

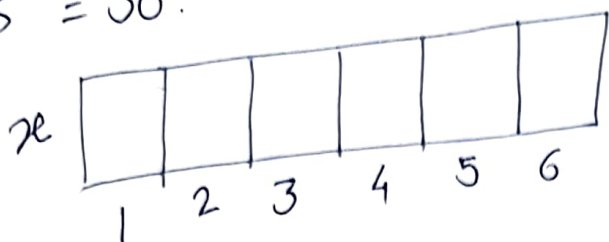
①

Sum of subsets

$$w[1:6] = \{ \overset{1}{5}, \overset{2}{10}, \overset{3}{12}, \overset{4}{13}, \overset{5}{15}, \overset{6}{18} \}$$

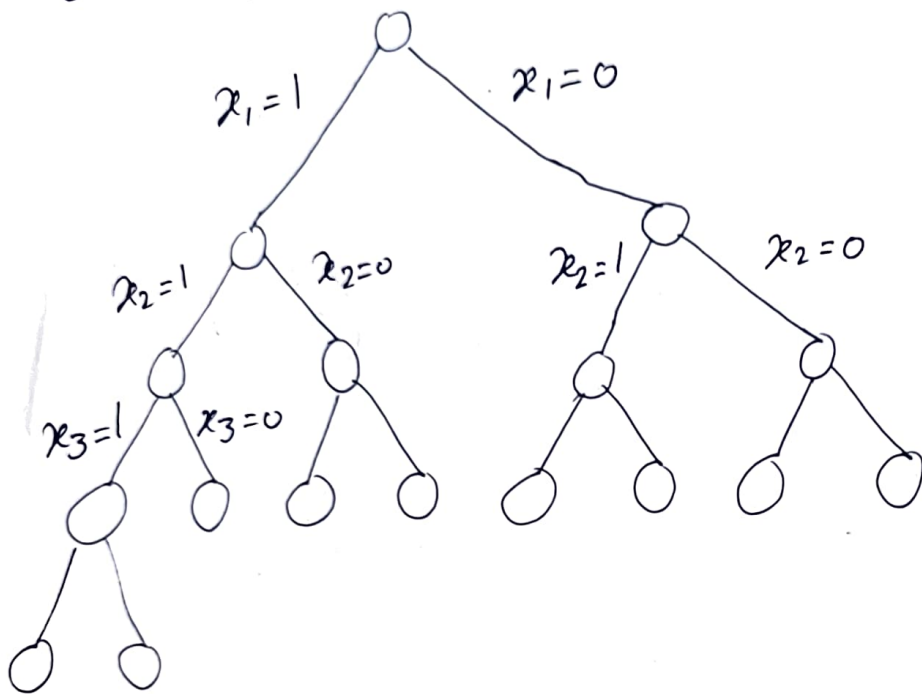
$$n = 6 \quad m = 30$$

Find the weights in such a way that sum of subsets = 30.



$$x_i = 0/1$$

State space tree



$$x_i = 1$$

$$2^6 = 2^n$$

It is exponential \rightarrow time consuming
Using backtracking \rightarrow bounding funⁿ \rightarrow kills the fun^k

BF1

Back tracking

$$\sum_{i=1}^k w_i x_i + w_{k+1} \leq m$$

Total of all nodes

0, 73

 $x_1 = 1$

5, 68

 $x_2 = 1$

15, 58

 $x_3 = 1$

27, 46

 $x_3 = 0$ $x_4 = 1$ ~~40, 33~~ $x_4 = 0$

27, 33

 $x_4 = 1$

28, 33

 $x_4 = 0$

15, 33

 $x_5 = 1$ ~~43, 18~~ $x_5 = 0$

27, 18

 $x_5 = 1$ ~~43, 18~~ $x_5 = 0$

28, 18

 $x_5 = 1$ 30, 18SolⁿKill this node using bounding funⁿ

kill BF1

 $x_6 = 1$ ~~45, 0~~

kill BF1

 $x_6 = 0$ ~~27, 0~~

BF2

 $x_6 = 1$ ~~46, 0~~ $x_6 = 0$ ~~28, 0~~

$$BF1 = \sum_{i=1}^K w_i x_i + w_{k+1} \leq m$$

Total wt

wt of next obj

$$BF2 \quad \sum_{i=1}^K w_i x_i + \sum_{i=k+1}^h w_i > m$$

Total wt

remaining wt

Solⁿ

	1	2	3	4	5	6
	1	1	0	0	1	0