Codeforces

flowers

Monster $\xrightarrow{\text{can eat}}$ red flowers

Monster

Marmot $\xrightarrow[\text{eat}]{\text{can}}$ white flowers (only k – at a time)

n-flowers

$\boxed{k} \rightarrow \boxed{2}$

$\boxed{n}$

white   red

$k=2$

1

$k-2$

$n-1$
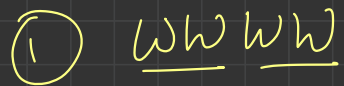
Marmot has two choices

① eat a red flower $\Rightarrow$ $n-1$ flowers remain

② eat k - white flowers

↳ $n-k$ flowers

$$\frac{n = 4}{k = 2}$$

how many flowers Marmot can eat

④

white ②

red ①

2

white ②

red

① 1

white ②

white ②

red ①

① 0 ①

red ①

white ②

① 1

red ①

0 ③

0 ④

① 1

red ①

0 ⑤

① WWWW
② WW RR
③ R WW R
④ R R WW
⑤ RRRR
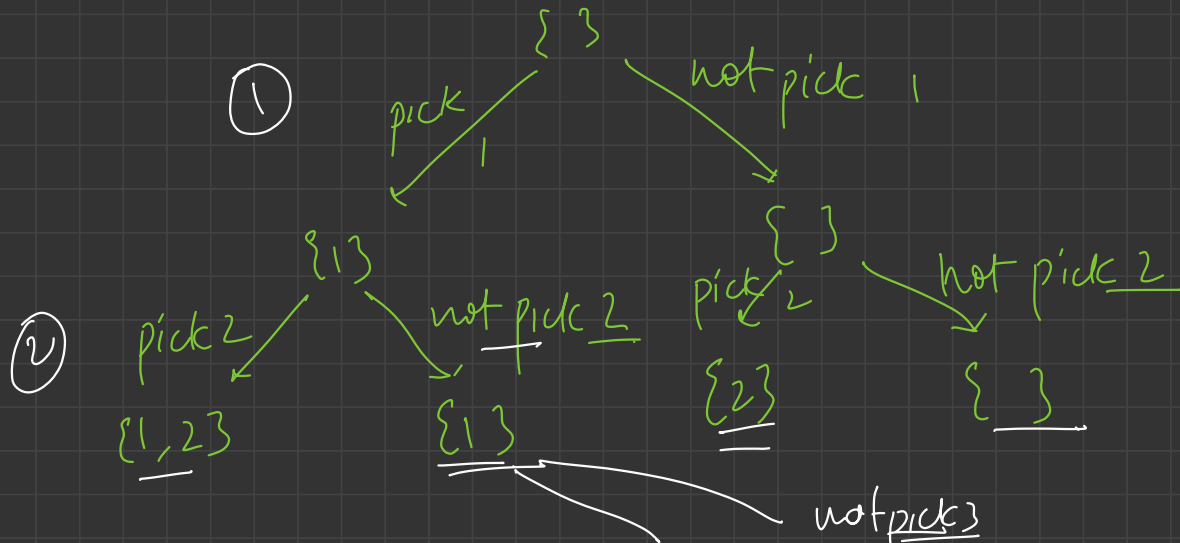
① Subsequences

② Permutation

Subsequence : array
↳ delete some value

arr → 1 2̶ 3 4̶ 5̶

13
125

① pick _i-th_ element as the part of
current subsequence

② do not pick i-th element as part of
current subsequence

{ 1, 2, 3 }

① { }

pick 1   not pick 1

{1}   { }

② pick 2   not pick 2   pick 2   not pick 2

{1,2}   {1}   {2}   { }

notpick3

pick3 {1, 2, 3}

not pick 3 {1, 2}

pick 3 {1, 3}   {1}

Permutation

{1, 2, 3}

- 1 2 3 ✓
- 1 3 2
- 2 1 3 ✓
- 2 3 1
- 3 1 2 ✓
- 3 2 1

a b c

a → a b c
  b → abc
    c → abc
  c → acb
    b → acb

b → b a c
  a → bac
    c → bac
  c → bca
    a → bca

c → c b a
  b → cba
    a → cba
  a → cab
    b → cab

Smart Keypad

$0 \rightarrow$ `` ' ``

$1 \rightarrow$. + @ $

$2 \rightarrow$ a b c

$3 \rightarrow$ def

$4 \rightarrow$ ghi

.

!

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a → a3, b → b3, c → c3

a3: d → ad, e → ae, f → af

b3: d → bd, e → be, f → bf

c3: d → cd, e → ce, f → cf

```
void printCombinations(string &s, string &output, int i){
    //base case...                    ②
    if(i == s.length()){
        cout<<output<<endl;
        return;
    }

    //work
    int digit = s[i] - '0';    → 2
    for (int j = 0; j < table[digit].size(); ++j){
        char x = table[digit][j];    ← a
        //recursive case
        output.push_back(x);
        printCombinations(s, output, i+1);
        output.pop_back();
    }
}
```

i = 0

S = "23"

output -

b

i = 1

i = 2

i = 0

"a b c"

x

"d e f"   ← table [3]

x

table [2]

print & return

a d ✓
a e ✓
a f ✓

b d
b e
b f

c d
c e
c f

c → pop

⑤

all possibilities

Q Given input a string S,
and two characters C and D.
Replace all occurrence of C with D.