

Next Permutation

arr[] = [2 1 5 4 3 0 0]

raj
rax
rbx

In english
dictionary
Next word tend
to have longer
prefix match

① Longer prefix match

2 1 5 4 3 0 0

2 5

2 4

(2 3)

After 1 we need someone
right after/Just greater than 2

small ← 2 0

Initially,

2 1 5 4 3 0 0

No one
GT than 0

2 1 5 4 3 0 0

No one GT than 3

2 1 5 4 3 0 0

No one GT than 4

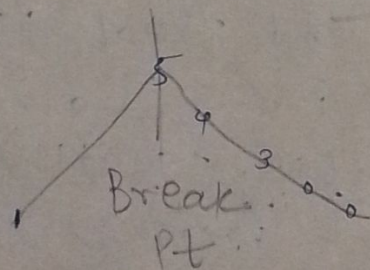
2 1 5 4 3 0 0

No one GT than 5

2 1 5 4 3 0 0

there are
el GT than 5

Break pt.



step ① find Break pt.

$a[i] < a[i+1]$

$$[2 \ 1 \mid 5 \ 4 \ 3 \ 0 \ 0]$$

2 5
2 4
2 3
2 0

Step (ii) find element which is JUST Greater than

$a[i]$ (Break Pt.) so that you get el just GT or just after given permuⁿ and swap it with $a[i]$

$$2 \ 3 \mid 5 \ 4 \ 1 \ 0 \ 0$$

Dec order

Step (iii) - Try to keep this part as small as possible (in inc order)

$5 \ 4 \ 1 \ 0 \ 0 \rightarrow 0 \ 0 \ 1 \ 4 \ 5$
Simply reverse it

Edge case 5

$[5 \ 4 \ 3 \ 2 \ 1]$

↓ next permuⁿ

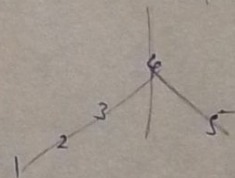
$[1 \ 2 \ 3 \ 4 \ 5]$

so simply reverse when

$i = -1$

$5 \ 4 \ 3 \ 2 \ 1$
NO Break Pt.

$$[1 \ 2 \ 3 \ 4 \mid 5]$$



At max we can get break Pt. at $n-2$

so to find Break Pt

```
for (i = n-2; i >= 0; i--)
{
    if (a[i] < a[i+1])
    {
        ind = i;
        break;
    }
}
```

if (ind == -1) reverse(a);