

British Informatics Olympiad Final

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Fibonacci's Revenge

A sequence of strings is generated as follows: the first two strings are given and each successive string is made by joining together the previous two strings (in their original order). For example, if the first string is `abc` and the second string is `cde`, the third string will be `abccde` and the fourth will be `cdeabccde`.

The task for this question is to determine the i^{th} character in the sequence of strings (*not* the i^{th} string). In the previous example the 2^{nd} character is `b`, the 5^{th} is `d`, as is the 11^{th} . The 13^{th} character, which happens to be the 1^{st} character of the 4^{th} term, is `c`.

Write a program that reads in three lines. The first line will contain the first string, of between 1 and 10 characters, using lower case letters. The second line will contain the second string, again between 1 and 10 lower case letters. The third line will be a single integer i ($1 \leq i \leq 2^{30}$). You should output the i^{th} character in the sequence.

Sample Input

```
fibonacci
revenge
1000000
```

Sample Output

```
e
```