Amazing Factor Sequence (medium)

Warning

Here is a harder version of **Amazing Factor Sequence**.

To make things clear, you'll need a O(n^0.5) method to solve this problem. You'll need to be careful with container of C-like language, and/or you'll need to find some little optimizations with slower language.

The factor sequence

We define our factor sequence with:

$$a[0] = a[1] = 0$$
, and

for n > 1, $a[n] = a[n - 1] + sum({x | x < n and n % x = 0}).$

Input

First line of input contains an integer *T*, the number of test cases.

Each of the next T lines contains a single integer n.

Output

For each test case, print **a[n]** on a single line.

Example

Input:

3

3

5

Output:

2

5

6

Constraints

```
0 < T < 101
0 < n < 12148001999
```

Numbers n are uniform-randomly chosen. Nmax was carefully chosen ;-) Time limit is $\times 2.5$ my python one (2.56s). (Edited 2017-02-11, after compiler changes)