British Informatics Olympiad Final

12–14 April, 1996

Sponsored by Data Connection

Connecting Towns

Given a list of roads directly connecting pairs of towns, you are required to find how many disjoint sets of towns there are. Two towns are in the same set if it is possible to reach one from the other by one road or a combination of roads. Two towns are in disjoint sets if it is not possible to get between the towns on the given roads.

For example there are two disjoint sets, {AAAAA,BBBBB,CCCCC} and {DDDDD,EEEEE} in the following map :

AAAAA ----- BBBBB ----- CCCCC

DDDDD ----- EEEEE

Your input data will consist of a list of roads (given by the two towns they connect), terminated with the word "XXXXX". All towns will consist of five letters. There will be no list of the towns given - you should assume the only towns of interest are those which occur in the roads list. No two towns share the same name, and no town will be called "XXXXX".

There will be no more than 250 towns in any list, though the list may contain several million roads. Note roads can be travelled in both directions, and may be given either way round. Due to the carelessness of mapmakers, town planning committees and the Pentium floating point bug, roads may be listed more than once.

Your output should consist of the number of towns, followed by the number of disjoint sets.

First Example

```
AAAAA BBBBB
CCCCC BBBBB
DDDDD EEEEE
XXXXX
```

```
5 2
```

Second Example

```
WURRP AMIER
IHFLC NARST
RCOQA DNATC
NARST GDRIF
XXXXX
```

```
7 3
```