

# Mei and the Magic Runes

## Problem ID: meimagicrune

Mei, the renowned archaeologist, discovered some ancient text about runes believed to have magical properties. There are three basic runes: “heaven”, “earth”, and “life.” A sequence of basic runes forms a composed rune. However, a composed rune can never begin with “life,” as placing “life” before “heaven” and “earth” was considered blasphemy by the ancient people.

According to the ancient text, any two composed runes can be combined to form a new rune, but the exact rules of the combining operation are lost. Fortunately, Mei has already uncovered some examples of combining runes as listed below:

1. Combining “heaven life” and “heaven” results in “heaven heaven.”
2. Combining “heaven life” and “earth” results in “heaven earth.”
3. Combining “heaven life” and “heaven life” results in “earth life.”
4. Combining “heaven” and “heaven” results in “earth.”
5. Combining “heaven” and “earth” results in “heaven life.”
6. Combining “earth” and “earth” results in “heaven heaven.”
7. Combining “heaven life life” and “earth life” results in “heaven earth life.”
8. Combining “earth life heaven” and “earth earth earth” results in “heaven earth life life.”
9. Combining “earth earth earth earth” and “heaven” results in “heaven life life life life.”
10. The result of combining two runes, A and B, is the same as combining B and A.
11. The result of combining any three runes is the same no matter which two are combined first.

Can you believe it? According to Mei, this ancient culture once followed a formal, computational philosophy that explained the universe as an immense computing machine. The rune combining rules is the key to understanding their culture in more detail. Can you guess what was in the mind of the ancient people? Write a program that outputs the result of combining the two input runes.

### Input

The first line of the input contains two positive numbers:  $1 \leq n, m \leq 1000$ , the number of basic runes in the two composed runes to be combined. The second and the third line each describes a composed rune. They contain space-separated basic runes: “heaven”, “earth”, or “life” (without quotes, lowercase only).

### Output

Output a single line of space-separated basic runes that describes the result of composing the two input runes.

#### Sample Input 1

```
3 3
heaven heaven heaven
heaven heaven life
```

#### Sample Output 1

```
earth earth heaven
```