Horn (Renamable) instances

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1 Introduction

$\mathcal{QHF}$ denotes Quantified Horn Formulas. The matrix of a $\mathcal{QHF}$ contains clauses with at most one positive literal. ren$\mathcal{QHF}$ denotes Renamable $\mathcal{QHF}$. A set of clauses is renamable Horn if and only if there exists a uniform renaming of the literals such that the formula becomes Horn after the renaming. We constructed two generators for $\mathcal{QBF}$s: one of $\mathcal{QHF}$ instances, the other of ren$\mathcal{QHF}$.

2 Form of benchmarks

$\mathcal{QHF}$ (resp. ren$\mathcal{QHF}$) benchmarks are instances of the form
horn_[#V]CNF[#C]_[#A][Q]QBF_[#C].qdimacs.gz
(resp. renHorn_[#V]CNF[#C]_[#A][Q]QBF_[#C].qdimacs.gz) where:

– #V (resp. #C, #A): number of variables (resp. clauses, alternations),
– Q: e (resp. a) if the outer quantifier is $\exists$ (resp. $\forall$),
– #C: the serial number of the benchmarks.

3 Construction

For $\mathcal{QHF}$s generation, the user chooses the size of the benchmark (number of variables, clauses, quantifier alternations, ...). Then, for each clause, we first randomly choose the size of the clause. Then, a literal is chosen to be the positive one in the clause. We complete it by randomly choosing the rest of negative literals.

ren$\mathcal{QHF}$s are generated in the same way. The difference is that we first chose the number of variables to be renamed then these variables are chosen before the generation of clauses. This is done with the same method as the one used for generating $\mathcal{QHF}$s but with the renaming of the chosen literals.

4 Selection

The proposed benchmarks are the non easy ones out of 30 000 generated $\mathcal{QHF}$s benchmarks and 3 000 ren$\mathcal{QHF}$s. The non easy instances are those not solved easily by some 2004 $\mathcal{QBF}$ evaluation competitors.