n=100 start!

n=3

n=2

n=1

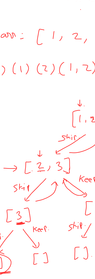
---

arr = [1, 2, 3].

() (1) (2) (3) (1,2) (1,3) (2,3) (1,2,3).

arr = [1, 2, 2].

() (1) (2) (1,2) (2,2) (1,2,2)




curr: [~~1, 2, 3~~]

res: [[].
[3]
[2]
[2,3].

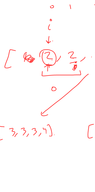
Get subsets (arr, i)

skip → Get subsets (arr, i+1)

keep → curr. push back(arr[i])
Get subsets (arr, i+1).
curr. pop-back()

[1, 2, 2]

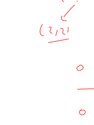
S K S → [2]
S S K → [2]




(*) (1) (1) (2,2)

~~(*)~~ () (1) (2,2)

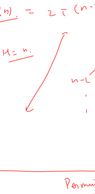
() (1) (3,3) (3,3,3)




$T(n) = T(n-1) + T(n-1) + c$

$T(n) = 2T(n-1) + c$

H: n.




$T(n) = O(2^n)$

---

Permutations.

[1,2,3].

(1,2,3)
(1,3,2)
(2,1,3)
(2,3,1)
(3,1,2)
(3,2,1)

n n-1 n-2 ... 1

$n * (n-1) * (n-2) \dots * (1)$

$= n!$

(i, arr)

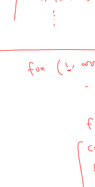
swap(i,i) → (i+1, arr).

swap(i,i+1) → (i+1, arr).

swap(i, i+2)

(i+1, arr)
⋮

[2, 1, 3].
[1, 2, 3]
[3, 2, 1]




TODO

---

fun (i, arr) {

fun (i+1, arr). // skip

curr. pb (arr[i]).
fun (i+1, arr)
curr. pop-back()

// keep

}

[1,2,3]

0 0 0 → []
0 0 1 → [3]
0 1 0 → [2]
0 1 1 → [2, 3]
1 0 0 → [1]
1 0 1 → [1, 3]
1 1 0 → [1, 2]
1 1 1 → [1, 2, 3].

n = 3.

2

$O(n * 2^n)$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 3 | 8 | 4 | 5 | 7 | 8 | 4 | 0 | 0 |
| 1 | 5 | 2 | 9 | 9 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 8 | 7 | 0 | 0 | 0 | 0 | 3 | 1 |
| 3 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 8 | 0 |
| 4 | 9 | 0 | 0 | 8 | 8 | 3 | 0 | 0 | 5 |
| 5 | 0 | 5 | 0 | 0 | 9 | 0 | 6 | 0 | 0 |
| 6 | 1 | 3 | 0 | 0 | 0 | 0 | 2 | 5 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 4 |
| 8 | 0 | 0 | 5 | 2 | 8 | 6 | 3 | 0 | 9 |

i = 4.
j = 5.

(i == 8 && j == 9)

row_start = i - i%3.
col_start = j - j%3.