

5779 Vampire Numbers

The number 1827 is an interesting number, because $1827=21*87$, and all of the same digits appear on both sides of the '='. The number 136948 has the same property: $136948=146*938$.

Such numbers are called *Vampire Numbers*. More precisely, a number v is a Vampire Number if it has a pair of factors, a and b , where $a * b = v$, and together, a and b have exactly the same digits, in exactly the same quantities, as v . None of the numbers v , a or b can have leading zeros. The mathematical definition says that v should have an even number of digits and that a and b should have the same number of digits, but for the purposes of this problem, we'll relax that requirement, and allow a and b to have differing numbers of digits, and v to have any number of digits. Here are some more examples:

```
126 = 6 * 21
10251 = 51 * 201
702189 = 9 * 78021
29632 = 32 * 926
```

Given a number X , find the smallest Vampire Number which is greater than or equal to X .

Input

There will be several test cases in the input. Each test case will consist of a single line containing a single integer X ($10 \leq X \leq 1,000,000$). The input will end with a line with a single '0'.

Output

For each test case, output a single integer on its own line, which is the smallest Vampire Number which is greater than or equal to X . Output no extra spaces, and do not separate answers with blank lines.

Sample Input

```
10
126
127
5000
0
```

Sample Output

```
126
126
153
6880
```