June Circuits '20

LIVE

Jun 20, 2020, 09:30 PM IST - Jun 27, 2020, 09:30 PM IST

The maximum number

Max. score: 100

Jehta a famous INTER-NIT player at delhi meets a girl and proposes her but she if so fond of mathematics that she doesn't wanna break with her ex as he was a top notch mathematician (We can not disclose). So to have better mathematician as her BF she challenges manish aka jetha and was given an array A of n elements $A_1, A_2, A_3 \ldots\ldots A_n$.

Let us define a function $F(x) = \sum_{i=1}^{n} A_i \& x$

Here & represents BIT WISE AND operator.

He needs to find the number of different values of x for which $F(x)$ is **maximized**.

But there is a constraint for x that it must have exactly l bits-set in its binary representation.

Being a good mathematician(Self-Declared) he calculated the answer just to verify wants you to do as well.

Vacancies are still open as she found that both had back-logs in the semester exams(Problem setter has good chances :)).

Your task is to find number of such values for which this function is maximised.

Print the required number.

If there are infinite such numbers output -1.

It can be proved that under the given constrainsts the value to be printed is either infinite or not greater than 1e18.

Input:

First line will contain number of test cases T.

Second line of input will contain two space seprated integers n and l (As described in the problem).

Third and final line of input contains n space seprated integers $A_1, A_2, A_3 \ldots\ldots A_n$.

Output:

There will be T lines of output:

The only line of output for each test case contains a single integer as described in problem.

Constraints:

$1 <= T <= 1000$

$1 <= l <= 30$

$1 <= N <= 20000$

$1 <= A[i] <= 1e9$

As promised he is a good mathematician but no one wants too much burden so it is guaranteed that sum of N over all test cases will not exceed 2e5.

SAMPLE INPUT

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

SAMPLE OUTPUT

```
2
1
```

Explanation

For the first test case both 5 and 6 can serve the purpose while in second test case only 4 satisfies the constraints.

Time Limit:	1.0 sec(s) for each input file.
Memory Limit:	256 MB
Source Limit:	1024 KB
Marking Scheme:	Score is assigned if any testcase passes.
Allowed Languages:	Bash, C, C++, C++14, C++17, Clojure, C#, D, Erlang, F#, Go, Groovy, Haskell, Java, Java 8, Java 14, JavaScript(Rhino), JavaScript(Node.js), Julia, Kotlin, Lisp, Lisp (SBCL), Lua, Objective-C, OCaml, Octave, Pascal, Perl, PHP, Python, Python 3, Python 3.8, Racket, Ruby, Rust, Scala, Swift-4.1, Swift, TypeScript, Visual Basic

CODE EDITOR

Save C (gcc 5.4.0)

```
1  /*
2  // Sample code to perform I/O:
3  #include <stdio.h>
```

```
4
5   int main(){
6       int num;
7       scanf("%d", &num);                              // Reading input from STDIN
8       printf("Input number is %d.\n", num);          // Writing output to STDOUT
9   }
10
11  // Warning: Printing unwanted or ill-formatted data to output will cause the test
    cases to fail
12  */
13
14  // Write your code here
15
```

LIVE EVENTS 7

1:1 vscode

Provide custom input

COMPILE & TEST SUBMIT

Tip: You can submit any number of times you want. Your best submission is considered for computing total score.

Your Rating:

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