

CS 1511 Homework 19

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Wednesday, March 27

37.

38. The Toffoli gate takes 3 bits. If the first bit are set 1, it performs a NOT on the third bit. Otherwise, they stay the same.

It is Universal.

NOT = 1, 1, A -> performs NOT A.

AND = $I_1, I_2, 0$ -> performs an AND on I_1, I_2

We can make a NAND gate because we take an AND gate and a NOT gate after that.

OR = OR can be built from a NAND gate (NOT AND). Take the two inputs and put them into two NAND gates. Take the outputs of those NAND gates and input them into another NAND gate. This will output the value of an OR gate.

39.

40.

41.