

Programming Assignment 2

Submission Guidelines

Please send a pull request to the branch named with your student ID during the submission period (see below).

Before opening a pull request, please synchronize your local branch with the destination branch (namely, the branch with your student ID) to avoid merge conflicts.

Please develop your code under `./src/ext-lsv`.

Submission Periods

- 2020/12/10 11:00-13:00

1. [Testing Unateness of Primary Outputs]

(100%)

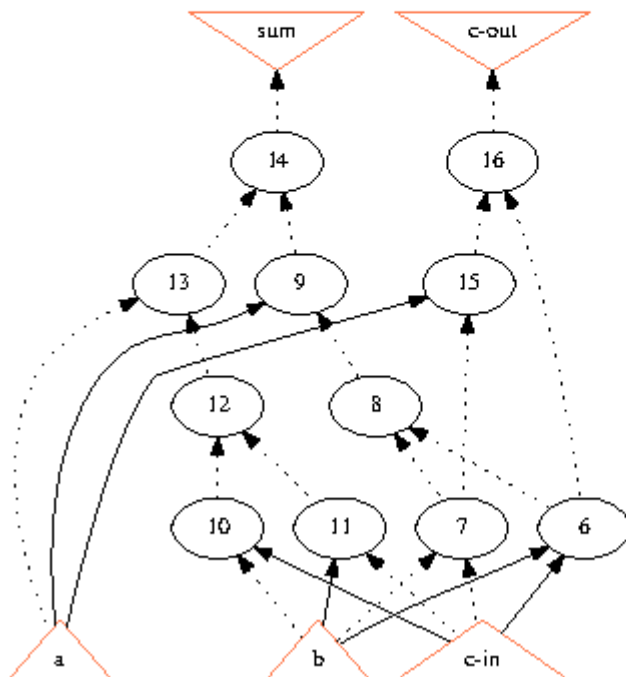
Write a procedure in ABC to print the unate information for each primary output in terms of all primary inputs, whose function is encoded as an and-inverter graph (AIG). Integrate this procedure into ABC, so that running command `lsv_print_pounate` will invoke your code. You can assume the input network given to your command is already converted into an AIG.

We say that a primary output f is *positive unate* in terms of a primary input x if its function F (encoded by the AIG) satisfies $F(\dots, x=0, \dots) \rightarrow F(\dots, x=1, \dots)$. Similarly, f is *negative unate* in terms of x if F satisfies $F(\dots, x=1, \dots) \rightarrow F(\dots, x=0, \dots)$. Moreover, f is called *binate* in terms of x if f is neither positive nor negative unate in terms of x .

As an example, for the following AIG,

Network structure visualized by ABC
 Benchmark "full_adder". Time was Wed Sep 23 16:57:56 2020.

The network contains 11 logic nodes and 0 latches.



your program prints:

```

node sum:
binate inputs: a,b,c-in
node c-out:
+unate inputs: a,b,c-in

```

To ease the grading process of your code, please print the primary outputs in the order of `Abc_NtkForEachPo()`. Please print the names of primary inputs returned by function `Abc_ObjName()` in a single line, separate their names with commas, and sort them in an increasing order with respect to their object IDs returned by function `Abc_ObjId()`. If there is no satisfying primary input for a certain unateness, please do not print an empty line. That is, for example, if there is no binate primary input of a primary output, do not print such line

```

binate inputs:

```