6. A certain primitive text-formatting system allows one to write superscripts and subscripts in one's text as follows:

```
In this equation, we may substitute for the
derivative to get x_{n+1} = x_{n} + (y-x_{n}^{2})/2x_{n},
which solves the problem.  For the cube root,
the corresponding equation is
    x_{n+1} = x_{n} + (y-x_{n}^{3})/3x^{2}_{n}.
```

and have them converted as follows:

```
In this equation, we may substitute for the
                                  2
derivative to get x    = x  + (y-x )/2x ,
                   n+1    n       n    n
which solves the problem.  For the cube root,
the corresponding equation is
                    3    2
    x    = x  + (y-x )/3x .
     n+1    n       n    n
```

Each character of regular text can have a subscript or superscript (or both). The formatter adds an extra line above any line containing superscripts and below any line containing subscripts, and places the text between the curly braces at the appropriate places on these lines. Use separate sub- and superscript lines for each line that needs them (that is, don't put superscripts from one line on the line containing subscripts from the one above it). Input text to the right of the sub- or superscripted component gets moved to so that it begins just to the right of the subscript or superscript on the preceding text, whichever is longer. For example,

```
                           3
x^{3}_{k+1}+1   becomes   x   +1
                           k+1
```

Write a program that performs these transformations. The input consists of a text file with subscript and superscript annotations. You may assume that the text of subscripts and superscripts does not contain subscripts, superscripts, newlines, or curly braces, and that there is at most one subscript and one superscript for each regular character (so '`x_{n}_{y}`' is illegal). The input will always be well formed: each underscore or caret is followed by a left curly brace, followed by text that is bracketed by a right curly brace.

Aside from moving around the subscripts and superscripts as shown, preserve all blanks and newlines. There will be no tabs in the input.