Something About Airplanes

input file: `planes.in`

Aircraft Closeting and Management (ACM) provides hangar service for aircraft. When hired by an airport, ACM builds two hangars facing each other. The number of planes the hangars can hold depends on the demand expected by the airport. As aircraft arrive, they are put in either the left or right hangar, depending on which is less full. If both hangars have the same number of empty spaces, planes are directed to the hangar with fewer planes. If both hangars have the same number of free spaces and the same number of planes, a new plane is put in the left hangar. If there are no more spaces, a message is printed and the plane is turned away. When a plane is put into a hangar, it blocks all the other planes in the hangar.

For example, suppose ACM provided two hangars for Florida International Tourists (FIT) Airport, the left hangar with a capacity of 5 planes and the right with a capacity of 3. When the first plane, Plane1, arrives, it will be put into the left hangar, since there are 5 empty spaces in the left hangar and 3 empty spaces in the right hangar:

Left hangar (1 of 5 spaces full)

Plane1				

Right hangar (0 of 3 spaces full)

When the second plane, Plane2, arrives, it will be put into the left hangar, since there are 4 empty spaces in the left hangar and 3 empty spaces in the right hangar:

Left hangar (2 of 5 spaces full)

Plane1	Plane2			

Right hangar (0 of 3 spaces full)

When the third plane, Plane3, arrives, it will be put into the right hangar since both hangars have 3 empty spaces and there are fewer planes in the right hangar.

Left hangar (2 of 5 spaces full)

Plane1	Plane2			

Right hangar (1 of 3 spaces full)

		Plane3

When the fourth, fifth, and sixth planes, Plane4, Plane5, and Plane6, arrive, they will be placed according to the rules as shown:

Left hangar (4 of 5 spaces full)

Plane1	Plane2	Plane4	Plane6	

Right hangar (2 of 3 spaces full)

	Plane5	Plane3

As aircraft leave, the planes blocking it are moved to the other hangar, in reverse order of arrival. If there is not enough space to move all of the blocking planes into the other hangar, the plane is not allowed to leave. So, if in the scenario above, Plane3 wanted to leave, Plane5 would be moved into the left hangar and Plane3 would leave:

Left hangar (5 of 5 spaces full)

Plane1	Plane2	Plane4	Plane6	Plane5

Right hangar (0 of 3 spaces full)

Finally, if Plane1 wanted to leave, it could not, because there is not enough space in the right hangar for Plane5, Plane6, Plane4, and Plane2. No planes would move in this case.

ACM has asked you to write simulation software to see how well this hangar scheme will work.

Input

The input file will have one or more data sets. The first line of each dataset will be a line which begins with the word "`Airport:`" followed by 0 or more spaces and the name of the airport (a string of 1 or more characters). The second line will have two integers, *left* and *right*, 0 < *left* < 101, 0 < *right* < 101, the capacity of the left and right hangars. There will then be one or more lines of commands. These may be:

- Plane arrivals. The line will begin with the word "`Arrival:`" followed by 0 or more spaces and the name of plane (a string of 1 or more characters). Blanks at the ends of plane names should be removed. Case is significant in plane names. You may assume that a plane that arrives will have a name different from any other plane already in the hangars. The plane should be put into the left or right hangar based on the given rules. If there is no empty space available, print the message:

  plane-name `could not be parked.`

- Plane departures. The line will begin with the word "`Departure:`" followed by 0 or more spaces and the name of plane (a string of 1 or more characters). You may assume that a plane that arrives will be in one of the hangars. If the plane cannot be removed, print the message:

  plane-name `could not be removed.`

- Updates. The line will begin with the word "`Display:`" followed by 0 or more spaces and one of "`left`", "`right`", or "`both`". Print the name and contents of the named hangar(s), one plane per line, starting with the plane nearest the exit, using the format shown in the sample output. If both hangars are printed, the left should be printed first.

The end of input will be indicated by the word "`Done`" on a line by itself.

Output

For each data set, print a line with the name of the airport. Then produce any output created by the data commands. Have a blank line after the output for each data set.

Sample input

```
Airport: Florida International Tourists' Airport
5 3
Arrival: Plane1
Arrival:Plane2
Arrival:Plane 3
Arrival:    Plane four
Arrival: Plane5
```

```
Arrival: Six
Display: left
Departure: Plane 3
Display:right
Arrival: Seven
Departure:  Plane1
Arrival: Eight
Departure: Six
Display:    both
Airport: Waldo General
1 1
Arrival: Crop duster
Arrival: Stunt plane
Arrival: Cessna
Display: both
Done:
```

Sample output (corresponding to sample input)

```
Airport: Florida International Tourists' Airport
Left hangar:
   Six
   Plane four
   Plane2
   Plane1
Right hangar:
Plane1 could not be removed.
Left hangar:
   Plane four
   Plane2
   Plane1
Right hangar:
   Plane5
   Eight
   Seven

Airport: Waldo General
Cessna could not be parked
Left hangar:
   Crop duster
Right hangar:
   Stunt plane
```