

Introduction to Computer Science E13 – Study Groups – Week 37

1. Consider the Boolean formula $(a \wedge b \wedge \bar{c}) \vee (\bar{a} \wedge b \wedge c)$. Write a truth table for it Draw a circuit for it. Try to write a smaller formula and circuit for it. (Note that \bar{x} is the same as $\neg x$.)

(Note that this formula is in what is called Disjunctive Normal Form (DNF). The parts inside parentheses are called clauses. Each clause consists of some variables and/or complements of variables (literals), combined with ANDs, and the clauses are combined with ORs.)

2. In your group, create a game for another group. On separate sheets of paper, write Boolean formulas, their corresponding truth tables, and circuits for them. Have one with two variables, two with three, two with four, and two with more. Create seven of them in all, four of which are in DNF, so that you have 21 sheets of paper in all.
3. From the game you get from another group, match up the formulas, truth tables and circuits.
4. Discuss the ease or difficulty of going from a formula to a circuit, vs. the ease or difficulty of going from a circuit to a formula.
5. Discuss questions 2, 4 and 5 on page 30 of the textbook.