

H - The Writer's Club

Input: standard input

Output: standard output

Forget Facebook, forget Second Life, *The Writers Club* is the next big thing on the Internet. The Writers Club is where both writers and lovers of short stories get to meet, publish, read, and discuss the writers promising contributions. As any other Internet virtual community, the website gives readers the facility to create a list of their favourite writers. The website maintainers have noticed that readers tend to favour writers already favoured by the readers favourite writers. For example, if John likes the stories written by Alice, then many of the readers who likes Johns stories also like Alices. Needless to say, Johns readers tend to also admire Alices favourite writers too.

The website would like to start a recommendation service based on this observation. Continuing with the above example, the website would like to recommend Alice (and her favourite writers, and their favourite writers, and so on) to all of Johns readers. Of course, the recommendation service has to be smart enough not to recommend a writer already favoured by the reader receiving the recommendation.

Input

Your program will be tested on one or more test cases. The rst line of each test case includes two positive integers (T and N) where T is the total number of users (not exceeding 100,000) and N is the number of writers (not exceeding 100). N lines follow, one for each writer. Each line is made fo one or more names, the first being the name of a writer and the remaining being the names of admirers of that writer. For example:

```
writer reader1 reader2 ...readerd
```

where **writer** is the name of a writer and **reader₁ ...reader_d** are the names of that writer's admirers.

A name is a sequence of one or more lower case letters, no longer than 16 characters. Names are unique throughout the test case. Names are separated by one or more spaces.

The last line of the input is made of two zeros.

Output

For each test case, the first line of output should be:

```
---_CASE_k
```

Where k is the test case number (starting at 1,) $_$ is a single space, and '-' is the minus sign.

Following that, there should be zero or more lines, one line for each writer being recommended.

The format is:

```
writer_reader1_reader2_...
```

where **writer** is the name of the writer to be recommended for all said readers. The output lines should be sorted alphabetically according to writers, and for each writer, readers should also be sorted alphabetically. No writer should be recommended for himself. All names in the output are separated by a single space.

Sample Input

```
7 3
john paul ringo
alice paul john
bob alice sunny cher
5 3
tantawi taha najeeb
aqqad najeeb ehsan
taha aqqad najeeb
0 0
```

Sample Output

```
--- CASE 1
alice ringo
bob john paul ringo
--- CASE 2
taha ehsan
tantawi aqqad ehsan
```