

1 2 3 3 4 5

$$S1 = 1+2+4$$

$$S2 = 3+3+5$$

T	T	F	F	T	F
---	---	---	---	---	---

↳ T: G1

F
↳ G2

T	F	F	T	F	T
---	---	---	---	---	---

$$S1 = 1+3+5$$

$$S2 = 2+3+4$$

1 3 5 and 2 3 4

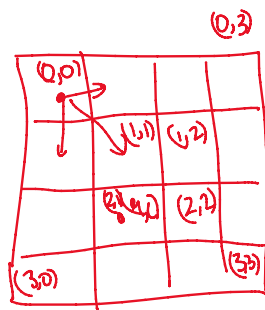
G1S G2S
18 != 0

10

idx == arr.length

include → G1

exclude → G2



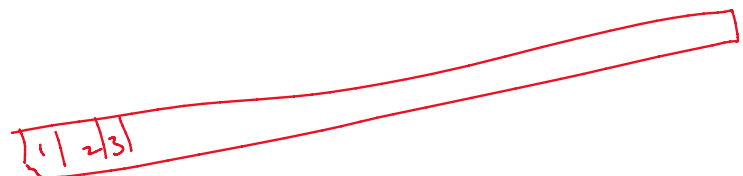
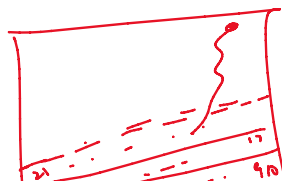
→ Diagonal

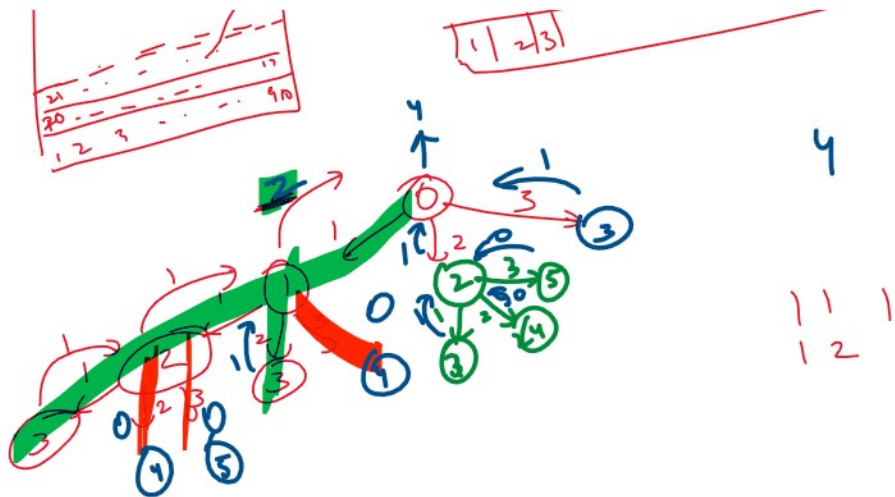
N, N

↳ $n = c$ ✓

↳ $n + c = n - 1$

4 → 1, 2, 3, 4





DNF \rightarrow Dutch National Flag / Sort in linear time

$[0, 1, 2, 0, 2, 1, 1, 0]$

- 1) Bubble Sort / Selection / Insertion $\checkmark \rightarrow O(N^2), O(1)$
- 2) Merge Sort / Quick $\rightarrow O(N \log N), O(N) / O(\log N)$
- 3) Arrays.sort \checkmark Not selected

4)

c_0, c_1, c_2
||| ||| ||

```
for ( ) {
    arr[i] == 0
    c0++
    == 1
    c1++
    == 2
    c2++
}
```

$[0, 1, 2, 0, 2, 1, 1, 0]$

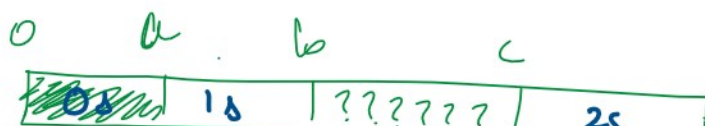
```
for ( ) {
    if (c0 > 0)
        arr[i] = 0
    else if (c1 > 0)
        arr[i] = 1
    else if (c2 > 0)
        arr[i] = 2
    else
        break
}
```

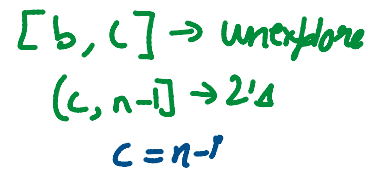
$[0, 1, 2, 0, 2, 1, 1, 0]$

$[0, a) \rightarrow 0's$

$[a, b) \rightarrow 1's$

$[b, c] \rightarrow \text{unknown}$





✓ Start : $a=0$
 $b=0$

13222 2 2 22???

$$C \rightarrow A-1 \rightarrow 215$$

$\begin{matrix} a \\ \downarrow \\ \downarrow b \end{matrix}$
 $[0, 0, 0, 0, 1, 0, 1, 1, -]$

$a_{1111}, \dots, \overset{b}{\underset{c}{\underbrace{20}_{\rightarrow 0}}}, 0, 2, 1, \dots, \overset{c}{\underbrace{2}_{\swarrow}}, 2, 2, 2, 2, 2$

 $[4, 7)$
$$[1, 3)$$
 $[1, 2]$

$[0, 1, 1, 0, 1, 1, 2, 0, 2, 2]$ ✓

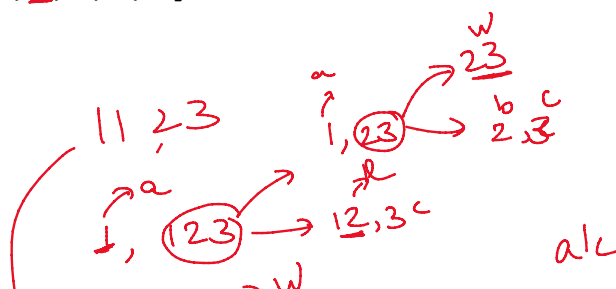
[0, 0, 1, 1, 1, 1, 2, 0, 2, 2] ✓

[0, 0, 1, 1, 1, 1, 2, 0, 2, 2] ✓

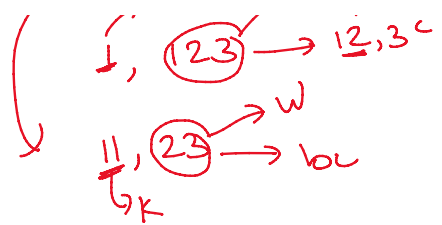
[0, 0, 1, 1, 1, 1, 2, 0, 2, 2] ✓

[0, 0, 1, 1, 1, 1, 0, 2, 2, 2] ✓

[0, 0, 0, 1, 1, 1, 1, 2, 2, 2] ✓


$$\left. \begin{array}{c} 1 \\ 2 \\ 3 \\ 4 \\ \vdots \\ 26 \end{array} \right\}$$

aaW
aaWc



alc

26

kw
Kbc

I