Technical Test

Graphical editors allow users to edit images in the same way text editors let us modify documents. Images are represented as an M x N array of pixels with each pixel given color. Produce a program that simulates a simple interactive graphical editor.

Input

The input consists of a line containing a sequence of commands. Each command is represented by a single capital letter at the start of the line. Arguments to the command are separated by spaces and follow the command character.

Pixel co-ordinates are represented by a pair of integers: 1) a column number between 1 and M, and 2) a row number between 1 and N. Where 1 <= M, N <= 250. The origin sits in the upper-left of the table. Colors are specified by capital letters.

Commands

The editor supports 7 commands:

1. `I M N`. Create a new M x N image with all pixels colored white (O).
2. `C`. Clears the table, setting all pixels to white (O).
3. `L X Y C`. Colors the pixel (X,Y) with color C.
4. `V X Y1 Y2 C`. Draw a vertical segment of color C in column X between rows Y1 and Y2 (inclusive).
5. `H X1 X2 Y C`. Draw a horizontal segment of color C in row Y between columns X1 and X2 (inclusive).
6. `F X Y C`. Fill the region R with the color C. R is defined as: Pixel (X,Y) belongs to R. Any other pixel which is the same color as (X,Y) and shares a common side with any pixel in R also belongs to this region.
7. `S`. Show the contents of the current image
8. `X`. Terminate the session

Example

In the example below, > denotes input, => denotes program output.

```
> I 5 6
> L 2 3 A
> S
=>
OOOOO
OOOOO
OAOOO
OOOOO
OOOOO
OOOOO
> F 3 3 J
> V 2 3 4 W
> H 3 4 2 Z
> S
=>
JJJJJ
JJZZJ
JWJJJ
JWJJJ
JJJJJ
JJJJJ
```