C. Powered Addition

time limit per test

1 second

memory limit per test

256 megabytes

input

standard input

output

standard output

You have an array *a*

of length *n*. For every positive integer *x* you are going to perform the following operation during the *x*

-th second:

* Select some distinct indices *i*1,*i*2,…,*ik*

which are between 1 and *n* inclusive, and add 2*x*−1 to each corresponding position of *a*. Formally, *aij*:=*aij*+2*x*−1 for *j*=1,2,…,*k*

* . Note that you are allowed to not select any indices at all.

You have to make *a*

nondecreasing as fast as possible. Find the smallest number *T* such that you can make the array nondecreasing after at most *T*

seconds.

Array *a*

is nondecreasing if and only if *a*1≤*a*2≤…≤*an*

.

You have to answer *t*

independent test cases.

Input

The first line contains a single integer *t*

(1≤*t*≤104

) — the number of test cases.

The first line of each test case contains single integer *n*

(1≤*n*≤105) — the length of array *a*. It is guaranteed that the sum of values of *n* over all test cases in the input does not exceed 105

.

The second line of each test case contains *n*

integers *a*1,*a*2,…,*an* (−109≤*ai*≤109

).

Output

For each test case, print the minimum number of seconds in which you can make *a*

nondecreasing.

Example

Input

Copy

3

4

1 7 6 5

5

1 2 3 4 5

2

0 -4

Output

Copy

2

0

3

Note

In the first test case, if you select indices 3,4

at the 1-st second and 4 at the 2-nd second, then *a* will become [1,7,7,8]. There are some other possible ways to make *a* nondecreasing in 2

seconds, but you can't do it faster.

In the second test case, *a*

is already nondecreasing, so answer is 0

.

In the third test case, if you do nothing at first 2

seconds and select index 2 at the 3-rd second, *a* will become [0,0]

.

。。你真的脑子进水了啊。。修改过程中难道不要把每个数递过来吗。。

然后对于二进制来说，找修改过程中差值最大的那个就行了。。因为其他的数都是小于他的。二进制有的位置是1，有的位置是0罢了。。

你不是前几天还刚开心的看到一道类似的题一下就写了吗。。傻逼。。

你到底怎么了啊。快点振奋起来啊

#include<bits/stdc++.h>

#define ll long long

using namespace std;

ll a[200000];

int main()

{

/\*for(int i=1;i<=31;i++)

{

cout<<biao[i]<<endl;

}

\*/

int t;

scanf("%d",&t);

while(t--)

{

int n; a[0]=-1000000005;

scanf("%d",&n);int pos=0;ll maxx=0;

for(int i=1;i<=n;i++)

{

scanf("%lld",&a[i]);

}

ll ans=0;

for(int i=2;i<=n;i++)

{

if(a[i]<a[i-1])

{

ll now=log2(a[i-1]-a[i]);

a[i]=a[i-1];

ans=max(ans,now+1);

}

}

printf("%lld\n",ans);

}

return 0;

}