A: Small Minimum Cut

Description
You are given a graph corresponding to a road network. Each node in the graph represents a city, and an edge between two cities represents a road between the two cities. You would like there to always be a path between any pair cities, so that important businesspeople can travel between them. Moreover, since roads are subject to failure or construction, sometimes a road can be temporarily unavailable, and you would still like to travel between these cities.

Given a graph, I would like for you to tell me if there is a road such that, if that road is unavailable, there is a pair of cities such that no path exists between them.

Input
On the first line is t, the number of test cases. Then, for each test case, you are given n m, $n < 50$ the number of nodes, $m < 1000$ the number of edges. The next m lines will contain a pair of integers, representing a road between those cities.

Output
For each road network, output "Good" if no such road will disconnect two cities, and output "Bad" otherwise. Note that if the network is initially disconnected, you should output "Bad".

Sample Input
2
3 2
0 1
0 2
3 3
0 1
0 2
1 2

Sample Output
Bad
Good

B:Largest Even Subarray

Description
You are given a sequence of numbers. I would like for you to tell me the maximum value subarray (contiguous subsequence) that contains an even number of entries. (zero is an even number!)

Input
On the first line is t, the number of test cases. Then, for each test case, you are given $n < 10^6$, the size of the array. Then, n integers follow.

Output
For each array, output the maximum value subarray that contains an even number of entries.

Sample Input
2
3
1 2 3
2
1 -2

Sample Output
5
0

C:Bowl of Candy

Description
You have a bowl of candy. There is lots of candy in there, and rather than make yourself sick, you will sit and ponder about the candy. You wonder: if you always eat an odd number of candies at once, how many possible ways there are to eat the candies.

Input
On the first line is t, the number of test cases. Then, for each test case, you are given $n < 10^7$, the number of candies.

Output
For each amount of candies, output the number of ways to eat that many candies. Since this number may be very large, output it module 10^6.

Sample Input
2
2
5

Sample Output
1
5

D:Smallest Bounding Square

Description
You are given the coordinates of some trees in a field, and you would like to build an axis-aligned fence around them. (parallel to x-axis and y-axis) You were raised that rectangle fences were an abomination due to their suboptimal area to perimeter ratio, and so you would like this fence to be square. I want to know the smallest size square fence I can build such that all the trees are inside it.

Input
On the first line is t, the number of test cases. Then, for each test case, you are given $n < 10^3$, the number of trees. Then, on the next n lines, there are two integers denoting the position of that tree. You may assume all positions are less than 10^3 in magnitude.

Output
For each set of trees, output the area of the smallest size square fence you can build.

Sample Input
2
2
1 1
-1 -1
2
0 0
0 1

Sample Output
4
1

E:2-colorability

Description
You are given a graph, and you would like to determine if it is 2-colorable. That is, you can color each node either red or blue such that no two red nodes are adjacent and no two blue nodes are adjacent.

Input
On the first line is t, the number of test cases. Then, for each test case, you are given n m, $n < 10^3$ the number of nodes, $m < 10^5$ the number of edges. The next m lines will contain a pair of integers, representing an edge between those nodes.

Output
For each test case, output "Yes" if it is 2-colorable, and "No" otherwise.

Sample Input
2
2 1
0 1
3 3
0 1
0 2
1 2

Sample Output
Yes
No

F:Candy Fight

Description
You are fighting with a friend over a bowl of candy. You decide to settle the fight by taking turns selecting pieces. Each piece of candy has a size. What is the largest total size of candy you are guaranteed to receive if you play optimally?

Input
On the first line is t, the number of test cases. Then, for each test case, you are given $n < 10^5$, the number of candies. Then, n positive integers less than 10^3 follow representing the sizes of each piece of candy.

Output
For each test case, output the largest amount of candy you are guaranteed to get if you play optimally.

Sample Input
2
2
1 3
3
2 4 5

Sample Output
3
7

G: Prime Range

Description
Given two numbers, I would like for you to tell me the number of primes between them.
Input
On the first line is t, the number of test cases. Then, for each test case, you are given two integers x and y, $x, y < 10^6$.
Output
For each pair of numbers, output the number of primes p such that $x < p \leq y$.
Sample Input
2
2 3
5 11

Sample Output
1
2

H: Do This One First

Description
Given two numbers, I would like for you to tell me which one is bigger.
Input
On the first line is t, the number of test cases. Then, for each test case, you are given two integers x and y, $x, y < 10^6$.
Output
For each pair of numbers, output the bigger of the two numbers.
Sample Input
2
2 3
5 11

Sample Output
3
11

I: Average Length

Description
Given a list of strings, please output the average length of the strings.
Input
You will be given a number t, the number of strings. Then, t strings of alphanumeric characters follow, no longer than 100 characters, one per line.
Output
Output the average length of the strings, to 2 decimal places of accuracy.
Sample Input
2
asdf
Hello123

Sample Output
2.00

J: Squared Distance

Description
Given a sequnce of numbers, I would like for you to order the numbers in such a way that minimizes the sum of the squared distances between consecutive entries. For instance, for the numbers $1, 5, 3$, if you order them as $1, 3, 5$, the sum of the squared distances is $4 + 4 = 8$, which is minimal.
Input
You will be given a number t, $t < 10^5$, the number of integers. Then, t integers follow, where each integers is at most size $1,000$.
Output
Output the minimal sum of the squared distances over all orderings of the integers.
Sample Input
4
1 7 3 4

Sample Output
9