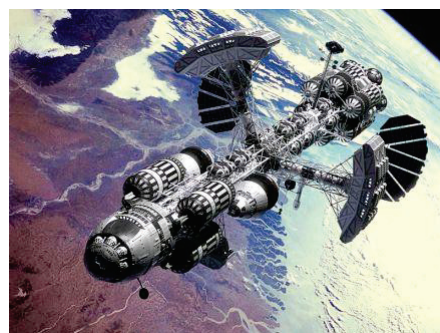# Problem C
Space Station
Time Limit: 2 seconds

The Moon is shining, especially in Mid-Autumn night. Do you want to explore the Moon? It would not be possible for everyone to visit the Moon. However, you can enjoy a virtual trip in a virtual spaceship from the Earth to the Moon. Now, let us board the spaceship. You are an astronaut!

The virtual spaceship flights directly from the Earth to the Moon in a single line. Each point in the path from the Earth to the Moon is labeled with a positive integer that is the distance from the Earth to that point.

Each space station is built at the location whose label is a prime number to provide supply for spaceships. As you are looking for food and water supply, you should find the nearest space station.

Input

The input consists of multiple test cases.

The first line of input contains an integer T ($1 \leq T \leq 100$), the number of test cases. Each of the next T lines describes one test case. Each test case contains a positive integer A ($2 \leq A \leq 10^6$) that is the current location of your spaceship.

Output

Display the result of each test case in a separate line. For each test case, display an integer that is the shortest distance (in absolute value) from the current location of your spaceship to the nearest space station.

Sample Input

Sample Input	Sample Output
4	1
4	5
122	2
25	0
65537	