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Aneesh's Fortune

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Aneesh is very happy because he won a fortune of **P rupees**. In order to prevent a fight in his family as to who will inherit how much money, he lays out an unbreakable rule: Each person except Aneesh himself inherits money from his parent. A person's money would be **divided equally** (Aneesh is very resourceful and made sure the precision is infinite) among his children on the person's death.

You are given Aneesh's family tree of n people. To avoid names, we have assigned a number to each person (1 to n); **aneesh being 1**. You have answer **q queries**. Each query consists of 2 numbers describing 2 people in the family (maybe the same). You have to answer which of them will inherit more money. To avoid the money to be split too much, each person has **atmost 2 children**.

It can be proved that the answer to any query of the above form is **independent of P**

Input Format

First line consists of two space separate integers **n , q**

Next **n-1** lines consist of **1** integer each : **ith** line has x_i which describes the parent of **(i+1)th** person

Next **q** lines consist of **2** integers each : **ith** line consists of a_i and b_i describing the two people being queried

Constraints

$2 \le n,q \le 10^5$

$1 \le x_i \le n$

$1 \le a_i, b_i \le n$

Output Format

Output consists of **q** lines. Each line consists of **1** integer expressing your answer to the **ith** query

if a_i inherits more than b_i, output **-1**

if a_i inherits less than b_i, output **1**

if a_i inherits equal to b_i, output **0**

Sample Input 0

```
4 5
1
2
3
1 4
2 4
3 4
4 1
3 2
```

Sample Output 0

```
0
0
0
```

```
0
0
```

Explanation 0

Each person except 4th has 1 child. So the money is inherited 'undivided' down the family tree
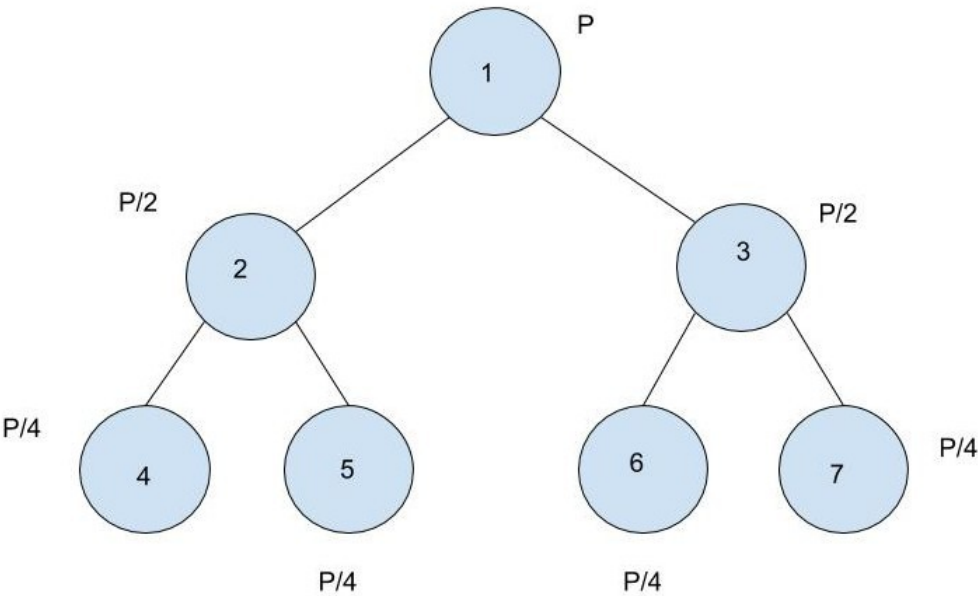
Sample Input 1

```
7 5
1
1
2
2
3
3
2 7
2 3
1 7
4 3
4 7
```

Sample Output 1

```
-1
0
-1
1
0
```

Explanation 1

Current Buffer (saved locally, editable) ⑂ 🕓

C++14 ▾   ⤢   ⚙

```cpp
1  ▼ #include <cmath>
2    #include <cstdio>
3    #include <vector>
4    #include <iostream>
5    #include <algorithm>
6    using namespace std;
7
8
9  ▼ int main() {
10 ▼     /* Enter your code here. Read input from STDIN. Print output to STDOUT */
11         return 0;
12   }
13
```

Line: 1 Col: 1

⬆ Upload Code as File   ☐ Test against custom input   Run Code   Submit Code

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