Spell Casting

Time Limit: 1 Second
Memory Limit: 2048 MB

Harry has learned a new magical spell. Whenever he sees a number x, he can point his wand at the number and use the spell. Then the number becomes $\phi(x)$. Now, Harry sees the number N, and he wants to turn it into 1, but casting spells is very tiring. Therefore, he asks you to calculate the minimum number of times he needs to cast spells to turn N into 1.

Input

The first line contains an integer t ($1 \leq t \leq 50$), denoting the number of tests.

The first line of each test contains an integer m ($1 \leq m \leq 2000$), denoting the number of distinct prime factors of N.

On each of the next m lines of each test, there are two integers p_i, q_i ($1 \leq p \leq 10^5, 1 \leq q \leq 10^9$) such that $N = \Pi_{i=1}^{m} p_i^{q_i}$ (basically, we've given you the prime factorization of N).

Output

Print t lines, the answer for each test case.

Sample Inputs

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

Sample Outputs

```
3
```