

Dortmund Dilemma

Borussia Dortmund is a famous football (soccer) club from Germany. Apart from their fast style of playing, the thing that makes them unique is the hard to pronounce names of their players (blaszczykowski , papastathopoulos , großkreutz etc.).

The team's coach is your friend. He is in a dilemma as he can't decide how to make it easier to call the players by name, during practice sessions. So, you advised him to assign easy names to his players. A name is easy to him if

1. It consists of only lowercase english letters.
2. It's length is exactly N .
3. It contains **exactly** K different letters from the **26** letters of english alphabet.
4. At least one of its **proper** prefixes matches with its **proper** suffix of same length.

Given, N and K you have to tell him the number of easy names he can choose from modulo (10^9+9) .

Note : A prefix P of a name W is proper if, $P \neq W$. Similarly, a suffix S of a name W is proper if, $S \neq W$.

Input

The first line of the input will contain T (the number of testcases).

Each of the next T lines will contain two space separated integers N and K .

Output

For each testcase, output the number of ways the coach can assign names to his players modulo (10^9+9) .

Constraints

$$1 \leq T \leq 10^5$$

$$1 \leq N \leq 10^5$$

$$1 \leq K \leq 26$$

Example

Input:

```
8
1 1
2 1
4 2
2 2
5 1
3 2
6 2
```

1 3

Output:

0

26

2600

0

26

650

13650

0