



# Super Functional Strings

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Problem

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We define a function,  $F$ , on a string,  $P$ , as follows:

$$F(P) = \left( \text{length}(P)^{\text{distinct}(P)} \right) \% (10^9 + 7)$$

where:

- $\text{length}(P)$  denotes the number of characters in string  $P$ .
- $\text{distinct}(P)$  denotes the number of distinct characters in string  $P$ .

Consuela loves creating string challenges and she needs your help testing her newest one! Given a string,  $S$ , consisting of  $N$  lowercase letters, compute the summation of function  $F$  (provided above) over all possible *distinct substrings* of  $S$ . As the result is quite large, print it modulo  $10^9 + 7$ .

## Input Format

The first line contains a single integer,  $T$ , denoting the number of test cases.  
Each of the  $T$  subsequent lines contains a string,  $S$ .

## Constraints

- $1 \leq T \leq 100$
- $1 \leq N \leq 10^5$
- The sum of  $N$  over all test cases does not exceed  $10^5$ .

## Scoring

- $N \leq 100$  for 20% of test data.
- $N \leq 1000$  for 40% of test data.
- $N \leq 10^5$  for 100% of test data.

## Output Format

For each test case, print the answer modulo  $10^9 + 7$ .

## Sample Input

```
3
aa
aba
abc
```

## Sample Output

```
3
19
```

**Explanation***Test 0:*

"a" and "aa" are the only distinct substrings.

- $F("a") = (1^1) \% 1000000007 = 1$
- $F("aa") = (2^1) \% 1000000007 = 2$

$$ans = (1 + 2) \% 1000000007 = 3$$

*Test 1:*

"a", "b", "ab", "aba", and "ba" are the only distinct substrings.

- $F("a") = (1^1) \% 1000000007 = 1$
- $F("ab") = (2^2) \% 1000000007 = 4$
- $F("aba") = (3^2) \% 1000000007 = 9$
- $F("b") = (1^1) \% 1000000007 = 1$
- $F("ba") = (2^2) \% 1000000007 = 4$

$$ans = (1 + 4 + 9 + 1 + 4) \% 1000000007 = 19$$

f t in


Submissions: 280

Max Score: 80

Difficulty: Advanced

Rate This Challenge:

☆☆☆☆☆

[More](#)Current Buffer (saved locally, editable)  

Java 7



```

1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }

```

Line: 1 Col: 1

 [Upload Code as File](#)
☐ Test against custom input

Run Code

Submit Code

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