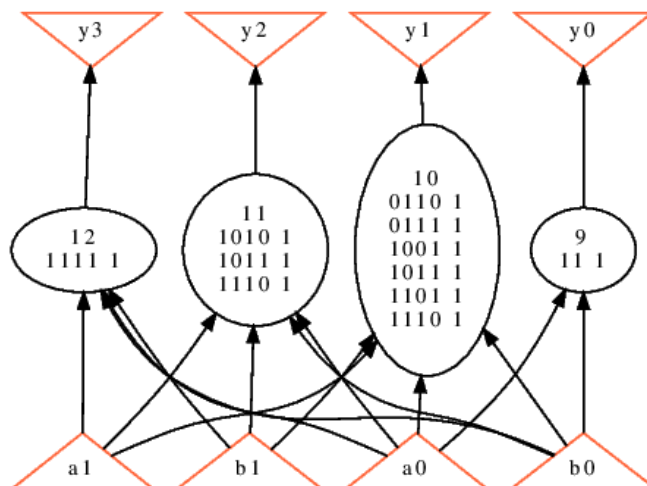


lsv report pa1 problem 2,3
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network structure:

Network structure visualized by ABC
Benchmark "mul". Time was Sun Sep 17 00:54:28 2023.

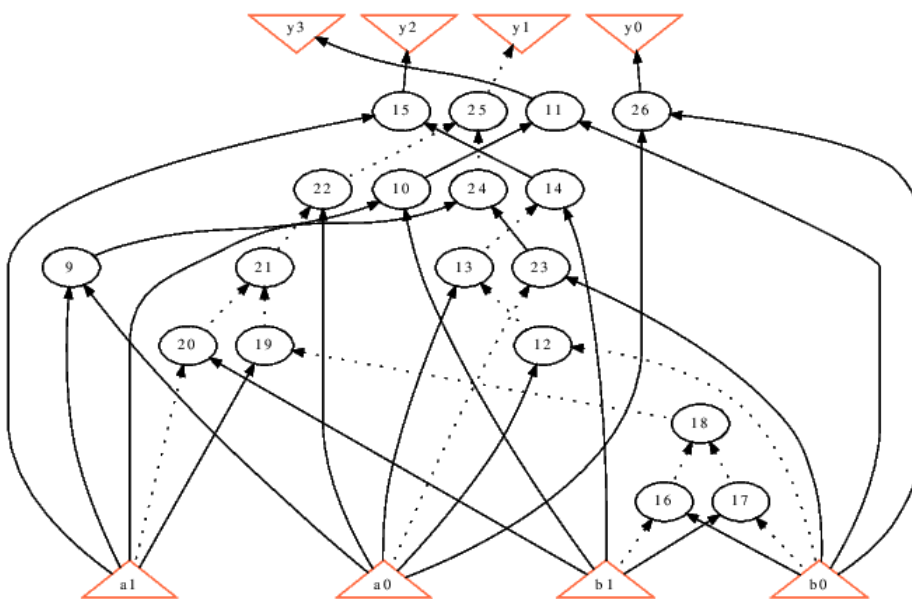
The network contains 4 logic nodes and 0 latches.



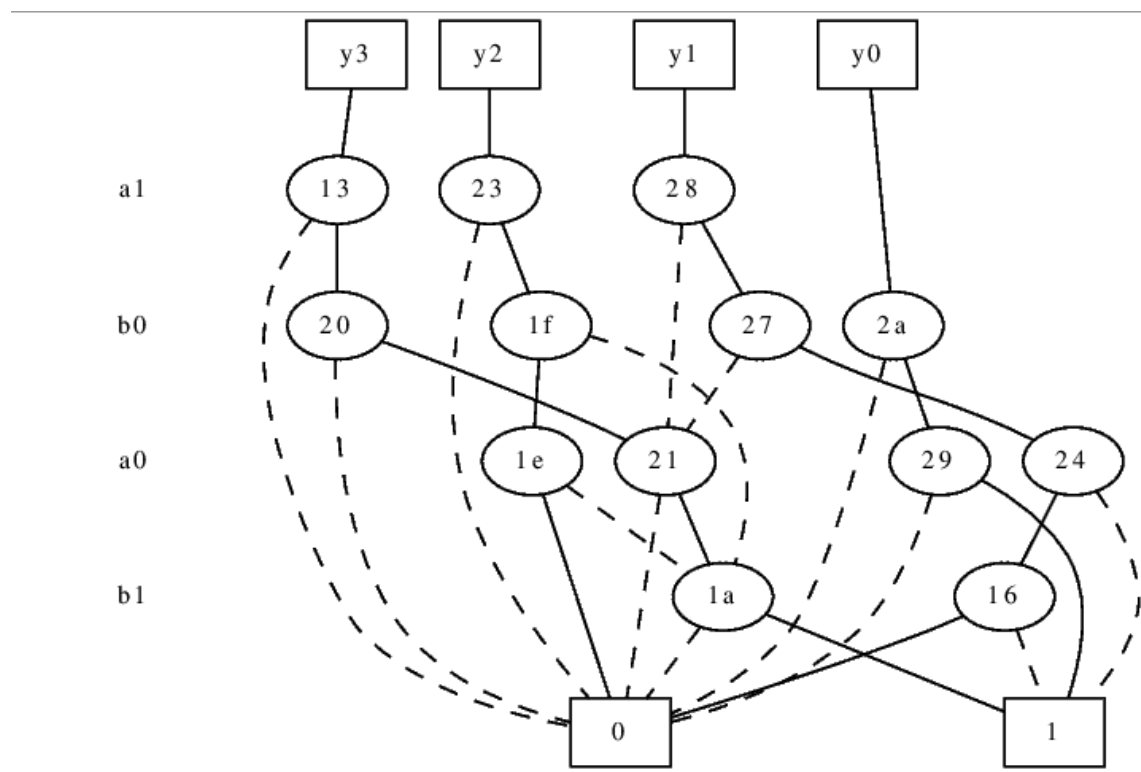
AIG:

Network structure visualized by ABC
Benchmark "mul". Time was Sun Sep 17 00:55:33 2023.

The network contains 18 logic nodes and 0 latches.



BDD:



3

(a)

1. "AIG" is the original and-inverter graph, and the "strash" make it simpler and smaller using structural hashing technique. With the strash command we can save some memory.

```
abc 05> read mul.blif
abc 06> aig
abc 06> print_stats
mul : i/o = 4/ 4 lat = 0 nd = 4 edge = 14 aig = 18 lev = 1
abc 06> strash
abc 07> print_stats
mul : i/o = 4/ 4 lat = 0 and = 18 lev = 6
```

2. It is the same idea with "strash" to "AIG". "Collapse" use recursive composing technique to make the node number less, so system memory could be saved.

```
abc 07> read mul.blif
abc 08> bdd
abc 08> print_stats
mul : i/o = 4/ 4 lat = 0 nd = 4 edge = 14 bdd = 17 lev = 1
abc 08> collapse
abc 09> print_stats
mul : i/o = 4/ 4 lat = 0 nd = 4 edge = 14 bdd = 14 lev = 1
```

(b.)

```
abc 04> read mul.blif
abc 05> sop
abc 05> show
```

Network structure visualized by ABC
Benchmark "mul". Time was Sun Sep 17 01:07:32 2023.

The network contains 4 logic nodes and 0 latches.

