



3487 - Duopoly

Asia - Hangzhou - 2005/2006

The mobile network market in country XYZ used to be dominated by two large corporations, XYZ Telecom and XYZ Mobile. The central government recently has realized that radio frequency spectrum is a scarce resource and wants to regulate its usage. The spectrum currently in use is divided into 300,000 channels. Any wireless service provider who wishes to use certain spectrum should apply for licenses on these channels. While some services may require use of multiple channels, a single channel can not be shared by different services.

The central government wants to maximize its revenue from the spectrum by putting the channels up to an auction. The only two bidders are XYZ Telecom and XYZ Mobile. They are allowed to place bids on combinations of channels, through which their services can communicate with the customers. Furthermore, the government stipulates that a company can only place at most one bid on a specific channel.

The government can only accept a subset of the bids so none of them would conflict with each other. However, officials soon find out that it is a difficult task to determine the winning bids in order to maximize the revenue, and they are asking for your help.

Input

Standard input will contain multiple test cases. The first line of the input is a single integer T ($1 \leq T \leq 10$) which is the number of test cases. T test cases follow, each preceded by a single blank line.

Each test case has two bid description sections, which are for XYZ Telecom and XYZ Mobile, respectively. Each section starts with an integer N ($1 \leq N \leq 3,000$), which is the number of bids that follow. The next N lines each contain the description for one bid, the first integer P ($1 \leq P \leq 1,000$) gives the price of that bid, followed by the channel numbers required by this service. A service would require at least 1 channel and at most 32 channels. Each channel number is a positive integer and will never exceed 300,000.

Output

Results should be directed to standard output. Start each case with "Case # : " on a single line, where # is the case number starting from 1. Two consecutive cases should be separated by a single blank line. No blank line should be produced after the last test case.

For each test case, print the maximized revenue the government is able to collect by issuing licenses on the channels.

Sample Input

```
2
3
45 1
51 2
62 3
4
```

```
54 1
15 2
33 3
2 4 5

5
20 1
18 2
23 4
54 3 5 6
17 7
4
36 1 2 3
28 5
47 4 7
16 6
```

Sample Output

```
Case 1:
169
```

```
Case 2:
139
```

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