(a)

1. logic network in AIG (by command `aig`) vs. structurally hashed AIG (by command `strash`) results:

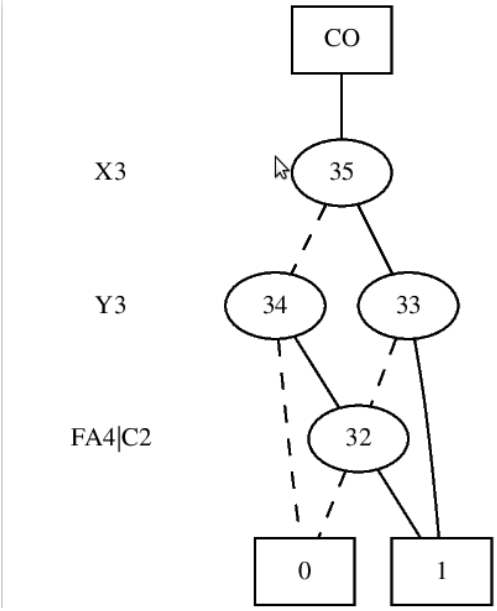
```
abc 03> read ./lsv/pa1/src/FA4.blif
Hierarchy reader flattened 4 instances of logic boxes and left 0 black boxes.
abc 04> aig;ps;strash;ps
FA4                        : i/o =    9/    5  lat =    0  nd =     8  edge =     24  aig  =    52  lev = 4
FA4                        : i/o =    9/    5  lat =    0  and =     44  lev = 13
```

After `strash`, number of and gate were reduced (52 → 44) and the logic network were extend to global AIG format, therefore the number of level increased(4→ 13)

2. logic network in BDD (by command `bdd`) vs. collapsed BDD (by command `collapse`) results:

```
abc 01> read ./lsv/pa1/src/FA4.blif
Hierarchy reader flattened 4 instances of logic boxes and left 0 black boxes.
abc 02> bdd;ps;collapse;ps
FA4                        : i/o =    9/    5  lat =    0  nd =     8  edge =     24  bdd  =    28  lev = 4
FA4                        : i/o =    9/    5  lat =    0  nd =     5  edge =     33  bdd  =    43  lev = 1
```

After `bdd`, only trasfrom nodes in logic network into bdd format with the inputs of gates as variable, ex:



After , the whole logic network was transformed into bdd format with primary inputs as variable and primary outputs as roots, and the logic network were flatten into one layer.

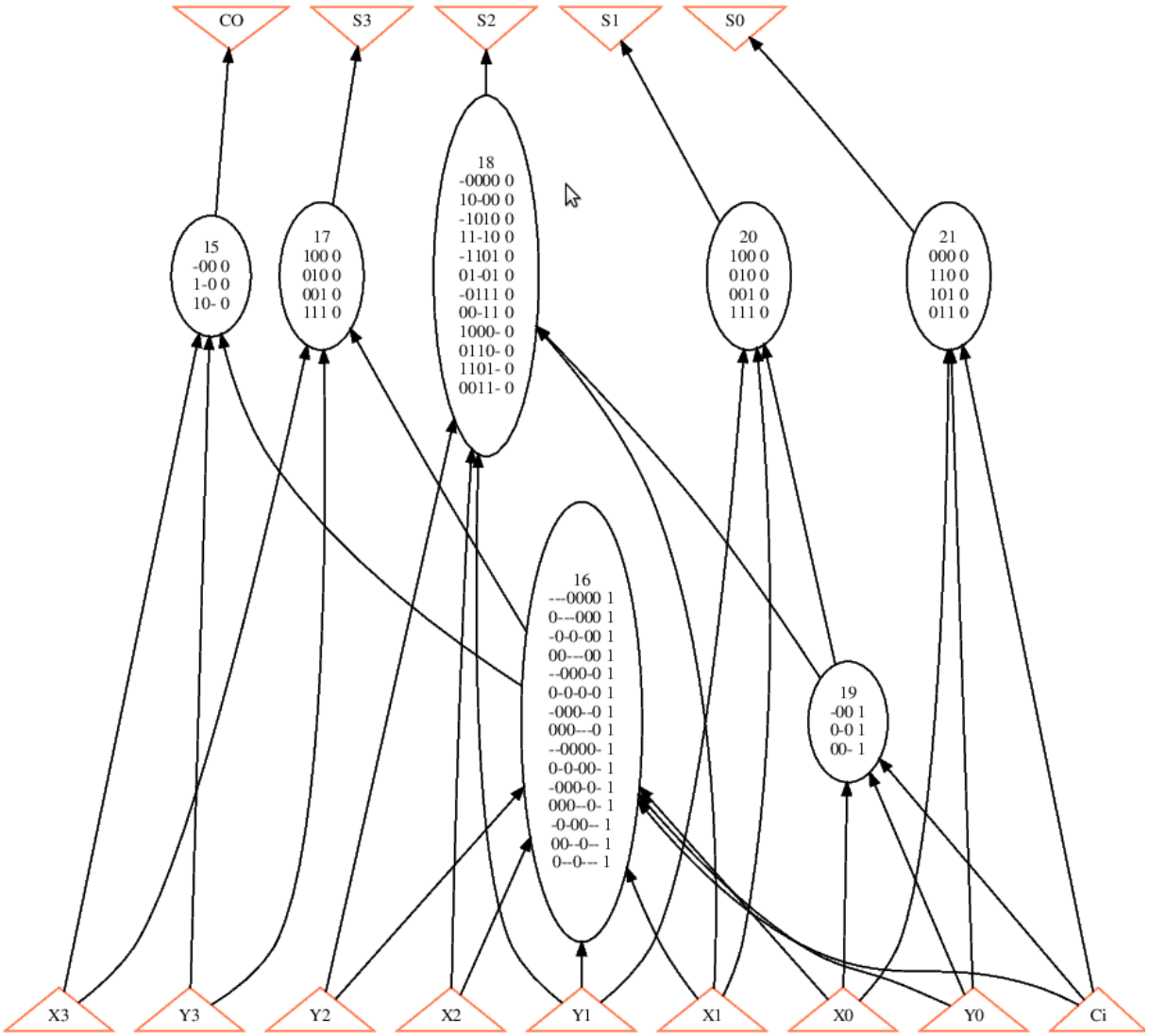
(b)

command: ren -s;

Use FA4.blif after `strash` as example, after command sequence above, we get logic network image below by command `show:`

Network structure visualized by ABC
Benchmark "FA4". Time was Thu Oct 15 10:12:33 2020.

The network contains 7 logic nodes and 0 latches.



result of `print_stats:`

```
(base) kyle@kyle-B450M-GAMING:~/Desktop/LSV-PA$ ./abc
UC Berkeley, ABC 1.01 (compiled Oct  7 2020 20:34:12)
abc 01> read ./lsv/pa1/FA4.blif
Hierarchy reader flattened 4 instances of logic boxes and left 0 black boxes.
abc 02> strash
abc 03> renode -s
abc 04> ps
FA4                       : i/o =    9/    5  lat =    0  nd =     7  edge =     27  cube =    45  lev = 2
abc 04>
```