Report of PA1

R13943148 胡凱翔
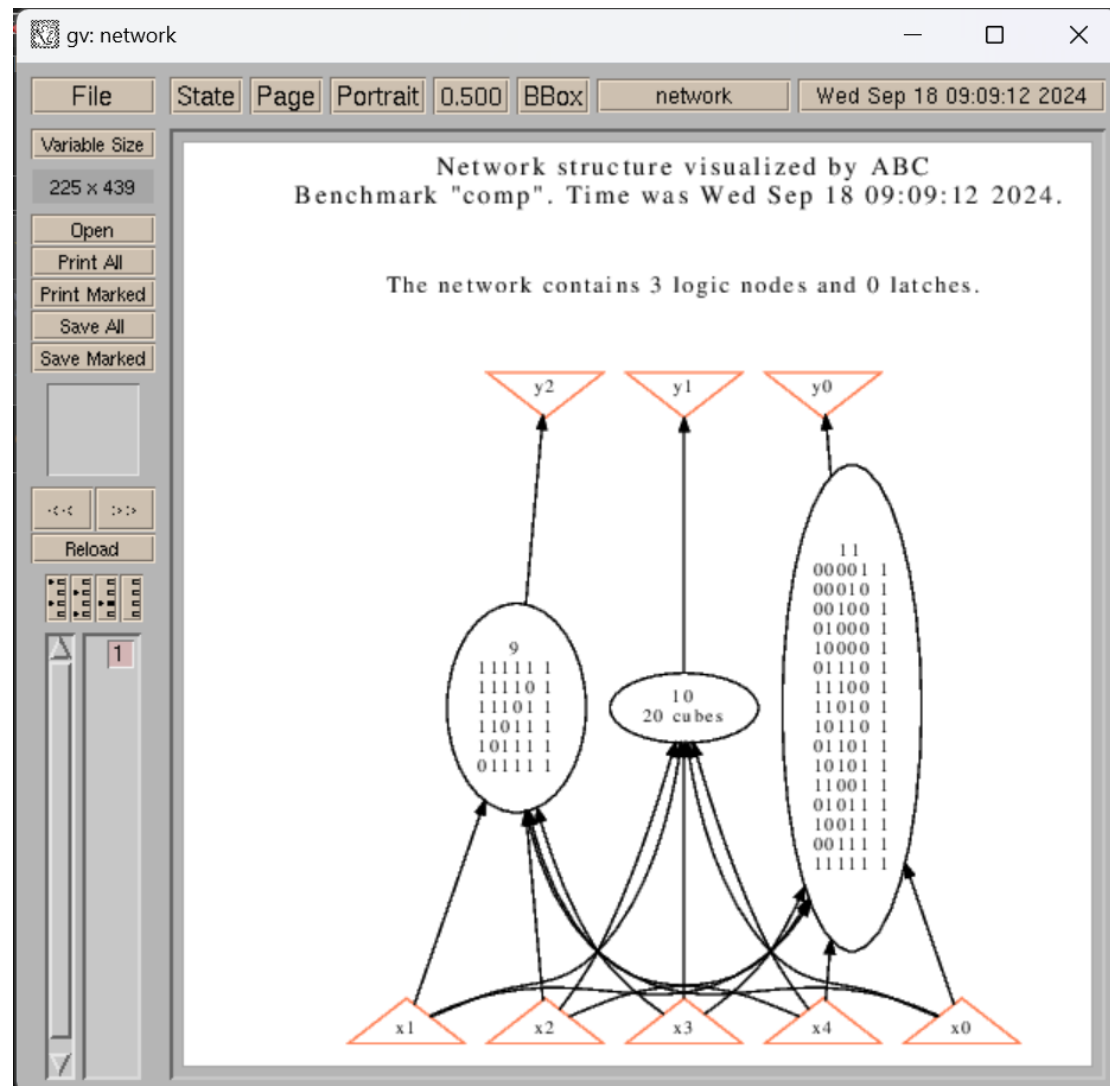
2 [Using ABC]
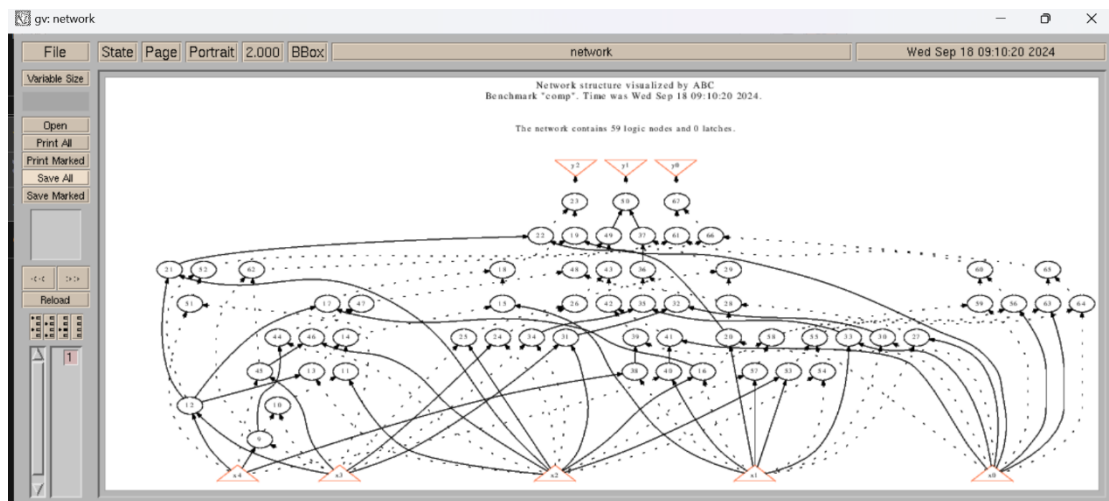
(b)
command:

```
abc 01> read blif/comp.blif
abc 02> print_stats
comp                          : i/o =    5/    3 lat =    0 nd =      3 edge =      15 cube =     42 lev = 1
abc 02> show
abc 02> Warning: Missing charsets in String to FontSet conversion
strash
abc 03> show
abc 03> Warning: Missing charsets in String to FontSet conversion
collapse
abc 04> show_bdd -g
abc 04> Warning: Missing charsets in String to FontSet conversion
```
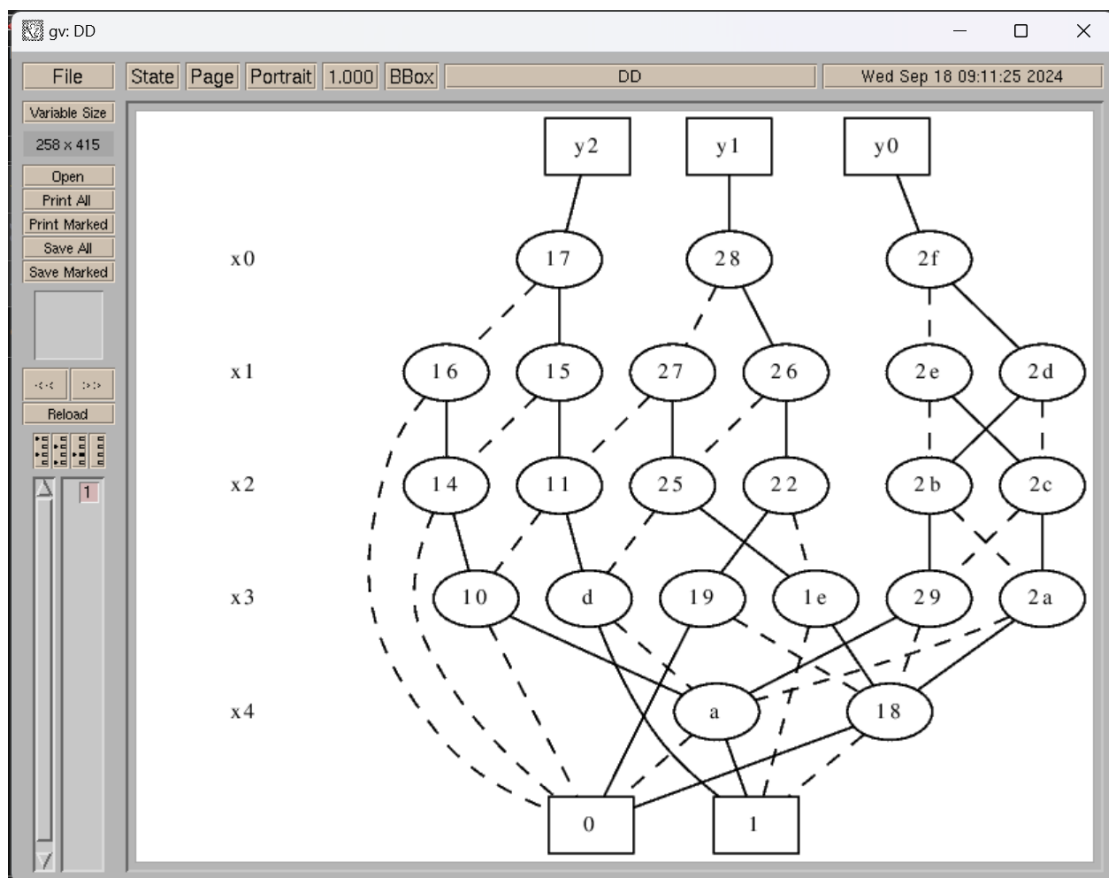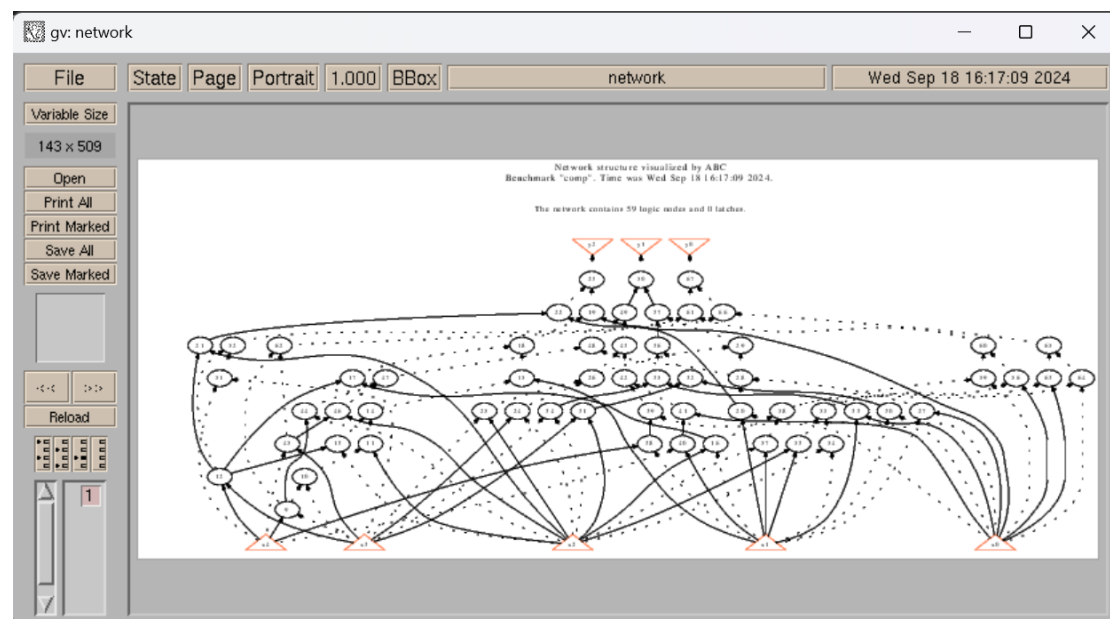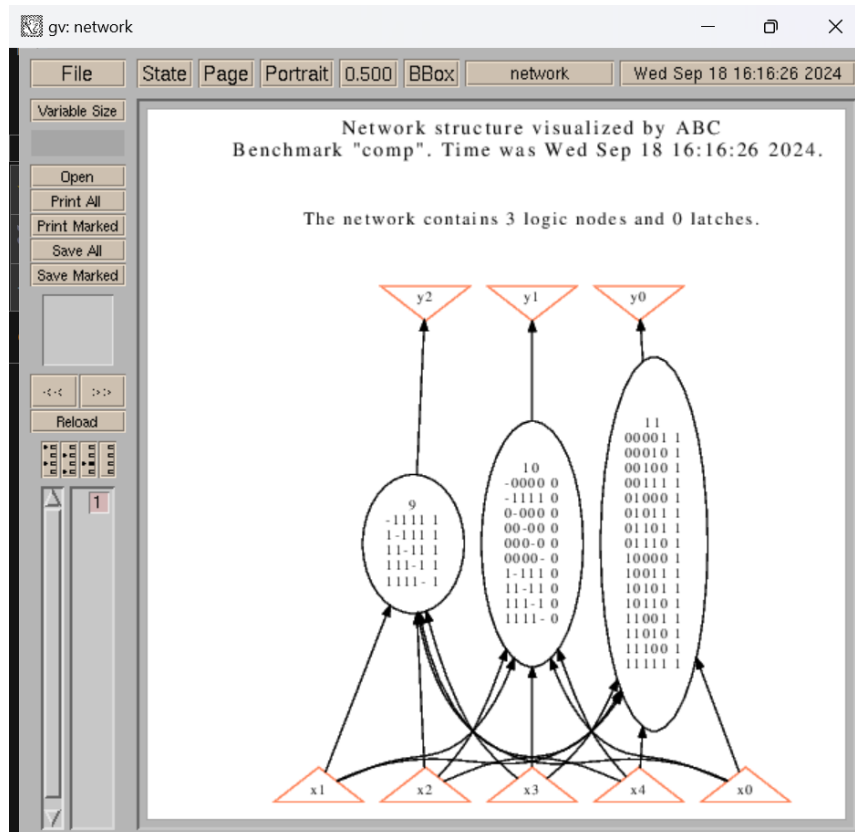
network structure:

AIG:

BDD:

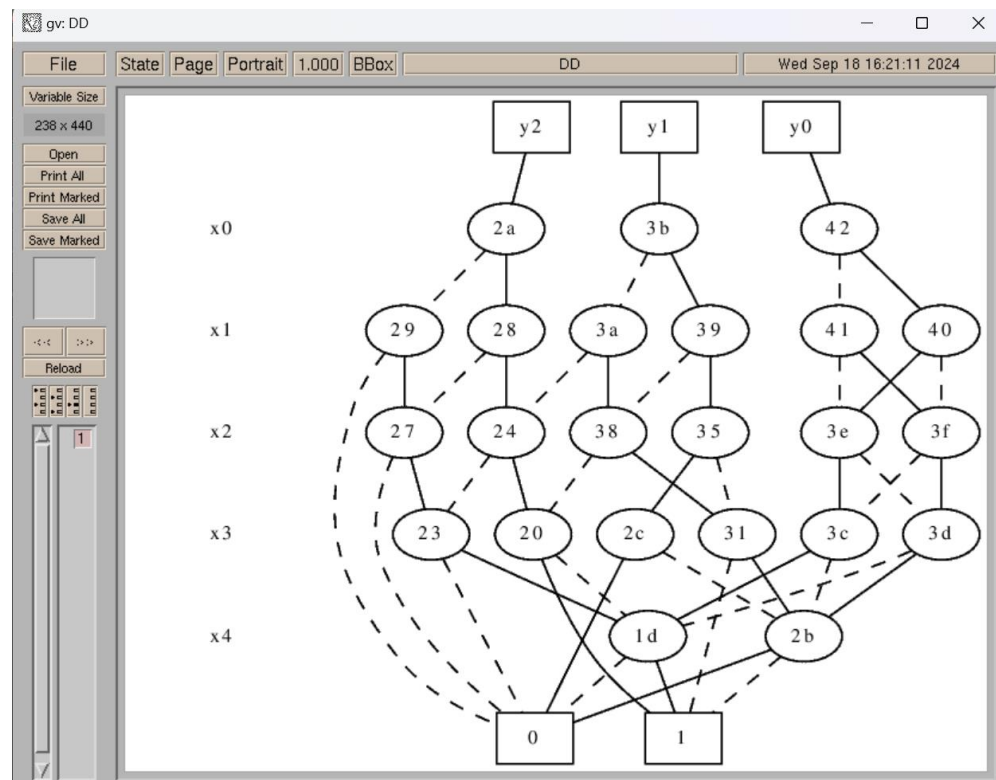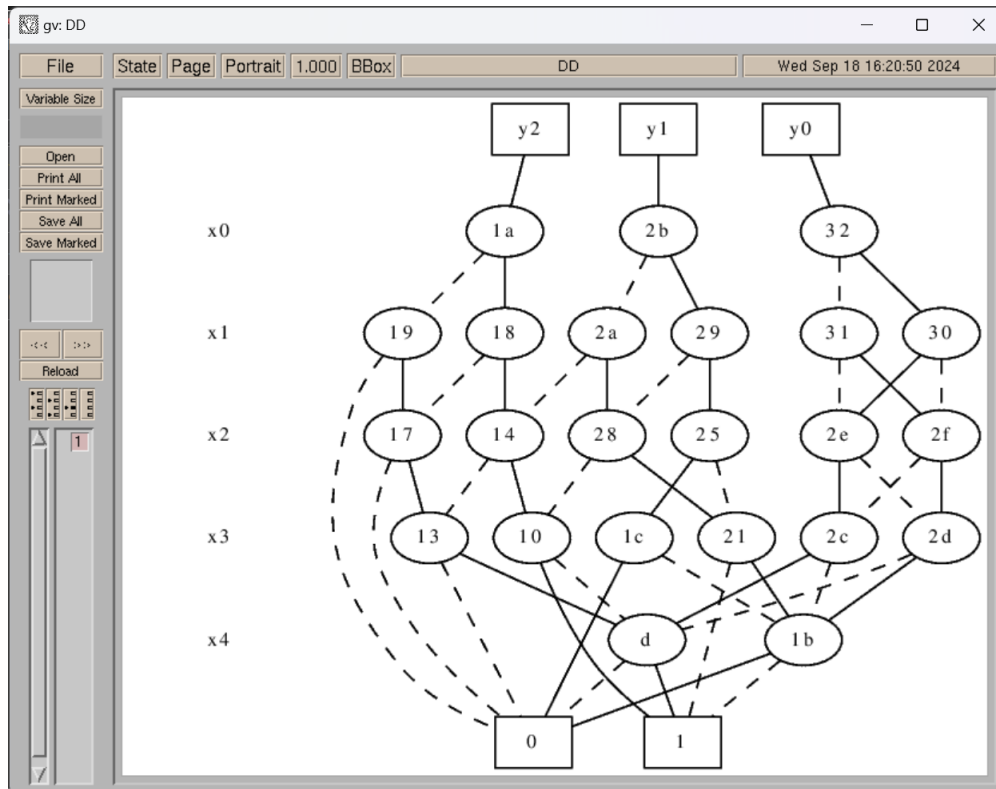# 3 [ABC Boolean Function Representations]

```
abc 01> read blif/comp.blif
abc 02> aig
abc 02> show
abc 02> Warning: Missing charsets in String to FontSet conversion
strash
abc 03> show
abc 03> Warning: Missing charsets in String to FontSet conversion
```


Network structure visualized by ABC
Benchmark "comp". Time was Wed Sep 18 16:16:26 2024.

The network contains 3 logic nodes and 0 latches.

```
abc 01> read blif/comp.blif
abc 02> bdd
abc 02> show_bdd -g
abc 02> Warning: Missing charsets in String to FontSet conversion
collapse
abc 03> show_bdd -g
abc 03> Warning: Missing charsets in String to FontSet conversion
```

(a)

The structure of **aig** is similar to blif, while **strash** optimizes the AIG by eliminating duplicated logic.

The structure of **bdd** and **collapse** is similar in this structure.

(b)

```
abc 19> read_blif blif/comp.blif
abc 20> strash
abc 21> collapse
abc 22> sop -d
abc 22> print_factor -s
n9 =   x1 x2 x3 x4 + x0 x2 x3 x4 + x0 x1 x3 x4 + x0 x1 x2 x4 + x0 x1 x2 x3
n10 =  !x1 !x2 x3 x4 + !x1 x2 !x3 x4 + !x1 x2 x3 !x4 + x1 !x2 !x3 x4 + x1 !x2 x3 !x4 + x1 x2 !x3 !x4 + !x0 !x2 x3 x4 + !x0 x2
!x3 x4 + !x0 x2 x3 !x4 + !x0 !x1 x3 x4 + x0 !x2 !x3 x4 + x0 !x2 x3 !x4 + x0 x2 !x3 !x4 + x0 x1 !x3 !x4
n11 =  !x0 !x1 !x2 !x3 x4 + !x0 !x1 !x2 x3 !x4 + !x0 !x1 x2 !x3 !x4 + !x0 !x1 x2 x3 x4 + !x0 x1 !x2 !x3 !x4 + !x0 x1 !x2 x3 x4
 + !x0 x1 x2 !x3 x4 + !x0 x1 x2 x3 !x4 + x0 !x1 !x2 !x3 !x4 + x0 !x1 !x2 x3 x4 + x0 !x1 x2 !x3 x4 + x0 !x1 x2 x3 !x4 + x0 x1 !
x2 !x3 x4 + x0 x1 !x2 x3 !x4 + x0 x1 x2 !x3 !x4 + x0 x1 x2 x3 x4
```

n9 denotes y2, n10 denotes y1, n11 denotes y0