

Interview Assignment

Please answer each question as completely as possible. Email responses to team@dotalign.com.

You can use whatever programming language you like to answer this question. If you're not submitting C#, please provide clear and complete instructions on how to compile and run the code.

1. Messages Database

Message		
Id	Subject	MessageText
1	A once in a lifetime chance	To whom it may concern...
2	Demo follow up	Dear sir or madam, ...
...

ParticipantType	
Id	Type
1	From
2	To
3	CC
4	BCC

Participant			
Id	ParticipantTypeId	EmailAddressId	MessageId
1	1	1	1
2	2	2	1
3	2	3	1
4	1	2	2
5	2	3	2
6	3	4	2
...

Person	
Id	Name
1	John Doe
2	Janet Smith
3	Robert Strong
4	Susan Jones
...	...

EmailAddress			
Id	AddressText	DomainId	PersonId
1	John.Doe@gmail.com	1	1
2	john@ValiCorp.com	2	1
3	jsmith@FWork.com	3	2
4	rstrong@FWork.com	3	3
5	daisies@gmail.com	1	3
6	susan@ValiCorp.com	2	4
...

Domain	
Id	UrlText
1	gmail.com
2	ValiCorp.com
3	FWork.com
...	...

Given the above database tables (with some sample data) write a SQL query that...

1. ... lists of each domain in the system
2. ... lists of each email address along with the owner's real name
3. ... lists each domain and the total number of emails sent to it (combining To, CC, & BCC)



2. On Golden Pond

You are writing a simulation of ducks on a curiously rectangular pond. A duck's position and location is represented by a combination of x and y co-ordinates and a letter representing one of the four cardinal compass points. The pond is divided up into a grid to simplify navigation. An example position might be 0, 0, N, which means the duck is in the bottom left corner and facing North.

In order to control a duck, you send a simple string of letters. The possible letters are 'P', 'S' and 'F'. 'P' and 'S' makes the duck spin 90 degrees toward port side (left) or starboard (right) respectively, without moving from its current spot. 'F' means move forward one grid point, and maintain the same heading.

Assume that the square directly North from (x, y) is (x, y+1).

Input

The first line of input is the upper-right coordinates of the pond, the lower-left coordinates are assumed to be 0,0.

The rest of the input is information pertaining to the ducks being simulated. Each duck has two lines of input. The first line gives the duck's position, and the second line is a series of instructions telling the duck how to explore the pond.

The position is made up of two integers and a letter separated by spaces, corresponding to the x and y co-ordinates and the duck's orientation.

Each duck will be finished sequentially, which means that the second duck won't start to move until the first one has finished moving.

Output

The output for each duck should be its final co-ordinates and heading.

Input and Output

Test Input

```
5 5
1 2 N
PFPFPFPFF
3 3 E
FFSFFSFSF
```

Expected Output

```
1 3 N
5 1 E
```