LSV_PA1

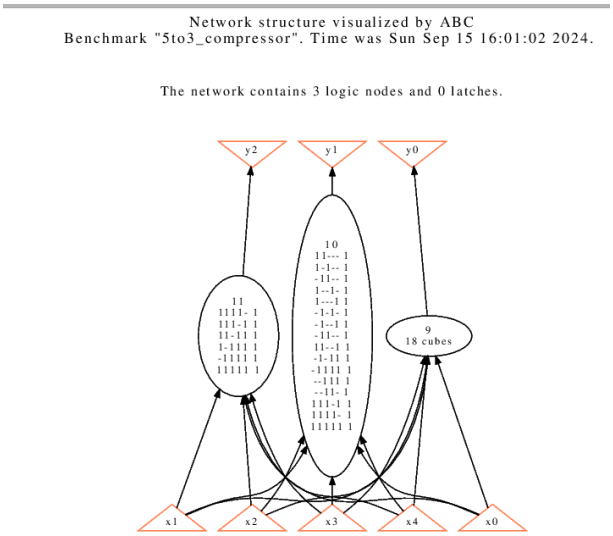
R13946004

Problem 2

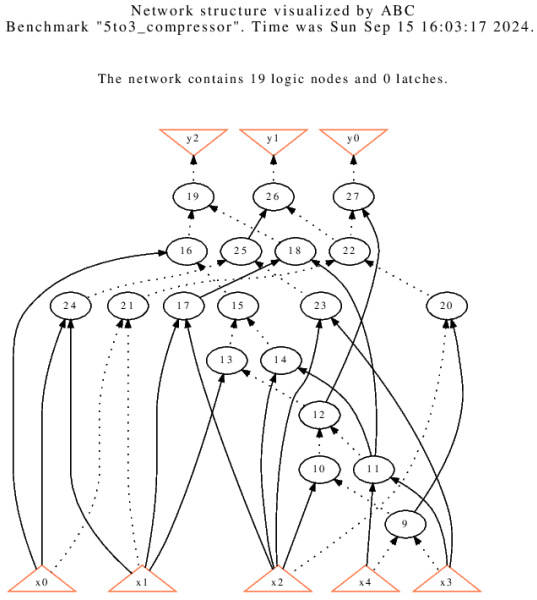
check statistics

```
abc 02> print_stats
5to3_compressor            : i/o =    5/    3  lat =    0  nd =     3  edge =     15  cube =    40  lev = 1
```

visualize the network structure



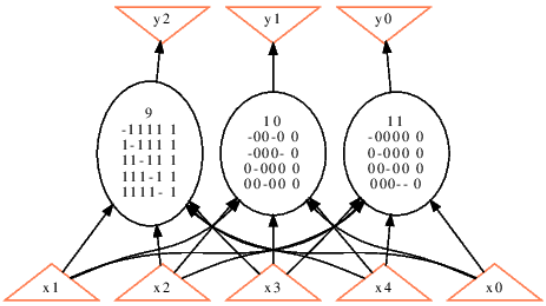
Convert to AIG



Convert to BDD

Network structure visualized by ABC
Benchmark "5to3_compressor". Time was Mon Sep 16 14:40:05 2024.

The network contains 3 logic nodes and 0 latches.



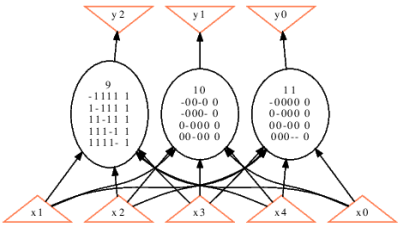
Problem 3

(a)

AIG

Network structure visualized by ABC
Benchmark "5to3_compressor". Time was Tue Sep 17 00:29:19 2024.

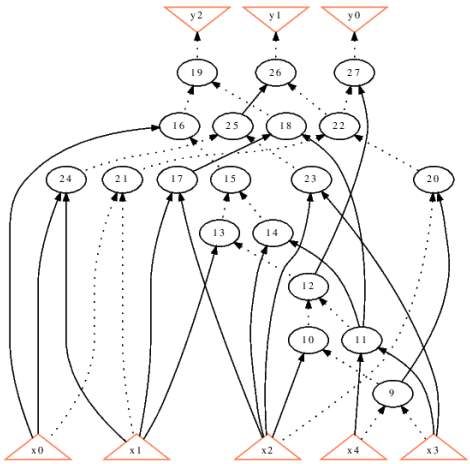
The network contains 3 logic nodes and 0 latches.



Hashed AIG

Network structure visualized by ABC
Benchmark "5to3_compressor". Time was Wed Sep 18 16:31:45 2024.

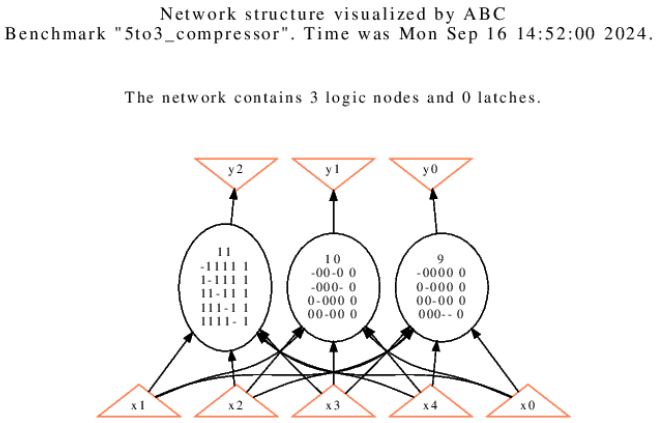
The network contains 19 logic nodes and 0 latches.



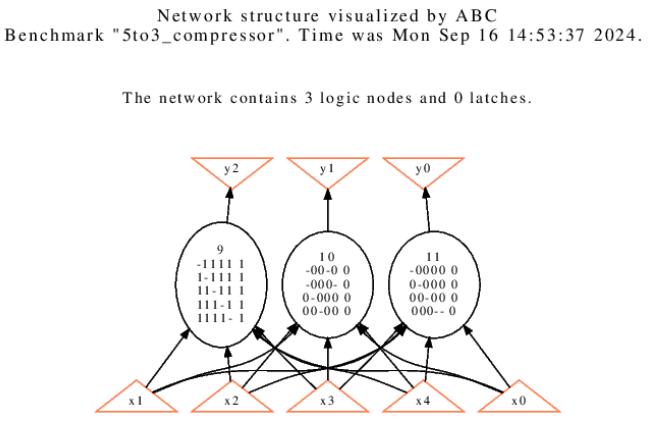
This could be an unoptimized AIG graph. It represents the logic circuit in its most basic form, showing different nodes and edges. Such a graph may contain redundant logic structures and may not reuse the same logic nodes efficiently.

This is an optimized AIG graph. While the number of nodes has increased, this might be due to a more detailed and comprehensive network with different logic combinations. In a Hashed AIG, the use of a hash table avoids redundant nodes by reusing existing logic nodes, thus reducing the need for duplicate computations.

Bdd



collaspe BDD



My BDD and collapse BDD are the same. I think because the logic circuit represented by this specific BDD might already be in its simplest form. As a result, collapsing the BDD does not produce any further optimization or change in structure.

(b)

Expressed in SOP