

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 $B = (B_1, B_2, \dots, B_i)$ 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.

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Input

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

Q
 y_1
 y_2
 \vdots
 y_Q

Output

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

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 $B_1 + B_3 = 6$.

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- 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 $B_1 + B_3 + B_5 = 1000000006$.

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%2Fatcoder.jp%2Fcontests%2Fabc403%2Ftasks%2Fabc403_g%3Flang%3Den&title=G%20-Query)

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