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## Complexity of Boolean functions

SS 2018

### Homework 8

25.06.2018

#### Exercise 1:

Disprove that  $C^* \setminus C = \{W \notin C \mid C \vdash W\}$ .

#### Exercise 2:

- a) Develop an algorithm for the computation of all prime clauses for a given function  $f \in M_n$ .
- b) Is it possible that a prime clause contains more than one variable of a prime implicant of  $f$ ? Prove your answer.

#### Exercise 3:

The disjunction of all prime implicants of a function  $f \in M_n$  is the *P-DNF representation* of  $f$ . The conjunction of all prime clauses is the *P-CNF representation* of  $f$ .

- a) Develop an algorithm which given the P-CNF representation of  $f \in M_n$  computes the P-DNF representation of  $f$ .
- b) For  $f \in M_n$  show that the P-DNF- and also the P-CNF representations are unique.