Max Min ☆

145/563 challenges solved

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Problem Solving ★★★★★★

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You will be given a list of integers, arr, and a single integer k. You must create an array of length k from elements of arr such that its unfairness is minimized. Call that array $subarr$. Unfairness of an array is calculated as

$$max(subarr) - min(subarr)$$

Where:

- max denotes the largest integer in $subarr$.

- min denotes the smallest integer in $subarr$.

As an example, consider the array $[1, 4, 7, 2]$ with a k of 2. Pick any two elements, test $subarr = [4, 7]$.

$unfairness = max(4, 7) - min(4, 7) = 7 - 4 = 3$

Testing for all pairs, the solution $[1, 2]$ provides the minimum unfairness.

Note: Integers in arr may not be unique.

Function Description

Complete the maxMin function in the editor below. It must return an integer that denotes the minimum possible value of unfairness.

maxMin has the following parameter(s):

- k: an integer, the number of elements in the array to create
- arr: an array of integers .

Input Format

The first line contains an integer n, the number of elements in array arr.

The second line contains an integer k.

Each of the next n lines contains an integer $arr[i]$ where $0 \leq i < n$.

Constraints

$2 \leq n \leq 10^5$

$2 \leq k \leq n$

$0 \leq arr[i] \leq 10^9$

Output Format

An integer that denotes the minimum possible value of unfairness.

Sample Input 0

```
7
3
10
100
300
200
1000
20
30
```

Sample Output 0

```
20
```

Explanation 0

Here $k = 3$; selecting the 3 integers $10, 20, 30$, unfairness equals

```
max(10,20,30) - min(10,20,30) = 30 - 10 = 20
```

Sample Input 1

```
10
4
1
2
3
4
10
20
30
40
100
200
```

Sample Output 1

```
3
```

Explanation 1

Here $k = 4$; selecting the 4 integers $1, 2, 3, 4$, unfairness equals

```
max(1,2,3,4) - min(1,2,3,4) = 4 - 1 = 3
```

Sample Input 2

```
5
2

1
```

```
2
1
2
1
```

Sample Output 2

```
0
```

Explanation 2

Here $k = 2$. $subarr = [2, 2]$ or $subarr = [1, 1]$ give the minimum unfairness of 0.

Current Buffer (saved locally, editable) Java 8

```
1  import java.io.*;
2  import java.math.*;
3  import java.security.*;
4  import java.text.*;
5  import java.util.*;
6  import java.util.concurrent.*;
7  import java.util.regex.*;
8
9  public class Solution {
10
11     // Complete the maxMin function below.
12     static int maxMin(int k, int[] arr) {
13
14
15     }
16
17     private static final Scanner scanner = new Scanner(System.in);
18
19     public static void main(String[] args) throws IOException {
20         BufferedWriter bufferedWriter = new BufferedWriter(new
   FileWriter(System.getenv("OUTPUT_PATH")));
21
22         int n = scanner.nextInt();
23         scanner.skip("(\r\n|[\n\r\u2028\u2029\u0085])?");
24
25         int k = scanner.nextInt();
26         scanner.skip("(\r\n|[\n\r\u2028\u2029\u0085])?");
27
28         int[] arr = new int[n];
29
30         for (int i = 0; i < n; i++) {
31             int arrItem = scanner.nextInt();
32             scanner.skip("(\r\n|[\n\r\u2028\u2029\u0085])?");
33             arr[i] = arrItem;
34         }
35
36         int result = maxMin(k, arr);
```

```
37
38          bufferedWriter.write(String.valueOf(result));
39          bufferedWriter.newLine();
40
41          bufferedWriter.close();
42
43          scanner.close();
44      }
45  }
46
```

Line: 1 Col: 1

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