Easy Problem of Prime

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

One day, Brz was studying prime factorization of positive integers, which struck Mandy as a surprise: isn't it something that she had totally grasped in the second grade?

So she told Brz the traditional prime factorization by multiplication was old-fashioned, and now she was more interested in prime factorization by addition.

To introduce, Mandy showed Brz an easy problem as follows:

Let $f(n)$ be the least number of prime numbers whose sum is exactly n, calculate $\sum_{i=2}^{n} f(i)$.

For example, $f(2) = 1, f(6) = 2$, since $2 = 2$ and $6 = 3 + 3$. It can be proved that there aren't fewer prime numbers that satisfy the condition.

Since Brz had never studied the field of prime factorization by addition, he was confused. Can you help him find the answer?

Input

The first line contains one integer Q ($1 \leq Q \leq 10^6$), representing that there are Q queries.

Each of the following Q lines contains one integer n ($2 \leq n \leq 10^7$), which is used in the calculation.

Output

Output Q lines. The i-th line contains one integer representing the answer to the i-th query.

Example

standard input	standard output
3 3 4 5	2 4 5