5083 Goldbach's conjecture

You must have heard of Goldbach's conjecture, a well-known unsolved problem in number theory. It is stated that every even integer greater than 2 can be written as a sum of two prime numbers. Simple, yet extremely hard! No mathematician has been able to prove this conjecture for nearly 300 years. For example:

```
 4 = 2 + 2
 6 = 3 + 3
 8 = 3 + 5
10 = 3 + 7
   = 5 + 5
12 = 5 + 7
```

```
14 = 3 + 11
   = 7 + 7
16 = 3 + 13
   = 5 + 11
18 = 5 + 13
   = 7 + 11
...
```

Let $G(N)$ be the number of different ways to represent a number of the form $2N$ as a sum of two prime numbers. As we have seen in the above examples:

$$G(i) = 1, 1, 1, 2, 1, 2, 2, 2 \text{ for } i = 2..9$$

With the definition of $G(N)$, the Goldbach's conjecture can be stated as follows: $G(N) > 0$ for all positive integers $N > 1$.

Given a number N, your task is to write a program to compute the following sum:

$$F(N) = G(2) + G(3) + \ldots + G(N)$$

Input

The input file consists of several data sets. The first line of the input file contains the number of data sets which is a positive integer and is not bigger than 20. The following lines describe the data sets.

Each data set consists of only one line which contains an integer N ($3 \leq N \leq 500000$).

Output

For each data set, write in a single line the sum $F(N)$.

Sample Input

```
3
7
4
9
```

Sample Output

```
8
3
12
```