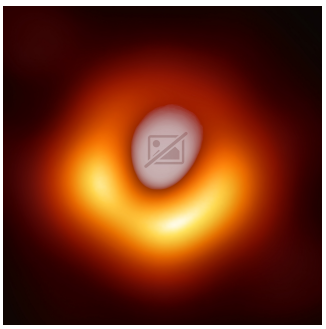
I Imperfect Imperial Units

Time limit: 4s

You are writing a paper for the Beta Astronomy Physics Conference about your recent discovery on grey holes. One of your collaborators has performed a huge number of measurements, which you would like to analyse in order to draw some conclusions. The only problem is: the data is measured in a wide variety of units, and to your disgust, they appear to use a mix of the imperial and metric systems. To simplify your analysis, you need to convert all these measurements into a different unit.



False-colour image of a grey hole. CC BY 4.0 European Southern Observatory, modified

Input

The input consists of:

- One line with two integers n and q ($1 \leq n \leq 100$, $1 \leq q \leq 10\,000$), the number of unit conversion equations and the number of queries to answer.
- n lines, each defining a unit conversion in the format "`1 <unit> = <value> <unit>`".
- q lines, each with a query in the format "`<value> <unit> to <unit>`".

In these formats, "`<value>`" is a floating-point number v ($0.001 \leq v \leq 1000$, with at most 9 digits after the decimal point) and "`<unit>`" is a string of at most 20 English lowercase letters (`a–z`). A unit in a query is guaranteed to be defined in at least one unit conversion equation. Every unit can be converted into every other unit in *at most* one way.

Output

For every query, output the value of the requested unit, or "`impossible`" if the query cannot be answered.

Your answers should have a *relative* error of at most 10^{-6}.

Sample Input 1

```
4 3
1 foot = 12 inch
1 yard = 3 foot
1 meter = 100 centimeter
1 centimeter = 10 millimeter
750 millimeter to meter
42 yard to inch
10 meter to foot
```

Sample Output 1

```
0.75
1512
impossible
```

Sample Input 2

```
4 3
1 fortnight = 14 day
1 microcentury = 0.036525 day
1 microcentury = 1000 nanocentury
1 week = 7 day
22.2 fortnight to nanocentury
2.5 nanocentury to week
3.14 day to fortnight
```

Sample Output 2

```
8509240.2464065708427
1.3044642857142857142e-05
0.22428571428571428572
```

Sample Input 3

```
10 2
1 micrometer = 1000 nanometer
1 millimeter = 1000 micrometer
1 meter = 1000 millimeter
1 kilometer = 1000 meter
1 megameter = 1000 kilometer
1 lightsecond = 299.792458 meter
1 lightminute = 60 lightsecond
1 lighthour = 60 lightminute
1 lightday = 24 lighthour
1 lightyear = 365.25 lightday
42 nanometer to lightyear
42 lightyear to nanometer
```

Sample Output 3

```
4.439403502903384947e-18
3.9735067984839359997e+20
```