

Instructions

Rules for Completing the Problem

When solving this problem you may only reference course artifacts, including the lecture notes and recordings, textbook, and any notes/solutions you have handwritten during the course and prior to the quiz. Communicating with others (whether inside or outside of class) or finding solutions online is considered cheating and is grounds for receiving an F grade for the class. Show all necessary work!

Submitting your work

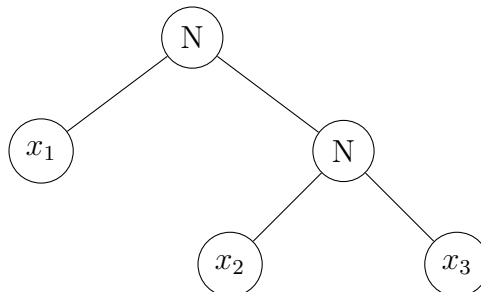
Submit a single file with your handwritten solution to the appropriate drop box by 10:00 am. Make sure you provide your name and SID in the upper-right corner of your solution.

Late submissions

Should you submit after the dropbox deadline, solutions received no later than 10 minutes after the deadline will lose 20% of the earned points. Solutions received between 11 and 20 minutes after the deadline will lose 50% of the points. All other late submissions will not be graded.

Problem 6

Consider a Boolean formula F whose parse tree is shown below.



Here N stands for “Nand”, meaning that every internal node is a nand gate. Show that, in the reduction from SAT to 3SAT via the Tseytin transformation, F is mapped to an instance of 3SAT for which each clause either has all positive literals or all negative literals. (25 pts)