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1  /* SPOJ - SUBXOR - SubXor
2  Given an array of N positive integers you have to print the number of subarrays
3  whose XOR is less than K. Subarrays are defined as a sequence of continuous
4  elements  $A_i, A_{i+1}, \dots, A_j$ . XOR of a subarray is defined as  $A_i \oplus A_{i+1} \oplus \dots \oplus A_j$ .
5
6  First line contains T, the number of test cases. Each of the test case consists
7  of N and K in one line, followed by N space separated integers in next line.
8
9   $1 \leq T \leq 10$ ;  $1 \leq N \leq 10^5$ ;  $1 \leq A[i] \leq 10^5$ ;  $1 \leq K \leq 10^6$ 
10 */
11 #include <bits/stdc++.h>
12 using namespace std;
13 #define ll long long
14 const int MAXN = 100005;
15 int a[MAXN], cum[MAXN];
16 struct Node{
17     int cnt;
18     Node *next[2];
19     Node(){
20         cnt = 0;
21         next[0] = next[1] = NULL;
22     }
23 }*root;
24
25 string DecToBin(int n,int msz){
26     string s;
27     while(n!=0){
28         s += (n&1) + '0';
29         n >>= 1;
30     }
31     while((int)s.size()<msz) s += '0';
32     reverse(s.begin(), s.end());
33     return s;
34 }
35
36 void Insert(string s){
37     Node *cur = root;
38     for(int i=0; i<s.size(); i++){
39         int id = s[i] - '0';
40         if(cur->next[id] == NULL) cur->next[id] = new Node();
41         cur = cur->next[id];
42         cur->cnt++;
43     }
44 }
45
46 int query(string s, string k){
47     Node *cur = root;
48     int cnt = 0;
49
50     for(int i=0; i<s.size(); i++){
51         int ids = s[i] - '0';
52         int idk = k[i] - '0';
53
54         if(ids==0 && idk==0){
55             if(cur->next[0]==NULL) return cnt;
56             cur = cur->next[0];
57         }
58         else if(ids==0 && idk==1){
59             if(cur->next[0]!=NULL) cnt += cur->next[0]->cnt;
60             if(cur->next[1]==NULL) return cnt;
61             cur = cur->next[1];
62         }
63         else if(ids==1 && idk==0){
64             if(cur->next[1]==NULL) return cnt;
65             cur = cur->next[1];
66         }

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67         else{
68             if(cur->next[1]!=NULL) cnt += cur->next[1]->cnt;
69             if(cur->next[0]==NULL)return cnt;
70             cur = cur->next[0];
71         }
72     }
73
74     return cnt;
75 }
76
77 void del(Node *cur){
78     for(int i=0; i<2; i++){
79         if(cur->next[i]) del(cur->next[i]);
80     }
81     delete(cur);
82 }
83
84 int main() {
85     int tt; scanf("%d",&tt);
86     for(int ks=1; ks<=tt; ks++){
87         int n,k; scanf("%d%d",&n,&k);
88         int maxx = 0;
89         for(int i=1; i<=n; i++){
90             scanf("%d",&a[i]);
91             maxx = max(maxx, a[i]);
92         }
93
94         int msz;
95         if(maxx == 0) msz = 1;
96         else msz = floor(log2(maxx)) + 1;
97         int msk = floor(log2(k)) + 1;
98         msz = max(msz,msk);
99
100         string s, kk;
101         s = DecToBin(0, msz);
102         kk = DecToBin(k, msz);
103
104         root = new Node();
105         Insert(s);
106
107         ll ans = 0;
108         int p = 0;
109         for(int i=1; i<=n; i++){
110             int q = p^a[i];
111             s = DecToBin(q, msz);
112
113             ans += query(s, kk);
114             Insert(s);
115             p = q;
116         }
117         printf("%lld\n",ans);
118
119         del(root);
120     }
121     return 0;
122 }
123
124 INPUT      OUTPUT
125 1          3
126 5 2
127 4 1 3 2 7
128 Only subarrays satisfying the conditions are [1], [1,3,2] and [3,2].

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