One of the most fundamental problems of the proof complexity theory is to find for classical propositional calculus a proof system, which has a polynomial size $p(n)$ proof for every tautology of size $n$. Cook and Reckhow named such a system a super system and showed in [1] that $NP = coNP$ iff a super system exists. Lately it is proved in [2] that $NP = coNP = PSPACE$, hence a super system must be. It is well known that many systems are not super. This question about Frege system, the most natural calculi for propositional logic, is still open.

Some results about Frege proof complexities are presented here. We introduce the notion of specific tautologies $A$ in the form: $A = p \supset (A_1 \lor A_2 \lor \cdots \lor A_k)$ ($k \geq 1$), where $p$ is a literal (variable or negation of variable), neither $A_1 \lor A_2 \lor \cdots \lor A_k$ nor every $A_i$ ($1 \leq i \leq k$) are tautology or contradiction and $|A_i| \leq \frac{|A_1|}{2^{i-1}}$, and show that Frege systems are super systems iff there is a polynomial $p()$ such that all specific tautologies of size $n$ have a proofs, size of which are bounded by $p(n)$. Then we show, that all balanced tautologies (every variable of which has only one positive and one negative occurrences), given in disjunctive normal form, also have Frege proofs with polynomial bounded sizes. Lastly we give some notes about relations between the proof complexities of tautologies $A_n$ and $B_n$ and proof complexities of the tautologies in a form $A_n \ast B_n$, where $\ast$ is $\land$, $\lor$, $\supset$. In particular we show that for some tautologies $A_n$ and $B_n$ proofs of formulas $A_n \lor B_n$ can be more easier than proofs every of $A_n$ and $B_n$.

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