December Circuits '18 LIVE

Dec 21, 2018, 09:00 PM IST - Dec 30, 2018, 09:00 PM IST

00 : 06 : 20
HRS   MIN   SEC

INSTRUCTIONS   PROBLEMS   SUBMISSIONS   LEADERBOARD   ANALYTICS   JUDGE

LIVE EVENTS

← Problems / Beautiful Pairs

Beautiful Pairs

Max. Marks: 100

You live in a city that consists of N restaurants. Each restaurant has a unique index between 1 and N (both inclusive) and value denoted by the array V . A unique path exists between every pair of restaurants, which implies that each restaurant can be reached from every other restaurant. You are given an integer P. Your task is to solve Q queries of the following form:

$A\ B\ L_1\ R_1\ L_2\ R_2$

where A and B are the indices of two distinct restaurants and $L_1, R_1, L_2,$ and R_2 are positive integers. For each query, determine the total number of ordered pairs of restaurants (X, Y) such that the following conditions hold:

- X lies in the unique path between the restaurants A and B

- A lies in the unique path between the restaurants X and Y

- $L_1 \le (V_X \% P) \le R_1$

- $L_2 \le (V_Y \% P) \le R_2$

- $A,\ B,\ X,$ and Y should be pairwise distinct

Input format

- First line: Three space-separated integers N , Q, and P
- Second line: N space-separated integers with i^{th} integer denoting V_i
- Next $N - 1$ lines: Two space-separated integers U and V denoting a bidirectional path from restaurant U to V and vice versa
- Next Q lines: Six space-separated integers $IN_1, IN_2, IN_3, IN_4, IN_5,$ and IN_6 describing one query. Let $last$ denote the answer of the previous query (if its first query then $last$ = 0). The parameters of the query can be calculated by the following conditions:
  - $A = IN_1 \oplus last$
  - $B = IN_2 \oplus last$
  - $L_1 = IN_3 \oplus last$
  - $R_1 = IN_4 \oplus last$
  - $L_2 = IN_5 \oplus last$
  - $R_2 = IN_6 \oplus last$

where $\oplus$ is the symbol for the bitwise **XOR**.

Output format

For each query, print the answer on a separate line.

Constraints

$2 \le N, Q \le 10^5$

$1 \le A, B \le N$ and $A \neq B$

$1 \le L_1, R_1, L_2, R_2, P, V_i \le 10^9$

$L_1 \le R_1\ and\ L_2 \le R_2$

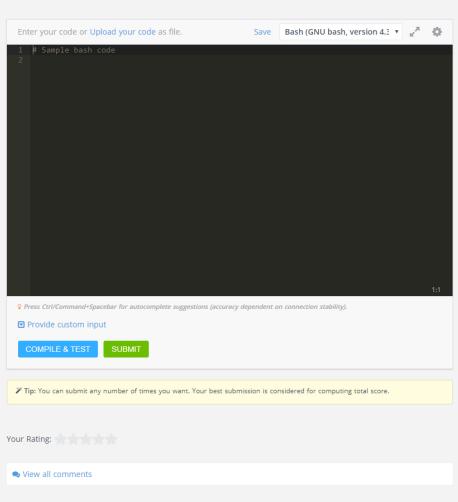### Subtasks

- For 10 points: $2 \le N, Q \le 100$
- For 20 points: $2 \le N, Q \le 5000$
- For 70 points: Original Constraints

SAMPLE INPUT	SAMPLE OUTPUT
11 5 20	6
10 5 6 10 10 10 10 10 10 10 10	8
1 2	0
1 3	0
2 4	2
2 5	
4 6	
4 7	
5 8	
3 9	
9 10	
9 11	
4 9 1 20 1 20	
2 13 7 18 7 18	
12 3 9 1 9 1	

```
4 2 1 10 1 10
4 1 1 10 1 10
```

Explanation

For the first query the possible pairs satisfying all the conditions are (1,6), (2,6), (3,6), (1,7), (2,7) and (3,7).

Time Limit:	2.0 sec(s) for each input file.
Memory Limit:	256 MB
Source Limit:	1024 KB
Marking Scheme:	Marks are awarded if any testcase passes.
Allowed Languages:	Bash, C, C++, C++14, Clojure, C#, D, Erlang, F#, Go, Groovy, Haskell, Java, Java 8, JavaScript(Rhino), JavaScript(Node.js), Julia, Kotlin, Lisp, Lisp (SBCL), Lua, Objective-C, OCaml, Octave, Pascal, Perl, PHP, Python, Python 3, Racket, Ruby, Rust, Scala, Swift, Swift-4.1, Visual Basic

CODE EDITOR

Enter your code or Upload your code as file.   Save   Bash (GNU bash, version 4.3 ▾)

```
1  # Sample bash code
2
```

                                                                                                1:1

💡 *Press Ctrl/Command+Spacebar for autocomplete suggestions (accuracy dependent on connection stability).*

▣ Provide custom input

COMPILE & TEST   **SUBMIT**

Your Rating: ⭐⭐⭐⭐⭐

💬 View all comments