(TWO POINTERS + GREEDY) HARD
There are n kangaroos (2e5) with pockets. Each kangaroo has a size (integer number). A kangaroo can go into another kangaroo's pocket if and only if the size (1e5) of kangaroo who hold the kangaroo is at least twice as large as the size of kangaroo who is held.

Each kangaroo can hold at most one kangaroo, and the kangaroo who is held by another kangaroo cannot hold any kangaroos.

The kangaroo who is held by another kangaroo cannot be visible from outside. Please, find a plan of holding kangaroos with the minimal number of kangaroos who is visible.

```
8
2
5
7
6
9
8
4
2
```

output

```
5
```

//
(PRIME FACTORIZATION + MATH) MEDIUM

You are given an array a consisting of n (1e4) positive integers. You can perform the following operation on it:
ai (1e6)

Choose a pair of elements ai and aj (1 ≤i , j≤ n and i≠j);
Choose one of the divisors of the integer ai (ai % x = 0)
Replace ai with (ai / x) and aj with (aj * x)

Determine whether it is possible to make all elements in the array the same
.
example
a = [100,2,50,10,1]

a3 = 50 , a2 = 2 ,x =5; ——————-> a3 = a2 = 10
a1 = 100, a5 =1 , x=10, ——————-> a1 = a5 = 10
//

(GRAPH + DFS) HARD
array contains position of n (2e5) christmas tree all distinct, you want to place m people (2e5) each at distinct place (-2e9 -> 2e9) such that the sum of distances between each person and the nearest tree is minimum

example
2 6 (n m)
1 5 (position of trees)

output
8 (sum of distances between each person and the nearest tree)
-1 2 6 4 0 3 (position of people)

//

(GREEDY) MEDIUM

a robot is walking on from point 0 wants to reach point n (2e5), The robot has a battery and an accumulator with a solar panel. each of those has a maximum capacity a and b (2e5).

The array s denotes which segments are exposed to sunlight: if segment i is exposed, then si=1 , otherwise si=0.

you choose whether the robot pass si using battery or accumulator whatever you choose their capacity decrease by one and you can’t use it if the capacity is zero.

If the current segment is **exposed to sunlight** and the robot goes through it **using the battery**, the charge of the accumulator increases by one (of course, its charge can't become higher than it's maximum capacity).

the maximum number of segments the robot can pass if you control him optimally.

example

5 2 1 (n ,a, b)
0 1 0 1 0
output
5

//

(MATRICES + DP) MEDIUM

You've got an n × m pixel picture. Each pixel can be white or black. Your task is to change the colors of as few pixels as possible to obtain a barcode picture.

A picture is a barcode if the following conditions are fulfilled:

All pixels in each column are of the same color.
The width of each monochrome vertical line is at least x and at most y pixels. In other words, if we group all neighboring columns of the pixels with equal color, the size of each group can not be less than x or greater than y.

6 5 1 2
##.#.
.###.
###..
#...#
.##.#
###..

output
11

//

(STRING + IMPLEMENTATION) EASY
Formally, the girl will like the carpet if it is possible to select four distinct columns in order from left to right such that the first column contains "v", the second one contains "i", the third one contains "k", and the fourth one contains "a".

```
4 4
vkak
iiai
avvk
viaa
4 7
vbickda
vbickda
vbickda
vbickda
```

output
NO
YES

//

(IMPLEMENTATION)EASY

ANTI SUDOKU (do something to ruin this sudoku)

```
1
154873296
386592714
729641835
863725149
975314628
412968357
631457982
598236471
247189563
```

//

(SORTING + GREEDY)EASY

Sasha has an array a of n (1e3) integers. He got bored and for all i, j (i<j), he wrote down the minimum value of ai and aj (-1e9 , 1e9). He obtained a new array b of size n·(n−1)2
For example, if a= [2,3,5,1], he would write
[min(2,3),min(2,5),min(2,1),min(3,5),min(3,1),min(5,1)] = [2,2,1,3,1,1].Then, he randomly shuffled all the elements of the array b Unfortunately, he forgot the array a, and your task is to restore an possible array a from which the array b could have been obtained.

//

(GREEDY + DP)MEDIUM

Given a sequence consisting of n(1e5) integers. The player can make several steps. In a single step he can choose an element of the sequence (let's denote it ak) and delete it, at that all elements equal to ak + 1 and ak - 1 also must be deleted from the sequence. That step brings ak points to the player.
a (1e5)

example
9
1 2 1 3 2 2 2 2 3
2
1 2
output
10
1

//

(DFS) MEDIUM

there’s n (2e5) potions each has a price (1e9) and each one can be contained by mixing other potions, initially you have k potions (2e5), you already own, giving the cost of each potion and the number of potions you own and what potions to mix to have the i th potion determine the minimum cost to have all potions

5 1 (n , k)
30 8 3 5 10 (cost of potions)
3 (the index of potion you already own)
3 2 4 5 (the 1 potion takes 3 other potion to generate the 2nd and 4th and 5th)
0
0
2 3 5
0

//

OOP

///EASY
1 - What are the basic concepts of OOPs?
2 - What is Encapsulation?
3 - What is Abstraction?
4 - What is method overloading?
5 - What is method overriding?
6 - Types of Inheritance in OOPS

/////MEDIUM
1 - Is it possible to call the base class method without creating an instance?

2 - **Types of constructor**

3 - What is a final variable?

4 - What is an exception?

5 - What is a try/ catch block?

6 - What is a finally block?

7 - Can you create an instance of an abstract class?

8 - Differentiate between an abstract class and an interface?

////////////////HARD

1 - What is constructor chaining?

2 - What is Coupling in OOP

3 - What are the types of variables in OOP?(Local ,Static,Instance ,Primitive)

4 - What is the purpose of ‘this’ keyword?

DB

1 - What is the difference between BETWEEN and IN operators in SQL?
2 - Write an SQL query to find the names of employees starting with ‘A’.
3 - What is the difference between CHAR and VARCHAR2 datatype in SQL?
4 - Name different types of case manipulation functions available in SQL. (lower, upper, initcap)
5 - What do you mean by data definition language?(create, drop , alter)
6 - What do you mean by data manipulation language?(insert, delete, Retrieve, update)
7 - What do you mean by foreign key?
8 - What is a primary key?
9 - What is a foreign key?
10 - What is normalization?
11 - What is a Cursor?
12 - Write down various types of relationships in SQL?
13 - What is a subquery?
14 - What is group functions in SQL?
15 - How can you fetch common records from two tables?