Knowledge is Power

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Knowledge is power. Little Rabbit and Little Horse both long for more knowledge, so they always challenge each other to some quizzes. Today, Little Rabbit creates a new quiz for Little Horse.

Little Rabbit gives Little Horse a positive integer x. Little Horse needs to find a set of integers $S = \{a_1, a_2, \ldots, a_n\}$ that meets the following conditions.

- $n \geq 2$
- $a_i > 1$, for $1 \leq i \leq n$
- $\sum_{i=1}^{n} a_i = x$
- a_i and a_j are co-prime, for any $i \neq j$

For example, if $x = 12$, then $S = \{3, 4, 5\}$ and $S = \{5, 7\}$ and $S = \{2, 3, 7\}$ are all valid sets. Two integers are said to be co-prime if the only positive integer that evenly divides both of them is 1.

We define $a_{\max}$ as the maximum element of S, and $a_{\min}$ as the minimum element of S. Little Rabbit wants the value of $(a_{\max} - a_{\min})$ to be as small as possible. Can you help Little Horse to find the minimum value of $(a_{\max} - a_{\min})$?

Input

The first line of the input contains an integer T ($1 \leq T \leq 10^5$) — the number of test cases.

Each test case contains an integer x ($5 \leq x \leq 10^9$) — the integer Little Rabbit gives to Little Horse.

Output

For the x-th test case, if the answer is y, output *Case #x*: y in a single line. If there's no possible solution, output *Case #x*: -1 in a single line.

Example

standard input	standard output
4 5 6 7 10	Case #1: 1 Case #2: -1 Case #3: 1 Case #4: 3