

# Build a Palindrome

You have two strings,  $a$  and  $b$ . Find a string,  $s$ , such that:

- $s$  can be expressed as  $s = s_a + s_b$  where  $s_a$  is a non-empty substring of  $a$  and  $s_b$  is a non-empty substring of  $b$ .
- $s$  is a palindromic string.
- The length of  $s$  is as long as possible.

For each of the  $q$  pairs of strings ( $a_i$  and  $b_i$ ) received as input, find and print string  $s_i$  on a new line. If you're able to form more than one valid string  $s_i$ , print whichever one comes first alphabetically. If there is no valid answer, print  $-1$  instead.

## Input Format

The first line contains a single integer,  $q$ , denoting the number of queries. The subsequent lines describe each query over two lines:

- The first line contains a single string denoting  $a$ .
- The second line contains a single string denoting  $b$ .

## Constraints

- $1 \leq q \leq 10$
- $1 \leq |a|, |b| \leq 10^5$
- $a$  and  $b$  contain only lowercase English letters.
- Sum of  $|a|$  over all queries does not exceed  $2 \times 10^5$
- Sum of  $|b|$  over all queries does not exceed  $2 \times 10^5$

## Output Format

For each pair of strings ( $a_i$  and  $b_i$ ), find some  $s_i$  satisfying the conditions above and print it on a new line. If there is no such string, print  $-1$  instead.

## Sample Input

```
3
bac
bac
abc
def
jdfh
fds
```

## Sample Output

```
aba
-1
dfhfd
```

## Explanation

We perform the following three queries:

1. Concatenate  $s_a = \text{"a"}$  with  $s_b = \text{"ba"}$  to create  $s = \text{"aba"}$ .
2. We're given  $a = \text{"abc"}$  and  $s_a = \text{"def"}$ ; because both strings are composed of unique characters, we cannot use them to form a palindromic string. Thus, we print  $-1$ .
3. Concatenate  $s_a = \text{"dfh"}$  with  $s_b = \text{"fd"}$  to create  $s = \text{"dfhfd"}$ . Note that we chose these particular substrings because the length of string  $s$  must be maximal.