

## D. Permutation Game

time limit per test: 2 seconds  
 memory limit per test: 256 megabytes  
 input: standard input  
 output: standard output

Bodya and Sasha found a permutation  $p_1, \dots, p_n$  and an array  $a_1, \dots, a_n$ . They decided to play a well-known "Permutation game".

A permutation of length  $n$  is an array consisting of  $n$  distinct integers from 1 to  $n$  in arbitrary order. For example,  $[2, 3, 1, 5, 4]$  is a permutation, but  $[1, 2, 2]$  is not a permutation (2 appears twice in the array), and  $[1, 3, 4]$  is also not a permutation ( $n = 3$  but there is 4 in the array).

Both of them chose a starting position in the permutation.

The game lasts  $k$  turns. The players make moves simultaneously. On each turn, two things happen to each player:

- If the current position of the player is  $x$ , his score increases by  $a_x$ .
- Then the player either **stays** at his current position  $x$  or **moves** from  $x$  to  $p_x$ .

The winner of the game is the player with the higher score after exactly  $k$  turns. Knowing Bodya's starting position  $P_B$  and Sasha's starting position  $P_S$ , determine who wins the game if both players are trying to win.

### Input

The first line contains a single integer  $t$  ( $1 \leq t \leq 10^4$ ) — the number of testcases.

The first line of each testcase contains integers  $n, k, P_B, P_S$  ( $1 \leq P_B, P_S \leq n \leq 2 \cdot 10^5$ ,  $1 \leq k \leq 10^9$ ) — length of the permutation, duration of the game, starting positions respectively.

The next line contains  $n$  integers  $p_1, \dots, p_n$  ( $1 \leq p_i \leq n$ ) — elements of the permutation  $p$ .

The next line contains  $n$  integers  $a_1, \dots, a_n$  ( $1 \leq a_i \leq 10^9$ ) — elements of array  $a$ .

It is guaranteed that the sum of values of  $n$  over all test cases does not exceed  $2 \cdot 10^5$ .

### Output

For each testcase output:

- "Bodya" if Bodya wins the game.
- "Sasha" if Sasha wins the game.
- "Draw" if the players have the same score.

### Example

input

```
10
4 2 3 2
4 1 2 3
7 2 5 6
10 8 2 10
3 1 4 5 2 7 8 10 6 9
5 10 5 1 3 7 10 15 4 3
2 1000000000 1 2
```

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### Codeforces Round 943 (Div. 3)

Finished

Practice



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Start virtual contest

### → Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

### → Submit?

Language: GNU G++20 13.2 (64 bit, wi)

Choose file: Choose File No file chosen

Submit

### → Problem tags

dfs and similar games graphs math

No tag edit access

### → Contest materials

- Announcement (en)
- Tutorial (en)

```
1 2
4 4
8 10 4 1
5 1 4 3 2 8 6 7
1 1 2 1 2 100 101 102
5 1 2 5
1 2 4 5 3
4 6 9 4 2
4 2 3 1
4 1 3 2
6 8 5 3
6 9 5 4
6 1 3 5 2 4
6 9 8 9 5 10
4 8 4 2
2 3 4 1
5 2 8 7
4 2 3 1
4 1 3 2
6 8 5 3
2 1000000000 1 2
1 2
1000000000 2
```

output

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```
Bodya
Sasha
Draw
Draw
Bodya
Sasha
Sasha
Sasha
Sasha
Bodya
```

Note

Below you can find the explanation for the first testcase, where the game consists of  $k = 2$  turns.

Turn	Bodya's position	Bodya's score	Bodya's move	Sasha's position	Sasha's score	Sasha's move
first	3	$0 + a_3 = 0 + 5 = 5$	stays on the same position	2	$0 + a_2 = 0 + 2 = 2$	moves to $p_2 = 1$
second	3	$5 + a_3 = 5 + 5 = 10$	stays on the same position	1	$2 + a_1 = 2 + 7 = 9$	stays on the same position
final results	3	10		1	9	

As we may see, Bodya's score is greater, so he wins the game. It can be shown that Bodya always can win this game.

