

6076 Yukari's Birthday

Today is Yukari's n -th birthday. Ran and Chen hold a celebration party for her. Now comes the most important part, birthday cake! But it's a big challenge for them to place n candles on the top of the cake. As Yukari has lived for such a long long time. Though she herself insists that she is a 17-year-old girl.

To make the birthday cake look more beautiful, Ran and Chen decide to place them like $r \geq 1$ concentric circles. They place k^i candles equidistantly on the i -th circle, where $k \geq 2$, $1 \leq i \leq r$. And it's optional to place at most one candle at the center of the cake. In case that there are a lot of different pairs of r and k satisfying these restrictions, they want to minimize $r \times k$. If there is still a tie, minimize r .

Input

There are about 10,000 test cases. Process to the end of file.

Each test consists of only an integer $18 \leq n \leq 10^{12}$.

Output

For each test case, output r and k .

Sample Input

```
18
111
1111
```

Sample Output

```
1 17
2 10
3 10
```