Circuit Schissiability Problem

問題: 给定- boolean combinational circuit,有一个以上的 combinational element 用 wire 相連

而裡頭之 bgic element 只有 NOT, AND, OR

和 - 组 input < X1, ..., Xi >

星否存在一种 assign ment 使得該 boolean combinational circuit 2 output 为1

Example.

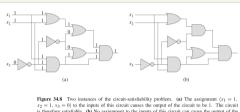


Figure 34.8 Two instances of the circuit-satisfiability problem. (a) The assignment $(x_1 = 1, x_2 = 1, x_3 = 0)$ to the inputs of this circuit causes the output of the circuit to be 1. The circuit is therefore satisfiable. (b) No assignment to the inputs of this circuit can cause the output of the circuit to be 1. The circuit is therefore unsatisfiable.

Analysis: 给定 inchance size 需考度: continutional element 数 多為 k

CIRCUIT-SAT = $\{\langle C \rangle : C \text{ is a satisfiable boolean combinational circuit} \}$.

證明: Circuit - SAT 為NPC (略)

- O. CSATE NP
- 9. Yx ∈ NP, x ≤ CSAT