CSC 322 (Winter/Spring 2019) – Project One

README

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Submission Details

This submission contains three programs, `vcheck1`, `vcheck2`, `vcheck3`, and `vcheck4`. To execute these programs, you will need to invoke the `make` command. Each program has an associated `make` command:

- `make vcheck1`
- `make vcheck2`
- `make vcheck3`
- `make vcheck4`

The `vcheck1` program takes a single Boolean formula and determines whether or not it is valid. Like `vcheck1`, the `vcheck2` program also takes a single Boolean formula and determines its validity. However, if the formula is not valid, `vcheck2` prints a list of variable assignments which makes the formula false. Unlike the others, the `vcheck3` program takes a comma-separated list of Boolean formulae, then determines whether the last formula in the list is valid based on the assumption that all prior formulae are valid. Like `vcheck2`, `vcheck3` also outputs a list of variable assignments which makes the last formula false (but all the prior formulae true) if it is not valid. Finally, the `vcheck4` program takes a single Boolean formula and compares the execution of a minisat-based validity checker (basically `vcheck1`) against a brute force validity checker.

Note that the `make vcheck*` commands do not create executables. Instead, they simply call the Python 3 interpreter. Hence you can pipe input in, or output out, on the same line that `make vcheck*` is called.

The `vcheck*` programs accept all Boolean formulae that use round parentheses, disjunction (v), conjunction (&), material implication (->), or negation (~). All variables should be an "A" followed by a non-zero single-digit natural number, followed by zero or more single-digit natural numbers (as a regular expression, variables look like: A[1-9][0-9]*).

In addition to the `make vcheck*` commands, there is also the `make clean` command which cleans up the files created (or modified) by the `vcheck*` programs. These files include (but are not limited to) the `minisat_in` and `minisat_out` files. Note that the `minisat_in` and `minisat_out` files should not be removed. These files are staging grounds for use by minisat. If you would like to examine what goes into or comes out of minisat, you can open the files *after* (but not while) running any of the `vcheck*` commands.