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Complexity of Boolean functions

SS 2019

Homework 6

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Exercise 1:

Consider the proof of Theorem 3.8 of the lecture.

- a) Show that setting a_0 to 0 eliminates those $s_0 \wedge$ -gates where the outputs f_i with $f_i = a_0 b_j$ for a j are computed.
- b) Show that the property “ P contains no \vee -gate v_l with $a_i b_j \leq \text{res}_\beta(v_l)$ for an $i \neq 0$ and some j ” implies that f_k does not contain two prime implicants.

Exercise 2:

Consider the construction of the network β_1 from the network β_0 for the convolution as presented in the lecture. Prove that after the realization of an \wedge -gate u , the properties i) – iii) are fulfilled for the network δ_u .