

# 邏輯合成與驗證 PA1

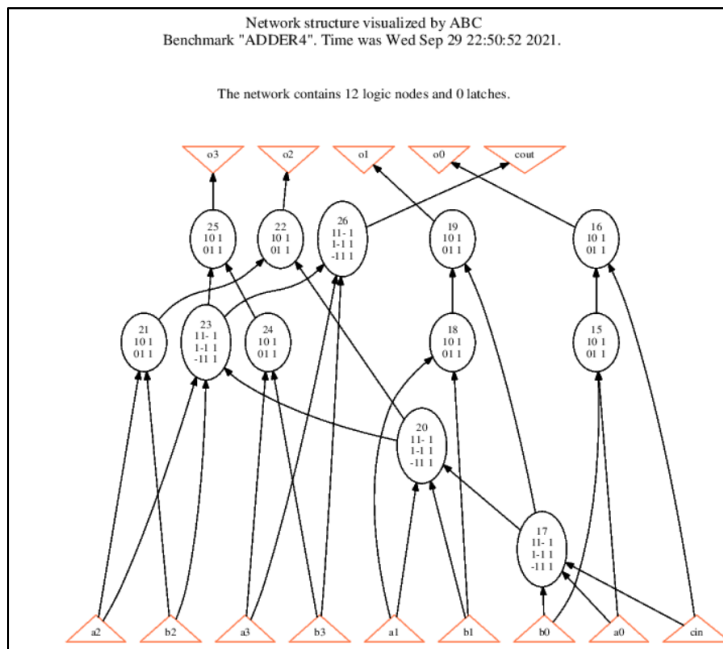
B07901103 電機四 陳孟宏

## PART 1

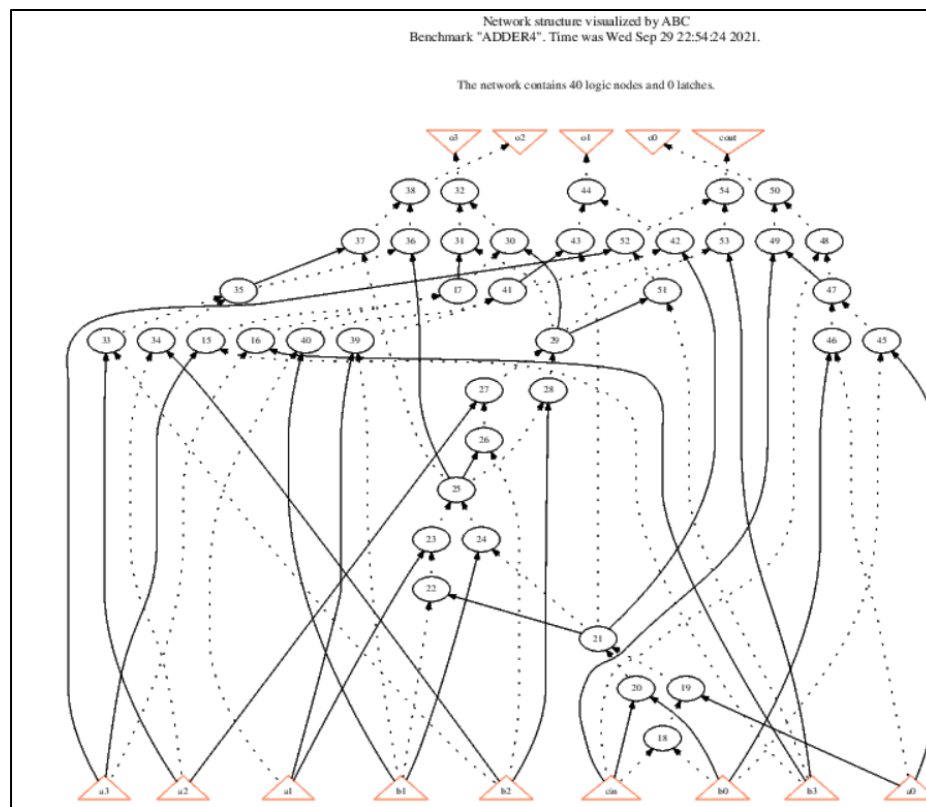
### [Step 1~7 : Command Execution]

```
HugoChen@cuthulhu: ~/LSV/PA1/al
HugoChen@cuthulhu:~/LSV$ cd PA1/
HugoChen@cuthulhu:~/LSV/PA1$ cd abc_tool/
HugoChen@cuthulhu:~/LSV/PA1/abc_tool$ ./abc
UC Berkeley, ABC 1.01 (compiled Sep 23 2021 19:42:47)
abc 01> read ../4_bit_adder.blif
Line 13: Skipping line ".search ADDER.blif".
Hierarchy reader flattened 4 instances of logic boxes and left 0 black boxes.
abc 02> print_stats
ADDER4                                     : i/o =   9/   5 lat =   0 nd =  12 edge =   28 cube =   28 lev =  4
abc 02> show
abc 02> Warning: Missing charsets in String to FontSet conversion
quit
HugoChen@cuthulhu:~/LSV/PA1/abc_tool$ ./abc
UC Berkeley, ABC 1.01 (compiled Sep 23 2021 19:42:47)
abc 01> read ../4_bit_adder.blif
Line 13: Skipping line ".search ADDER.blif".
Hierarchy reader flattened 4 instances of logic boxes and left 0 black boxes.
abc 02> strash
abc 03> show
abc 03> Warning: Missing charsets in String to FontSet conversion
quit
HugoChen@cuthulhu:~/LSV/PA1/abc_tool$ ./abc
UC Berkeley, ABC 1.01 (compiled Sep 23 2021 19:42:47)
abc 01> read ../4_bit_adder.blif
Line 13: Skipping line ".search ADDER.blif".
Hierarchy reader flattened 4 instances of logic boxes and left 0 black boxes.
abc 02> strash
abc 03> collapse
abc 04> show_bdd -g
abc 04> Warning: Missing charsets in String to FontSet conversion
quit
HugoChen@cuthulhu:~/LSV/PA1/abc_tool$
```

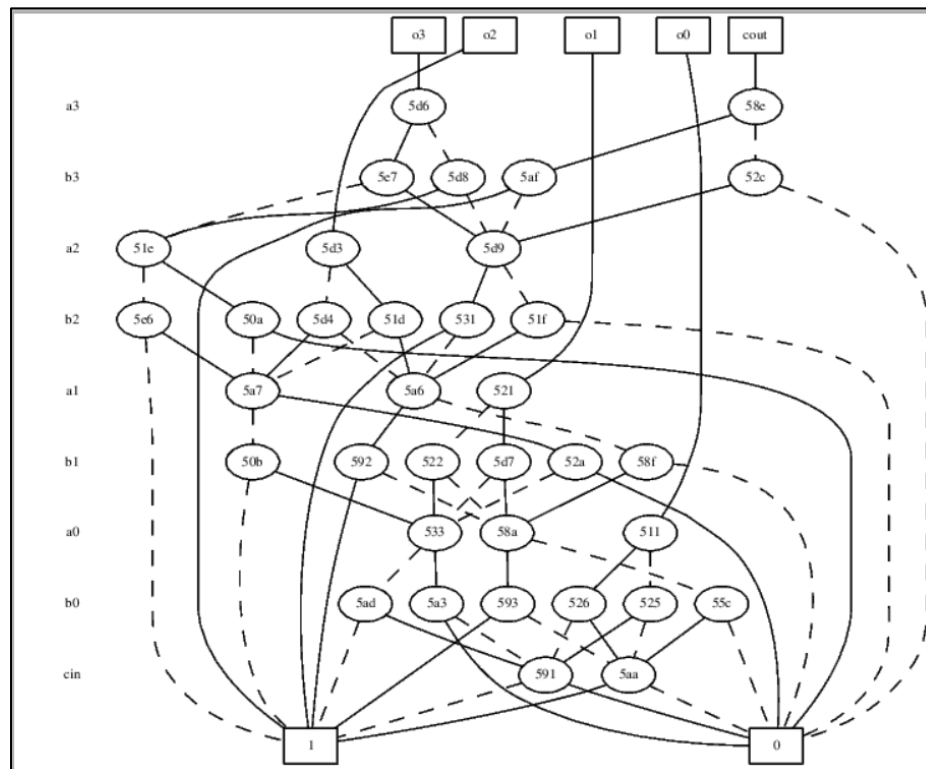
### [Step 3 : show before strash]



## [Step 5 : show after strash]



## [Step 7 : show BDD]

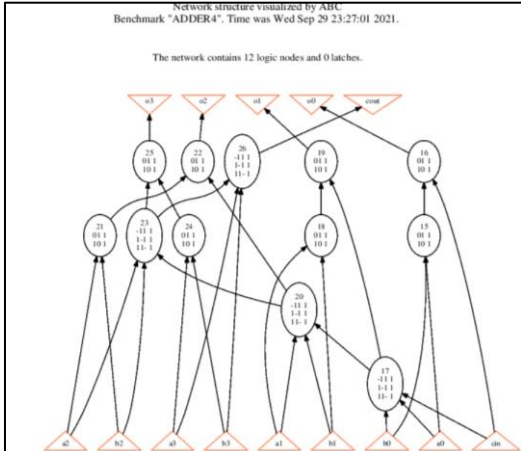
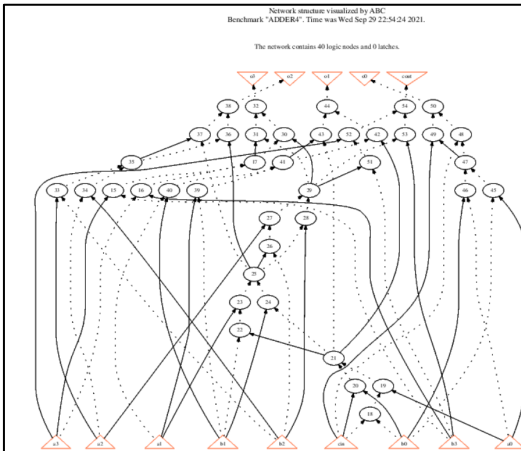


## PART 2

[a]

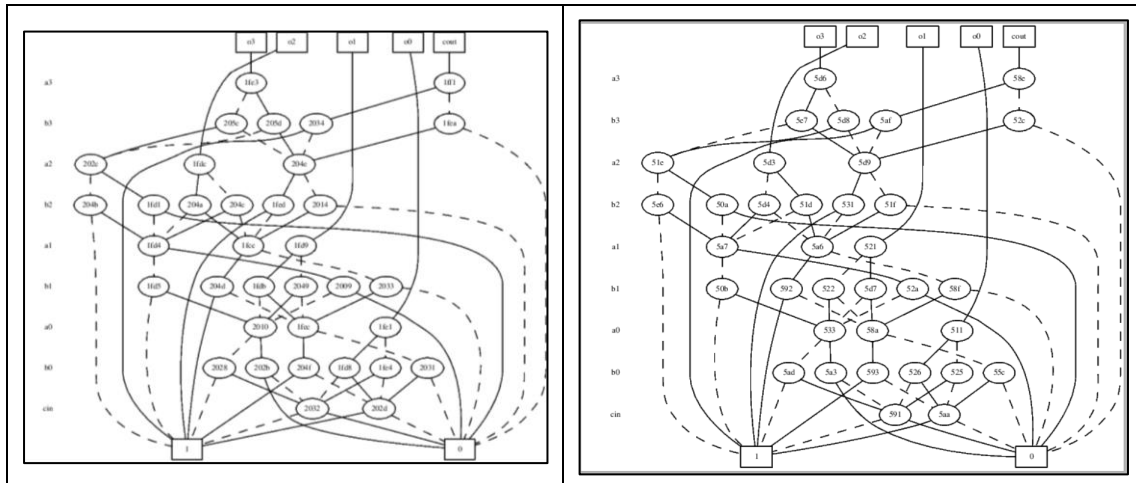
\* reference: <http://people.eecs.berkeley.edu/~alanmi/abc/abc.htm>

1.

Command “aig”	Command “strash”
<ul style="list-style-type: none"> <li>- Converts local functions of the nodes to AIGs</li> <li>- Unsorted</li> </ul>	<p>Transforms the current network into an AIG by one-level structural hashing. The resulting AIG is a logic network composed of two-input AND gates and inverters represented as complemented attributes on the edges. Structural hashing is a purely combinational transformation, which does not modify the number and positions of latches</p>
	

2.

Command “bdd”	Command “collapse”
<ul style="list-style-type: none"> <li>- Converts local functions of the nodes to BDDs</li> <li>- Unsorted</li> </ul>	<p>Recursively composes the fanin nodes into the fanout nodes resulting in a network, in which each CO is produced by a node, whose fanins are CIs. Collapsing is performed by building global functions using BDDs and is, therefore, limited to relatively small circuits. After collapsing, the node functions are represented using BDDs</p>



**[b]**

Command: **“logic”**

Function: Transforms the AIG into a logic network with the SOP representation of the two-input AND-gates