

Problem D

Conquistador

Rune Johan is a nice young boy and a clever student, but he has had little luck engaging persons of the female persuasion in fruitful conversation. He was very grateful when the computer science department organised a ball, and invited the first grade nurse students. There he saw *her*, the woman of his dreams. But as most of us do in such situations, he froze up, and did not dare to approach her.



After a few days of regretting his lack of action, Rune Johan decides to make up for it. He finds her name, Celina Middleware, but does not want to contact her before he has made a decent plan. He starts by locating one of her friends, Bjørgfrid, and invites her to a cup of coffee. After a few minutes of conversation, Bjørgfrid tells that she has some trouble with her computer. Rune Johan makes a deal with her. He will fix her computer if she tells him everything he needs to know about Celina.

It turns out that Celina likes many different kinds of boys, but she is still rather picky. He could be intelligent, cultivated and well dressed, or own a motorcycle and be slightly rude. Or he could simply be rich. Rune Johan writes down all the information, and goes home to finish his plan. He makes an estimate of how many weeks it would take to fulfil each of the criteria, and tries to decide which combination takes less time. He thinks that he can work on all of them in parallel.

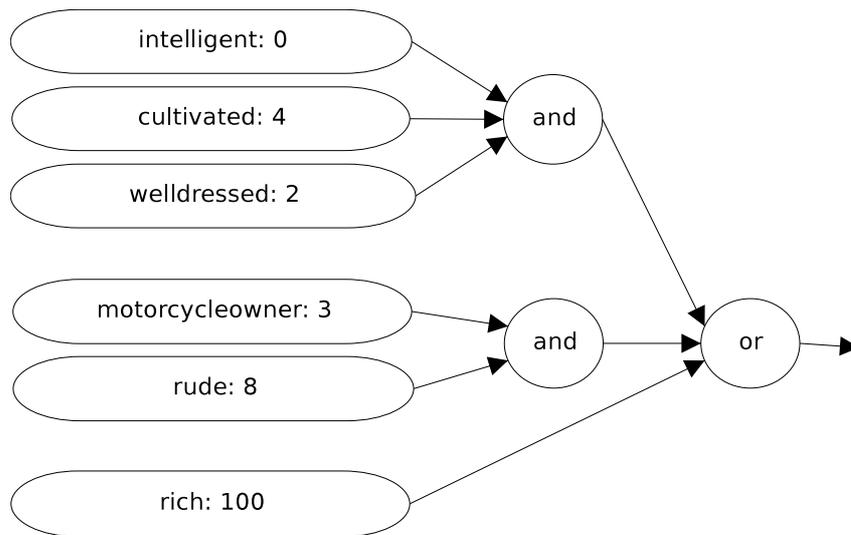


Figure 1: What Rune Johan must become to conquer Celina Middleware.

Input specifications

The first line of input gives the number of test cases, which is at most 100. Each test case is given as two strings on separate lines. The first string gives the time costs of fulfilling the criteria, separated by commas. Each cost is given by a string giving the name of the criterion, a colon, and then the integer time cost of the criterion in weeks. The names contain symbols 'a' to 'z', and their length is from 1 to 20. The costs are between 0 and 1000 inclusive. There will be no more than 20 different criteria.

The second string gives the combinations of criteria which will satisfy miss Middleware. Each combination is separated by the symbol '&', and the criteria are separated by the symbol '|'. There will be between 1 and 10 combinations in each scenario. Each combination will contain at least one criterion, and name no criterion more than once.

Output specifications

For each test scenario, output a line with the minimum time cost in weeks for satisfying Celina's desires.

Sample input

```
3
intelligent:0,cultivated:4,welldressed:2,motorcycleowner:3,rude:8,rich:100
intelligent&cultivated&welldressed|motorcycleowner&rude|rich
ab:13,b:17,cab:21
ab&b|b&cab
a:14,b:13,c:14,d:11
a&b&c|d&a&c|a|b&d
```

Output for sample input

```
4
17
13
```