

# Backtracking

\* Subset Generation

$n=3$  a, b, c

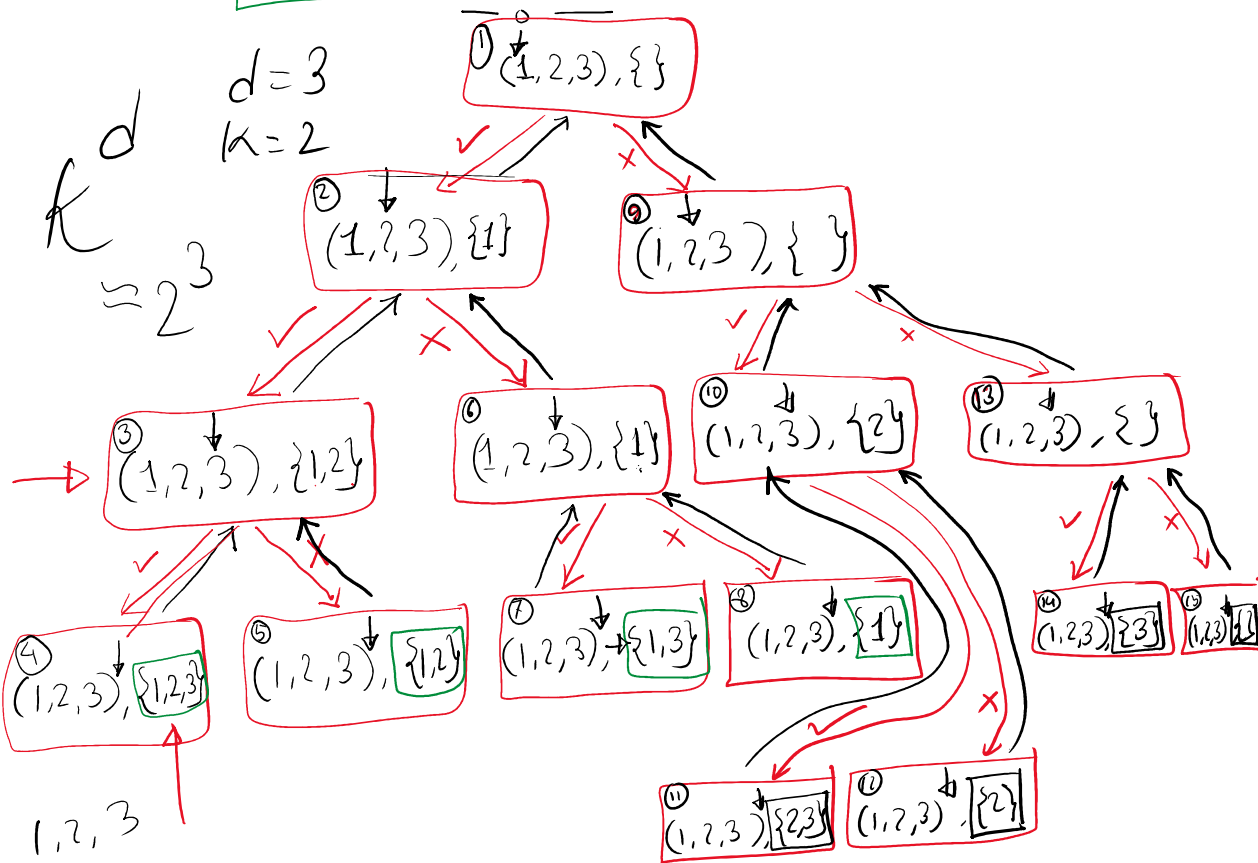
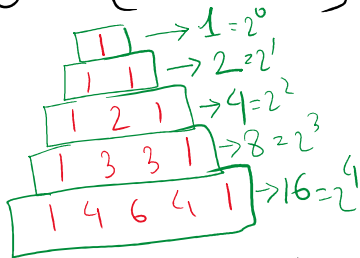
$\{\}$	$\{a, b, c\}$
$\{a\}$	$\{a, c\}$
$\{b\}$	$\{b, c\}$
$\{c\}$	$\{a, b, c\}$

$S = \{a, b, c\}$

$$\binom{3}{0} + \binom{3}{1} + \binom{3}{2} + \binom{3}{3} = 2^3$$

$$1 + 3 + 3 + 1$$

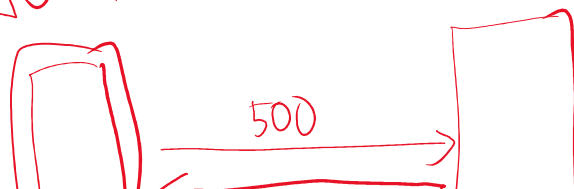
$$\binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \dots + \binom{n}{n} = 2^n$$



$1, 2, 3$   
 $1, 2$   
 $1, 3$   
 $2, 3$   
 $2$   
 $3$   
 $\phi$

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Left

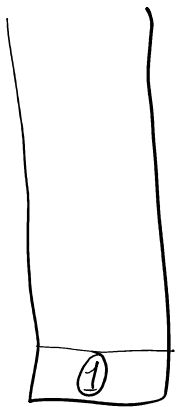
void **gen**(vec)

if (pos == a  
print  
return

subset.pos

**gen**(arr

{1,2,3}

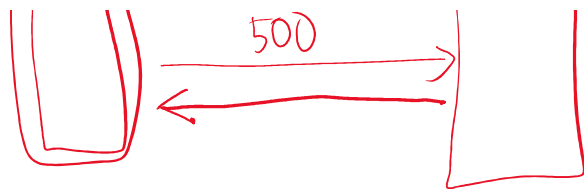


```
for<int> a in arr, ...  
vector<int> subset,  
pos  
arr.size()) {  
    (subset);  
    n;
```

```
h.back(arr[pos])  
, subset, pos+1);  
- n - 1 - 1 -
```



7



left {  $\rightarrow$  gen (arr)  
 $\rightarrow$  subset.

right { gen (arr)

1, 2, 3

1, 2, 3

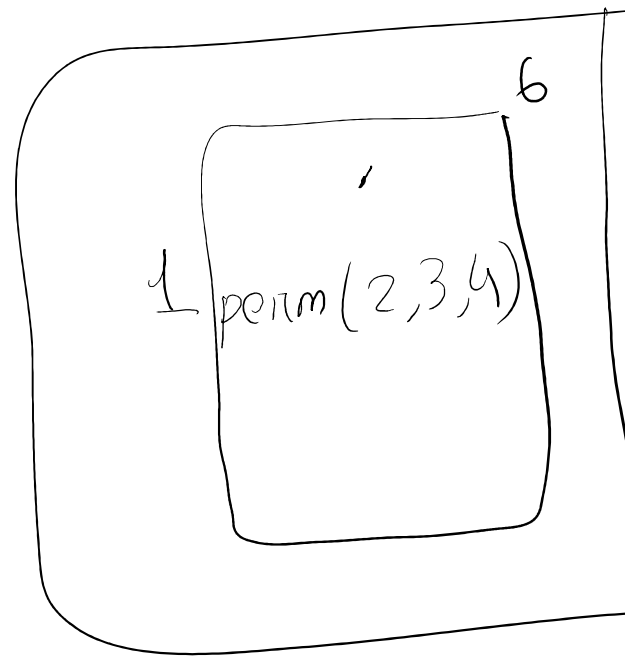
1, 3, 2

2, 1, 3

2, 3, 1

3, 1, 2

3, 2, 1



DFS

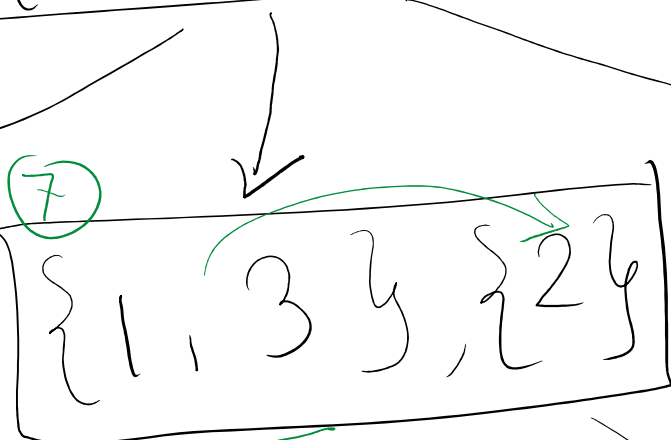
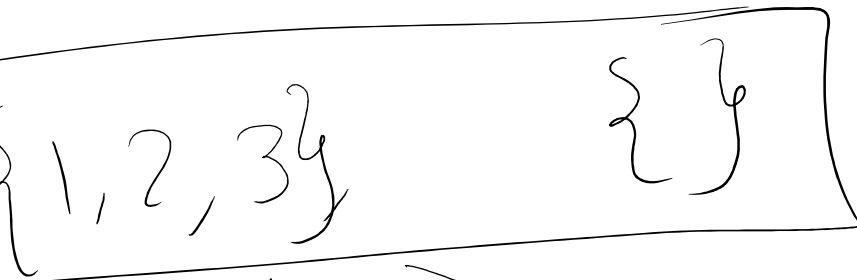
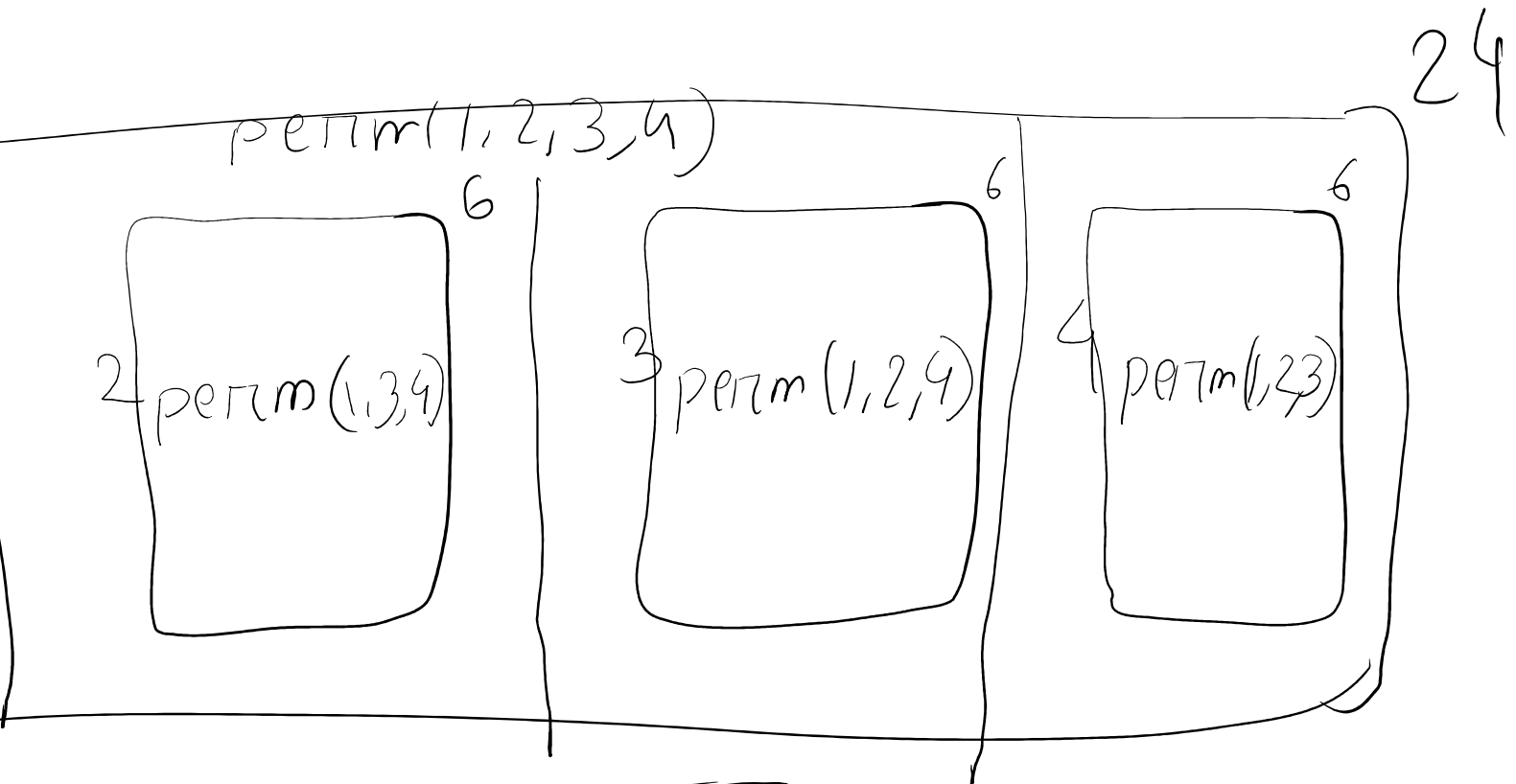
①

② {2, 3}, {1}

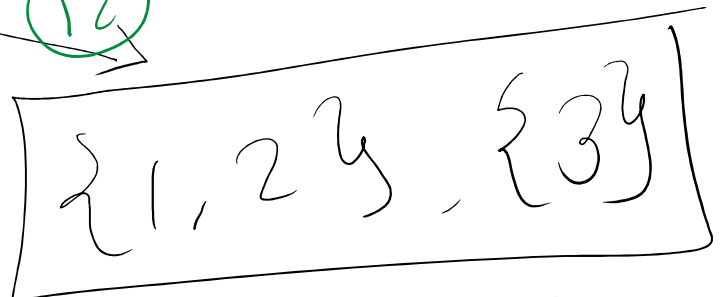
, subset, pos+1)

pop-back()

, subset, pos+1);



(12)



15

