ccu13b02: Frog on a line

Problem Description

There are n cells in a line and a frog jumps on the line. The cells are consecutively labeled by 0 to n-1. The frog keeps its direction unless some instruction orders it to turn. At each cell, there is an instruction for the frog, which is a nonzero integer. An instruction of a positive integer k orders the frog to jump further k cells in its current direction. If k<0, the frog turns, i.e., changes its direction, and then jump further -k cells in its new direction.

Given an initial position and direction, there are three possible results:

Forward out-of-range: jumping to a cell with label larger than n-1;

Backward out-of-range: jumping to a cell with label smaller than 0;

Cycle: infinitely repeating among some cells.

Your job is to determine which result it will be.

Input

The input consists of several test cases and each case contains one array of instructions and several initial situations. The first line has two integers n and m, in which 0<=n<=10000 is the number of cells and m is the number of initial situations. The next line contains n integers which are the instructions. Followed the second line, there are m lines, one for an initial situation. Each initial situation contains two integers p and q, in which 0<=p<n is the initial cell and q is either 1 or -1, indicating the initial direction. Direction 1 means that the frog currently jumps from small to large. The case with n=0 is the end of input.

Output

For each case, print the result in one line: You should output

“Forward” if it is forward out-of-range; .

“Backward” if it is backward out-of-range; or

“Cycle k” if it repeats in a cycle of k cells.

Sample Input

```
7 4
1 -2 4 1 -3 -5 7
1 -1
2 1
5 -1
5 1
0 0
```

Sample Output

```
Cycle 3
Forward
Forward
Backward
```