Problem 9: Fit In The Box

Difficulty: Hard

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Problem Background

Some words can be extremely lengthy. Some sentences can also seem to drag on and on, without ever seeming to end, or even come to a definite conclusion. Regardless of how long or short your words and sentences are, when typing, you'll eventually run out of room. Sheets of paper are only so large, and word processors will automatically "wrap" long paragraphs across multiple lines to make sure it all fits.

Word wrapping takes place in other scenarios as well. Graphic and web designers often make use of "text boxes" - regions of a particular size that contain text. If text is too large to fit in a text box, it can wrap to multiple lines; like a piece of paper, however, there's only so much room in a text box. Some applications may automatically expand text boxes, but others will simply hide the text that doesn't fit.

Problem Description

Your team is working on a word wrapping algorithm for a new web design tool being used by Lockheed Martin Communications. The tool's text boxes allow designers to define their height and width in numbers of characters to display; for the purposes of this problem, all printable characters are the same height and width. If a line of text doesn't fit on a single line within the text box, your tool will need to break the text across multiple lines. Lines should only be broken on spaces between words, and as late as possible to allow the text to fit.

For example, consider the sentence below:

```
This is a long sentence that does not fit on a single line, and so it will break
across two lines.
```

This page can hold up to 70 characters (of that size) on a single line. The sentence above, through the word "it," has 69 characters. There isn't enough room for the rest of the sentence, and so the space between "it" and "will" is replaced with a line break. The sentence now takes up two lines as a result.

The width of a text box determines where lines should be broken, but text boxes are also limited in height. If the text is broken across too many lines, it won't fit, and you will need to display a warning message to the user.

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include:

- A line containing two positive integers separated by spaces, representing the width and height of the text box, respectively.
- A line containing a string of text (which may contain any printable characters) to be placed within the text box, if possible.

```
2
30 2
This is the sample input for this problem.
40 1
This is the second test case for the sample input, which won't fit.
```

Sample Output

For each test case, your program must determine if the given text can fit within the text box's dimensions. If it can, your program must print the given text, with lines broken as necessary to allow it to fit. Otherwise, your program must print a line with the words "WILL NOT FIT."

```
This is the sample input for
this problem.
WILL NOT FIT
```