Topics Tags : Trie

Contiguous Elements XOR

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You are given an array arr[] of N positive integers. This time you are supposed to choose numbers from a contiguous subsequence of the given array, so that the BITWISE XOR of all the chosen numbers is maximum.

Example 1:

Input:
N = 4
arr[] = {8,1,2,12}
Output: 15
Explanation: 1, 2 and 12 can be chosen
from the array as contiguous sub
sequence which given us maximum
XOR value equal to 15.

```
class TrieNode{
    TrieNode[] children;

    public TrieNode(){
        this.children = new TrieNode[2];
    }
}

class Solution {

    private static TrieNode root;

    private static void insert(int n){

        TrieNode node = root;

        for(int i = 31; i >= 0; --i){
            int x = 1 & (n >> i);

            if(node.children[x] == null)
                node.children[x] = new TrieNode();

            node = node.children[x];
        }

        return;
    }

    private static int findMaxXor(int n){
        TrieNode node = root;
        int result = 0;

        for(int i = 31; i >= 0; --i){
            int x = 1 & (n >> i);
            if(node.children[1-x] != null){
                node = node.children[1-x];
                result += 1 << i;
            }
            else{
                node = node.children[x];
            }
        }

        return result;
    }

    static int maxSubarrayXOR(int arr[], int N) {
        // code here

        root = new TrieNode();
        insert(0);

        int maxXor = Integer.MIN_VALUE;
        int prefixXor = 0;

        for (int i = 0; i < N; ++i) {
            prefixXor ^= arr[i];
            maxXor = Math.max(maxXor, findMaxXor(prefixXor));
            insert(prefixXor);
        }

        return maxXor;

    }
}
```