

B Battle of Nieuwpoort

Time limit: 1s

The battle of Nieuwpoort occurred in the year 1600. This is famously easy to remember, because it ends in two zeros. Alas, not all historical events have been so obliging!

You suspect that the problem is with the fixation of historians on the decimal system. Maybe, given the year of another battle, there exists a small base (at most 16) in which this year would also be easy to remember?



Prince Maurice at the Battle of Nieuwpoort, 2 July 1600,
Pauwels van Hillegaert (1596–1640),
Oil on panel, circa 1632–1640.
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Input

The input consists of:

- One line with 4 tokens:
 - One integer y ($1 \leq y \leq 2024$, in base-10), the year of the battle.
 - Three words w ($2 \leq |w| \leq 20$), naming the battle.
 - The words only consist of English letters (A–Z and a–z).

Output

If it is possible to rewrite the year to make it easier to remember, output this base b ($2 \leq b \leq 16$, in base-10) and the year written in base- b . Otherwise, output “impossible”.

The year in base- b must end with “00” and must not start with ‘0’.

Use letters ‘a’, ‘b’, ‘c’, etc. for the digits following ‘9’ in bases higher than 10.

If there are multiple valid solutions, you may output any one of them.

Sample Input 1

1600 Battle of Nieuwpoort

Sample Output 1

10 1600

Sample Input 2

625 Battle of Sarus

Sample Output 2

5 10000

Sample Input 3

1600 Battle of Sekigahara

Sample Output 3

8 3100

Sample Input 4

1815 Battle of Waterloo

Sample Output 4

11 1400

Sample Input 5

1859 Battle of Solferino

Sample Output 5

13 b00

Sample Input 6

1848 Battle of Bov

Sample Output 6

2 11100111000

Sample Input 7

1453 Fall of Constantinople

Sample Output 7

impossible
