

Anand
Reddy

Overview

Two pointing

[

[

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Variable

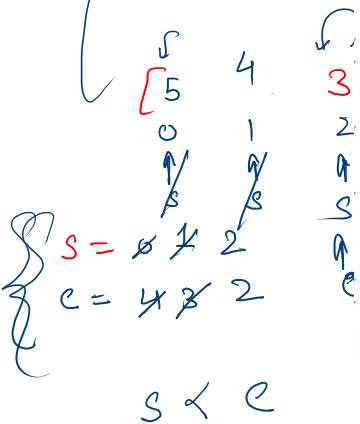
```
import java.io.*;
import java.util.*;

public class Solution {
```

```
    public static void main(String[] args) {
        int a = 5;
        int[] b = {5};
        System.out.println(a + " " + b[0]);
        change(a);
        changeTwo(b);
        System.out.println(a + " " + b[0]);
    }

    public static void change(int a) {
        a ++;
    }

    public static void changeTwo(int[] b) {
        b[0] ++;
    }
}
```



```

public class Solution {

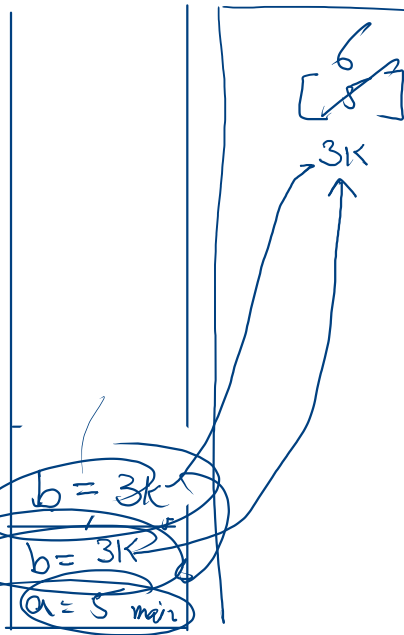
    public static void main(String[] args) {
        int a = 5;
        int[] b = {5};
        System.out.println(a + " " + b[0]);
        change(a);
        changeTwo(b);
        System.out.println(a + " " + b[0]);
    }

    public static void change(int a) {
        a ++;
    }

    public static void changeTwo(int[] b) {
        b[0] ++;
    }
}

```

main.change.a
main.a



(37)

11

Handwritten diagram illustrating a mapping from a set of indices to a set of values. The indices are 1 through 9, and the values are 10, 20, 30, 40, 50, 100, 200, 300, 400, 500. The mapping is defined by a function f .

The values are grouped into three sets:

- Set 1: {10, 20, 30}
- Set 2: {100, 200}
- Set 3: {300, 400, 500}

The function f is defined as:

- $f(1) = 10$
- $f(2) = 20$
- $f(3) = 30$
- $f(4) = 40$
- $f(5) = 50$
- $f(6) = 100$
- $f(7) = 200$
- $f(8) = 300$
- $f(9) = 400$
- $f(10) = 500$

The diagram also shows a mapping from the set of values to a set of indices {1, 2, 3, 4, 5, 6, 7, 8, 9}.

```

public static int[] interleaving(int[] arr) {
    int n = arr.length, f = 0, s = n / 2, idx = 0;
    → int[] ans = new int[n];
    while(idx < n) {
        ans[idx++] = arr[f++];
        ans[idx++] = arr[s++];
    }
    return ans;
}

```

1

10

0 1 2 3 4 5 6 7 8 9
 [1, 2, 3, 4, 5, 10, 20, 30, 40, 50]

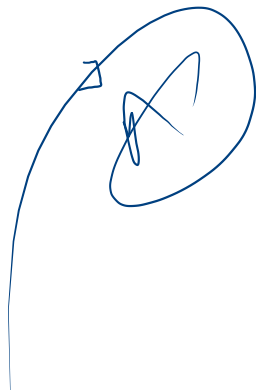
$\frac{1}{f}$ $\frac{1}{s}$ f s \rightarrow
 [1 10] 2 20
 \uparrow \uparrow
 = - - -

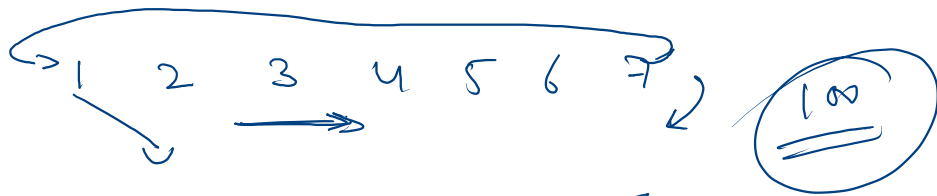
$n = 10$

$f = 0 \neq 2$

$s = 5 \neq 7$

$idx = 0 \neq 2 \neq 4$





7 1 2 3 4 5 6

6 7 1 2 3 4 5

5 6 7 1 2 3 4

2

$\rightarrow K=0$	1	2	3	4	5 =
$\rightarrow K=1$	5	1	2	3	4 =
$\rightarrow K=2$	4	5	1	2	3 =
$\rightarrow K=3$	3	4	5	1	2 =
$\rightarrow K=4$	2	3	4	5	1 =

$\rightarrow K=5$	1	2	3	4	5 =
$\rightarrow K=6$	5	1	2	3	4 =
$K=7$	4	5	1	2	3 =
$K=8$	3	4	5	1	2 =
$K=9$	2	3	4	5	1 =
$K=10$	1	2	3	4	5 =

~~$\rightarrow 1$~~

$8 = 3$

$K=2$

$K \rightarrow 0 \text{ to } n-1$

$\%$

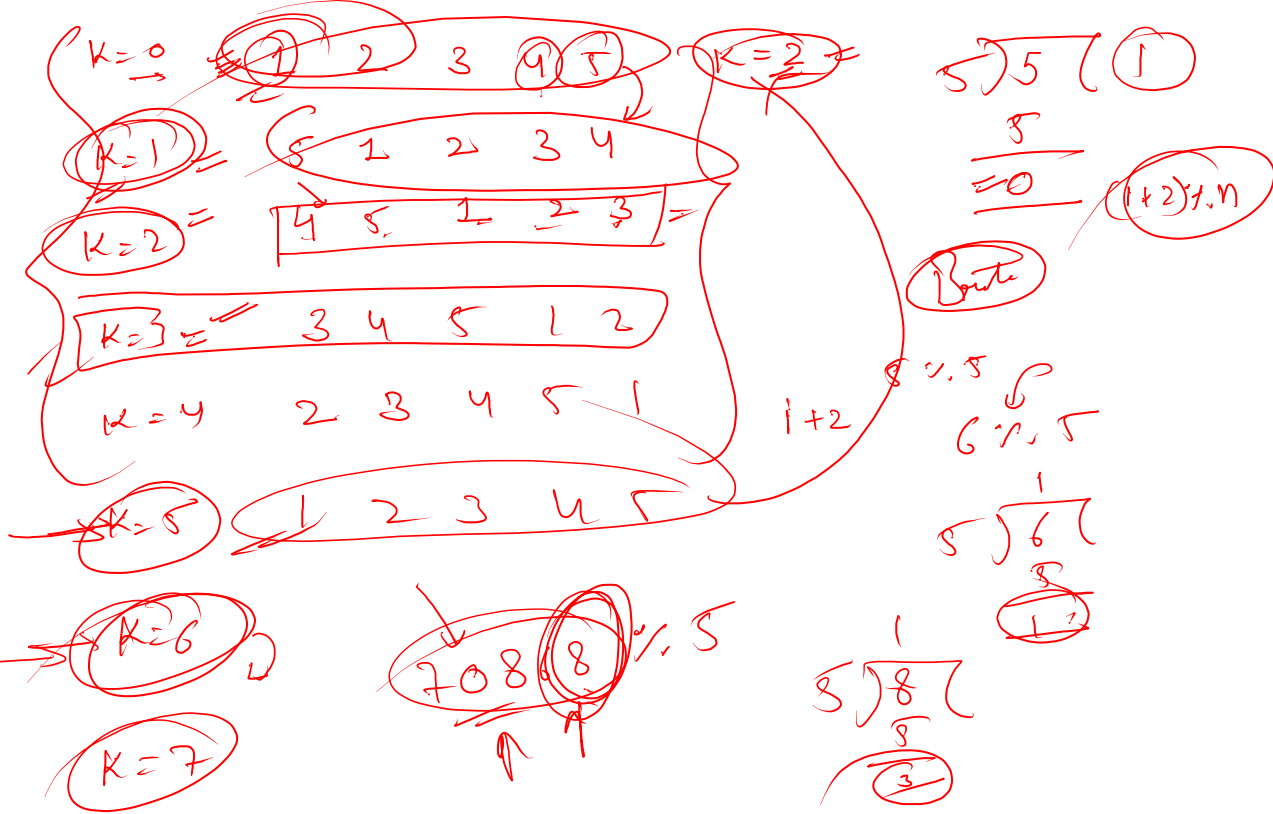
$n \% K$

$6 \approx 1.5$

$100888 \div 5$

$8 \div 1.5$

3



$$[1^0 \ 2^1 \ 3^2 \ 4^3 \ 5^4] \quad K=2 =$$

$$\textcircled{3+2} = \textcircled{5} \checkmark, 5$$

$$= \begin{bmatrix} 4 & 5 & 1 & 2 & 3 \\ 0 & 1 & 2 & 3 & 4 \end{bmatrix} =$$

$$G(n)$$

✓✓

$$(4+2) \sim 5$$

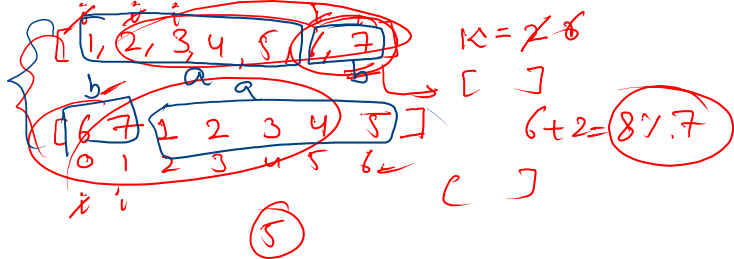
$$\textcircled{G \sim 5}$$

$$= 1$$

```

public static int[] rotate(int[] arr, int k) {
    int n = arr.length;
    int[] ans = new int[n];
    → for(int i = 0; i < n; i++) {
        int idx = (i + k) % n;
        ans[idx] = arr[i];
    }
    return ans;
}

```



$$O(n-1) \approx O(n)$$

$$i = 0$$

$$idx = 2 \quad (1+2) \% 7 = 3$$

$$2 \% 7$$

$$6 - 7 = -1$$

$$\begin{array}{r} 0 \\ 7 \overline{) 2} \\ 0 \\ \hline 2 \end{array}$$

$$(5+2) \% 7 = 0$$

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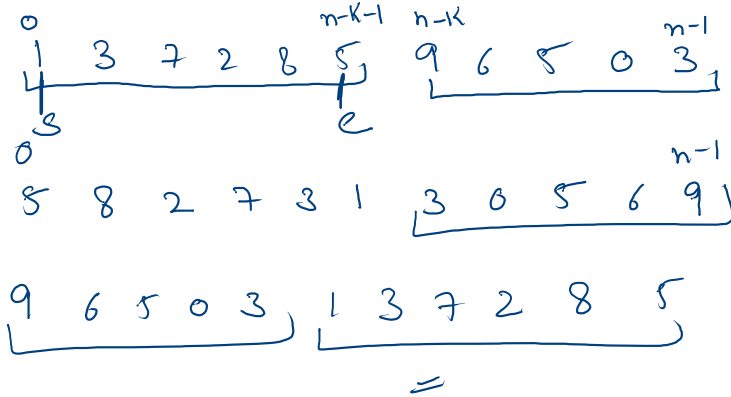
$$[3 \quad 9 \quad 4 \quad 6 \quad \boxed{2 \quad 8 \quad 5}] \quad K=3$$

$\underbrace{\hspace{1.5cm}}_a \quad \underbrace{\hspace{1.5cm}}_b$

6 4 9 3 5 8 2

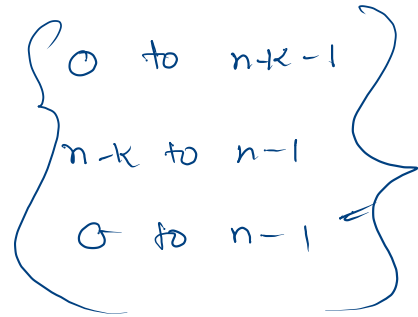
$$\underbrace{2 \quad 8 \quad 5}_w \quad \underbrace{3 \quad 9 \quad 4 \quad 6}_w$$

$$\left\{ \begin{array}{cc} \overline{a} & \overline{b} \\ \overline{a'} & \overline{b'} \\ \overline{b''} & \overline{a''} \\ \overline{b} & \overline{a} \end{array} \right\}$$



$$k = 5$$

[]



$n+n$ $O(2n) \approx O(n)$

Circle around $O(n)$ with arrow pointing to $O(1)$