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Complexity of Boolean functions
SS 2015
Homework 1

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Exercise 1:

a) Prove Lemma 1.1 of the lecture.

b) Show that $C^*_{\Omega_0}(B_2) \leq 12$.

Exercise 2:

a) Show $|B_n| = 2^{2^n}$ and $|B_{n,m}| = 2^{m2^n}$.

b) Prove $t! \geq (\frac{t}{3})^t$. (Hint: Use Stirling's formula.)

Exercise 3:

Prove for n large enough that B^*_n contains a function which needs more than $\frac{2^n}{n}$ gates.

Exercise 4:

For the lower bound proof (Theorem 1.1) we have chosen the base Ω_0. Which lower bound could you prove if you would choose the base B_2 instead of Ω_0?