ADAlab Online Judge

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going to process q operations, where each operation will be:

- `1 x` : Add number x
- `2 x` : Delete number x. Ignore this operation if x is not present.
- `3` : Report the absolute difference between the largest odd number and the smallest even number
- `4` : Report the absolute difference between the smallest odd number and the largest even number

Input

The first line contains n and q.

The next line contains n integers: the given numbers initially

The following q lines are the queries given in the format mentioned in the problem description.

Restrictions

- $1 \le n, q \le 10^6$
- all numbers are within range $[-10^9, 10^9]$

Output

For each query of type 3 and 4, print the answer in one line. If there is no odd number or even number, print "QQ" (without quotation mark).

Sample Input 1 📋

```
5 10
4 8 7 6 3
3
4
2 7
2 3
3
1 9
1 9
3
2 9
3
```

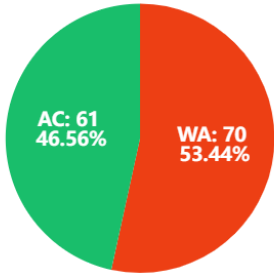## Sample Output 1

```
3
5
QQ
5
5
```

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ℹ Information

ID	2
Time Limit	3000MS
Memory Limit	256MB
IO Mode	Standard IO
Created By	ta_redleaf
Level	Hidden
Score	100
Tags	Show

◔ Statistic   Details

■ AC   ■ WA

AC: 61 46.56%
WA: 70 53.44%

Language: C++ ▾   ↻   Theme: Solarized Light ▾

☁

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ℹ About ⌄

✅ You have solved the problem

⚠ Contest has ended

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Sample Test Input

```
5 10
4 8 7 6 3
3
4
2 7
2 3
3
1 9
1 9
3
2 9
3
```

Sample Test Output