

Logic Synthesis & Verification, Fall 2011

National Taiwan University

Programming Assignment 2

Due on 2011/12/14 before lecture

1 [Programming ABC]

Programming task:

Please write a procedure in the ABC environment to print the symmetry statistics of a given circuit with the following instructions.

1. Name the command `print_symmetry`.
2. Write your program in `abc.c` starting with a new function named `Abc_CommandPrintSymmetry`.
3. Use SAT-based computation to determine, for each PO, how many support variables and how many symmetric variable pairs it has.

Programming help:

1. Command `print_symm` implements a similar computation with BDD and Fraig based data structure.
2. Procedure `Abc_NtkDSat` in `src/base/abci/abcDar.c` shows an example of SAT solver usage.
3. Procedure `Cnf_DeriveSimple` is recommended for circuit to CNF conversion (easier to understand).
4. There are two main approaches to test symmetry: 1) construct proper miter and then translate to CNF for solving, and 2) translate circuit to CNF and modify the CNF for symmetry detection. Both approaches are fine. The latter might be simpler and easier to perform incremental SAT solving.
5. The second and third arguments of `sat_solver_solve` can be exploited for incremental SAT solving.

Items to turn in:

- (1) Your new file `abc.c`
- (2) A screenshot of ABC running your new command “`print_symmetry -v`” on example `s444.blif`.