Choose Your Own Adventure

Filename: `adventure`

When you were a kid you used to read the Choose Your Own Adventure series, where, on each page, you had a question to answer. Based on your answer, you were told to go to one page or another page for the story to continue. This continued until you reached a page with an ending. The books were always arranged so that you always started on page one and you could never read the same page twice in a story. If that were possible, the story could possibly never end. You loved the suspense of these books, but were frustrated that you paid good money for them and usually only read about 5 pages before you were done with the whole story! Now that you've taken some computer science in high school, you've decided to dig those books out of the attic to see if you can find the longest possible adventure each book has to offer, so you can finally get your money's worth!

The Problem:

Given a list of each page in a Choose Your Own Adventure novella and which page(s) each page forwards to, determine the longest possible story (in number of pages) that the user could possibly read, following the proper rules of the book.

The Input:

There will be multiple books in the input file. The first input line contains a positive integer, n, indicating the number of books to be processed. The details about each book follow. The first line of each book description contains a positive integer, p ($1 < p < 1000$), representing the number of pages in the book. The following p lines will contain information about each page (from 1 to p). Namely, those pages will list each page to which the current page forwards. If the page does not have an ending on it, there will either be one or two forwarding page numbers listed. If there are two pages, the two numbers will be separated by a single space. If the page is one that has an ending, then the line will read "`ENDING`". The forwarding pages will be set up so that no page may ever be read twice in a single story.

The Output:

For each book, output a single line with the following format:

`Book #`*`k`*`: The longest story is `*`x`*` pages.`

where k is the book number, starting at 1, and x is the number of pages in the longest possible story for that book.

Sample Input:

```
2
3
2 3
ENDING
ENDING
5
4 5
ENDING
2
3
4
```

Sample Output:

```
Book #1: The longest story is 2 pages.
Book #2: The longest story is 5 pages.
```