

Dortmund Dilemma



Borussia Dortmund are a famous football (soccer) club from Germany. Apart from their fast-paced 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 advise him to assign easy names to his players. A name is easy to him if

- 1. It consists of only one word.
- 2. It consists of only lowercase english letters.
- 3. Its length is **exactly** N .
- 4. It contains **exactly** K different letters from the **26** letters of English alphabet.
- 5. 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 Format

The first line of the input will contain T (the number of testcases). Each of the next T lines will contain 2 space separated integers N and K .

Output Format

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

Constraints

$$1 \leq T \leq 10^5$$
$$1 \leq N \leq 10^5$$
$$1 \leq K \leq 26$$

Sample Input #1

```
3
1 1
2 1
4 2
```

Sample Output #1

```
0
26
2600
```

Sample Input #2

```
5
2 2
5 1
3 2
6 2
1 3
```

Sample Output #2

```
0
26
650
13650
0
```