

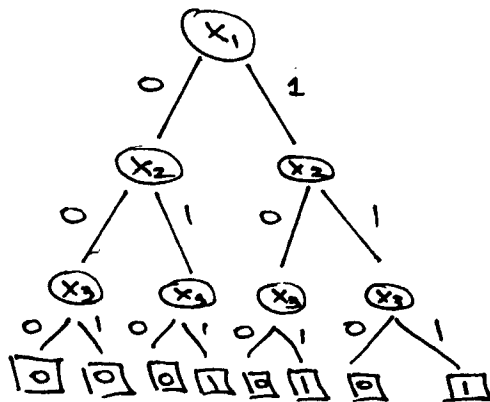
Ordered Binary Decision Diagrams:

- A representation of Boolean Functions
- Directed acyclic graph :
 - 1) Internal vertices \leftrightarrow Variable
 - 2) Terminal nodes \leftrightarrow Function values

Example :

$F(x_1, x_2, x_3)$			
x_1	x_2	x_3	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

BDD in order x_1, x_2, x_3

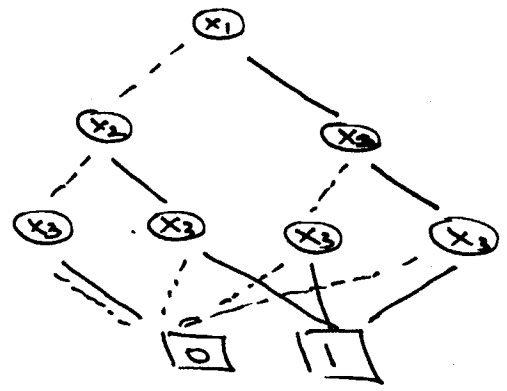


2^n terminal nodes

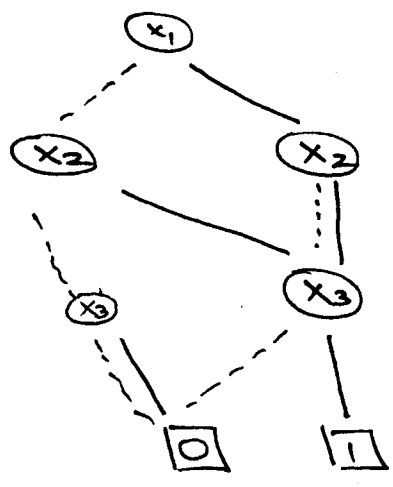
$$2^n + 2^{n-1} + 2^{n-2} + \dots + 1 = \frac{2^{n+1} - 1}{2 - 1} = 2^{n+1} - 1$$

Reduced BDD :

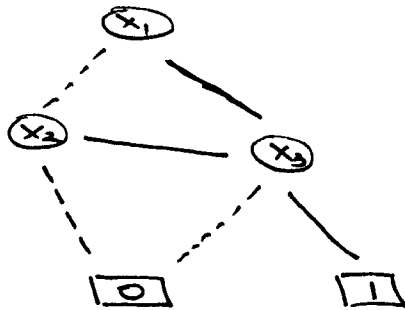
- ① Merge terminal nodes with same value:



- ② Remove duplicate non-terminal nodes:



- ③ Remove redundant tests:



Iterate if necessary!

$$P = x_1 x_3 + x_1' x_2 x_3$$

Reduced BDD could be a concise representation but not necessarily!
ORDERING maybe very important!