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Home » Compete » SnackDown Online Pre-elimination round A » N different palindromes

## N different palindromes

Problem code: NDIFFPAL

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A palindrome is a string that reads same in both directions: forwards and backwards. For example, the strings **radar** and **noon** are palindromes, whereas the string **chef** is not a palindrome as being read backwards becomes equal to **fehC**, which is not equal to **chef**.

Let's say that the pair of indices  $(i, j)$  denotes a palindrome in some string **S** iff  $i \leq j$  and the substring starting at the  $i$ -th character and ending at the  $j$ -th character of **S** is a palindrome.

Given an integer **N**. Your task is to construct a string **S** such that there are exactly **N** different pairs  $(i, j)$  that denotes a palindrome.

### Input

The first line of the input contains an integer **T** denoting the number of test cases. The description of **T** test cases follows.

The first line of each test case contains a single integer **N** denoting the sought number of pairs that denote palindrome.

### Output

For each test case, output a single line containing a string **S**, consisting of lowercase Latin letters, and having exactly **N** distinct palindrome-denoting pairs. If there's a few such strings, output any one.

If such string **S** doesn't exist, output **-1** instead of it.

### Constraints

- $1 \leq T \leq 100$
- $1 \leq N \leq 10^4$

### Example

Input:

```
3
6
7
2
```

Output:

```
noon
radar
ab
```

### Explanation

**Example case 1.** In the string "noon", the pairs that denote a palindrome are (1-indexed):  $(1, 1)$ ,  $(1, 4)$ ,  $(2, 2)$ ,  $(2, 3)$ ,  $(3, 3)$ ,  $(4, 4)$ .

**Example case 2.** In the string "radar", the pairs that denote a palindrome are (1-indexed):  $(1, 1)$ ,  $(1, 5)$ ,  $(2, 2)$ ,  $(2, 4)$ ,  $(3, 3)$ ,  $(4, 4)$ ,  $(5, 5)$ .

**Example case 3.** In the string "ab", the pairs denoting a palindrome are :  $(1, 1)$ ,  $(2, 2)$

Author: xcwgf666

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Time Limit: 1 sec

Source Limit: 50000 Bytes

Languages:

ADA, ASM, BASH, BF, C, C99 strict, CAML, CLOJ, CLPS, CPP 4.3.2, CPP 4.9.2, CPP14, CS2, D, ERL, FORT, FS, GO, HASK, ICK, ICON, JAVA, JS, LISP disp, LISP sbcl, LUA, NEM, NICE, NODEJS, PAS fpc, PAS gpc, PERL, PERL6, PHP, PIKE, PRLG, PYPY, PYTH, PYTH 3.1.2, RUBY, SCALA, SCM chicken, SCM guile, SCM qobi, ST, TCL, TEXT, WSPC

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