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Tobby and the divisors - II

Time limit: 2 s
Memory limit: 256000 MBytes
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Tobby is a smart dog who loves coding. Tobby has always been told that the most important part of coding is doing class diagrams and that algorithmic complexity is irrelevant. Santiago, Tobby's teacher, wants to teach Tobby the importance of algorithmic complexity with a simple problem:

"Given an integer number N, what is the positive integer number less than or equal to N that has the most divisors? If there are several integers less than or equal to N with the maximum amount of divisors, what is the smallest integer among them?"

Santiago gave Tobby an example: when N is equal to three, both two and three have two divisors and therefore the answer is two, being the smallest one.

Santiago also told Tobby the following:

"The number of divisors of an integer M is the amount of integers between 1 and M that divide M exactly. That is, the number of integers X between 1 and M such that $M\%X = 0$."

Santiago then asked Tobby for the answer to the problem with numbers N less than or equal to 2500.

After Tobby solved that version of the problem, Santiago asked Tobby for the answer to the problem with numbers N less than or equal to 1000000. Tobby tried to solve the problem using the same code used for the easier version of the problem and got a "Time Limit" verdict. Tobby then asked Santiago for clues about how to solve this new version of the problem and Santiago told him:

"If we start counting from 1 to N, how many numbers less than or equal to N divide each number? 1 divides all the N numbers, 2 divide about $N/2$ numbers, 3 divides about $N/3$ numbers, and so on."

Tobby then realized that if we wanted to know for each number between 1 and N how many numbers divide each one of them, we could start a count array in 0 for all numbers and then we could add 1 to the count of all the N numbers which 1 divides, then add 1 to the count of all the approximately $N/2$ numbers which 2 divides, and so on.

Tobby then asked himself: how many times would I end up adding to the count array? He realized that the answer to his question is the solution to the equation: sum for all i between 1 and N of $1/N$.

Input

The first line contains an integer A (such that $1 \leq A \leq 50$). Then there are A lines, each one with an integer N (such that $1 \leq N \leq 1000000$).

Output

For each number N in the input you must print the positive integer less than or equal to N that has the highest number of divisors. If there are several numbers less than or equal to N with the maximum number of divisors then you must print the smallest integer among them.

Example input

```
3
3
20
2000
```

Example output

```
2
12
1680
```

Problem setter: Santiago Gutierrez.