

Contest Duration: 2025-04-27(Sun) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250427T2100&p1=248>) - 2025-04-27(Sun) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250427T2240&p1=248>) (local time) (100 minutes)

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## G - Odd Position Sum Query

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Time Limit: 4 sec / Memory Limit: 1024 MiB

Score : 600 points

### Problem Statement

There is an initially empty sequence  $A$ .

You are given  $Q$  queries to process in order. The  $i$ -th query is explained below:

You are given an integer  $y_i$ . If  $i = 1$ , let  $z$  be 0; otherwise, let  $z$  be the answer to the  $(i - 1)$ -th query. Define  $x_i = ((y_i + z) \bmod 10^9) + 1$ . Append  $x_i$  to the end of  $A$ .

Then, let  $B = (B_1, B_2, \dots, B_m)$  be the sequence  $A$  sorted in ascending order, and find the sum of the odd-indexed elements of  $B$ . That is, find  $B_1 + B_3 + B_5 + \dots + B_m$ , where  $m$  is the largest odd number not exceeding  $i$ .

### Constraints

- $1 \leq Q \leq 3 \times 10^5$
- $0 \leq y_i < 10^9$
- $1 \leq x_i \leq 10^9$
- All input values are integers.

## Input

The input is given from Standard Input in the following format:

```
Q  
y1  
y2  
:  
yQ
```

## Output

Print  $Q$  lines. The  $i$ -th line should contain the answer to the  $i$ -th query.

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### Sample Input 1

Copy

```
5  
1  
3  
1  
999999994  
999999993
```

Copy

### Sample Output 1

Copy

```
2  
2  
8  
6  
1000000006
```

Copy

- For the 1st query,  $y_1 = 1$ ,  $z = 0$ , so  $x_1 = ((1 + 0) \bmod 10^9) + 1 = 2$ . Appending this to the end of  $A$  gives  $A = (2)$ . Sorting  $A$  in ascending order yields  $B = (2)$ , and the sought value is  $B_1 = 2$ .
- For the 2nd query,  $y_2 = 3$ ,  $z = 2$ , so  $x_2 = ((3 + 2) \bmod 10^9) + 1 = 6$ . Appending gives  $A = (2, 6)$ , so  $B = (2, 6)$  and the sought value is  $B_1 = 2$ .
- For the 3rd query,  $y_3 = 1$ ,  $z = 2$ , so  $x_3 = ((1 + 2) \bmod 10^9) + 1 = 4$ . Appending gives  $A = (2, 6, 4)$ , so  $B = (2, 4, 6)$  and the sought value is  $B_1 + B_3 = 8$ .
- For the 4th query,  $y_4 = 999999994$ ,  $z = 8$ , so  $x_4 = ((999999994 + 8) \bmod 10^9) + 1 = 3$ . Appending gives  $A = (2, 6, 4, 3)$ , so  $B = (2, 3, 4, 6)$  and the sought value is  $B_1 + B_3 = 6$ .

- For the 5th query,  $y_5 = 999999993$ ,  $z = 6$ , so  $x_5 = ((999999993 + 6) \bmod 10^9) + 1 = 1000000000$ . Appending gives  $A = (2, 6, 4, 3, 1000000000)$ , so  $B = (2, 3, 4, 6, 1000000000)$  and the sought value is  $B_1 + B_3 + B_5 = 1000000006$ .

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## Sample Input 2

Copy

```
8
105282053
695234822
468007124
120710491
568831200
700753895
765188109
262666319
```

Copy

## Sample Output 2

Copy

```
105282054
105282054
905798931
599798602
995656103
891549225
1652393438
1652393438
```

Copy

Below are the values of  $x_1, x_2, \dots, x_8$  in order:

```
105282054
800516877
573289179
26509423
168629803
696409999
656737335
915059758
```

'#telegram)

url=https%3A%2F%2Fcoder.jp%2Fcontests%2Fabc403%2Ftasks%2Fabc403\_g%3Flang%3Den&title=G%20-Query)

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