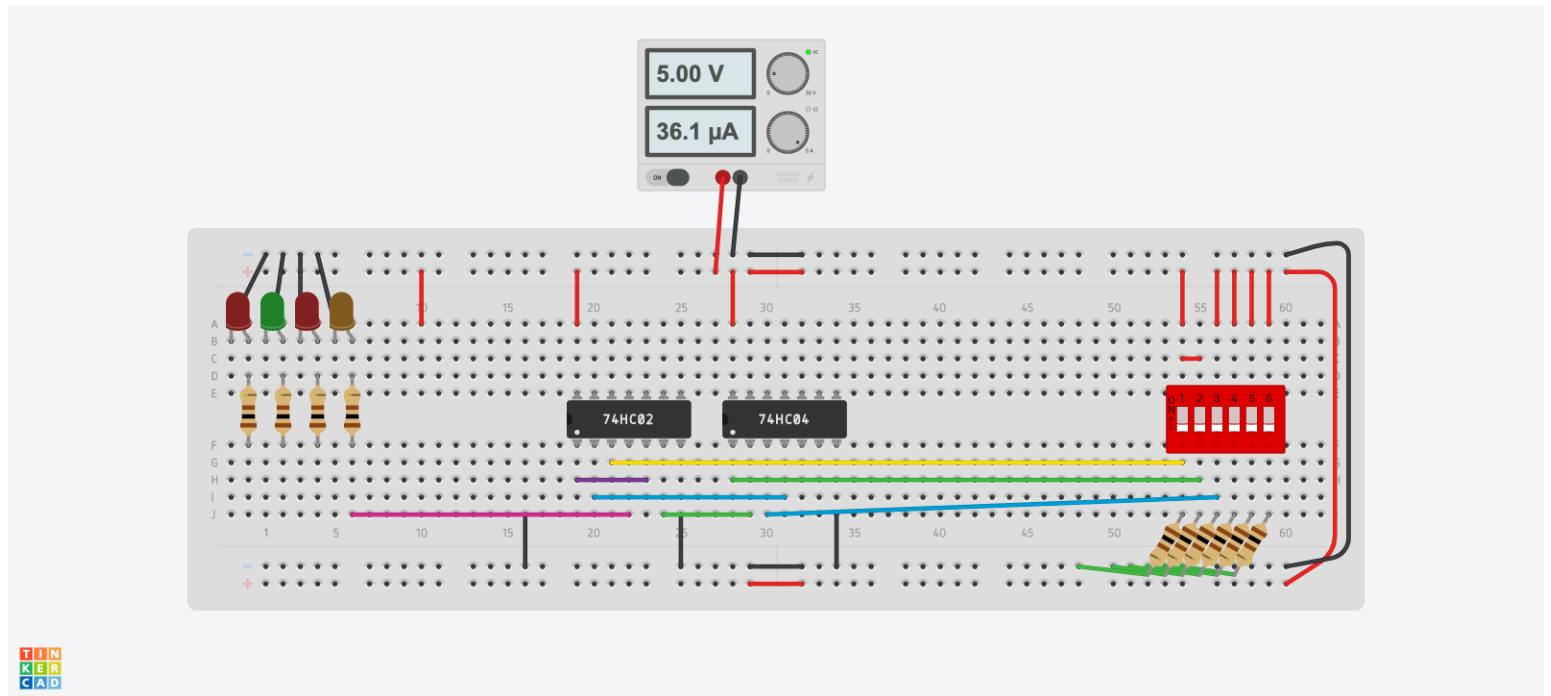
b) Draw the logic diagram using AND, OR and NOT gates:



c) Convert the circuit diagram to **all NOR gates implementation**.



https://www.tinkercad.com/things/1RFfnX5V9QE-copy-of-csc-347-starter-kit/editel?sharecode=knkYF36SWhqRd2quPR-A71GvMpB7dbLKHKDagx-F_TU



0 0 0 = 0

0 0 1 = 0

0 1 0 = 1

0 1 1 = 0

1 0 0 = 0

1 0 1 = 0

1 1 0 = 1

1 1 1 = 1

Homework 5 Vitaliy Prymak

2. Odd Parity Bit Checker

The parity checker circuit takes 4 input bits, x, y, z, and P, and produce one output error bit E. $E = 0$ if no error and $E = 1$ otherwise.

(a) Obtain the truth table for a 4-bit odd parity checker function E

x y z P	E
0 0 0 0	1
0 0 0 1	0
0 0 1 0	0
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

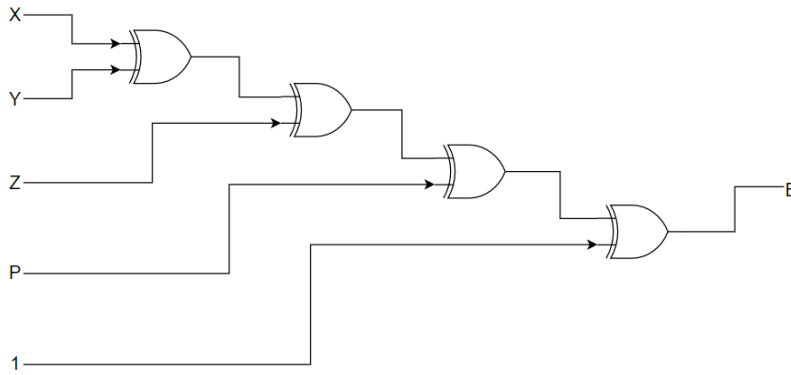
x y z P	E
1 0 0 0	0
1 0 0 1	1
1 0 1 0	1
1 0 1 1	0
1 1 0 0	1
1 1 0 1	0
1 1 1 0	0
1 1 1 1	1

(b) Derive the Boolean function for E using **XOR operation only**.

$$E = (X \oplus Y \oplus Z \oplus P)'$$

(c) Draw the logic diagram using XOR gates only.

Homework 5 Vitaliy Prymak



<https://www.tinkercad.com/things/5fA70IHL12K-copy-of-csc-347-starter-kit/editel?sharecode=24ZJuGyUSBucxRmyXt9xiL-01C-3uz19Gm0wZTHciBU>

