1. Watermelon

One hot summer day Pete and his friend Billy decided to buy a watermelon. They chose the biggest and the ripest one, in their opinion. After that the watermelon was weighed, and the scales showed w kilos. They rushed home, dying of thirst, and decided to divide the berry, however they faced a hard problem. Pete and Billy are great fans of even numbers, that's why they want to divide the watermelon in such a way that each of the two parts weighs even number of kilos, at the same time it is not obligatory that the parts are equal. The boys are extremely tired and want to start their meal as soon as possible, that's why you should help them and find out, if they can divide the watermelon in the way they want. For sure, each of them should get a part of positive weight.

2. Way Too Long Words

Sometimes some words like "localization" or "internationalization" are so long that writing them many times in one text is quite tiresome. Let's consider a word too long, if its length is strictly more than 10 characters. All too long words should be replaced with a special abbreviation. This abbreviation is made like this: we write down the first and the last letter of a word and between them we write the number of letters between the first and the last letters. That number is in decimal system and doesn't contain any leading zeroes. Thus, "localization" will be spelt as "l10n", and "internationalization» will be spelt as "i18n". You are suggested to automatize the process of changing the words with abbreviations. At that all too long words should be replaced by the abbreviation and the words that are not too long should not undergo any changes.

3. Theatre Square

Theatre Square in the capital city of Berland has a rectangular shape with the size $n \times m$ meters. On the occasion of the city's anniversary, a decision was taken to pave the Square with square granite flagstones. Each flagstone is of the size $a \times a$. What is the least number of flagstones needed to pave the Square? It's allowed to cover the surface larger than the Theatre Square, but the Square has to be covered. It's not allowed to break the flagstones. The sides of flagstones should be parallel to the sides of the Square.

4. Team

One day three best friends Petya, Vasya and Tonya decided to form a team and take part in programming contests. Participants are usually offered several problems during programming contests. Long before the start the friends decided that they will implement a problem if at least two of them are sure about the solution. Otherwise, the friends won't write the problem's solution. This contest offers n problems to the participants. For each problem we know, which friend is sure about the solution. Help the friends find the number of problems for which they will write a solution.

5. Next Round

"Contestant who earns a score equal to or greater than the k-th place finisher's score will advance to the next round, as long as the contestant earns a positive score..." — an excerpt from contest rules. A total of n participants took part in the contest (n≥k), and you already know their scores. Calculate how many participants will advance to the next round.

6. String Task

Petya started to attend programming lessons. On the first lesson his task was to write a simple program. The program was supposed to do the following: in the given string, consisting if uppercase and lowercase Latin letters, it: Vowels are letters "A", "O", "Y", "E", "U", "I", and the rest are consonants. The program's input is exactly one string, it should return the output as a single string, resulting after the program's processing the initial string. Help Petya cope with this easy task.

7. Domino piling

You are given a rectangular board of M×N squares. Also you are given an unlimited number of standard domino pieces of 2×1 squares. You are allowed to rotate the pieces. You are asked to place as many dominoes as possible on the board so as to meet the following conditions: 1. Each domino completely covers two squares. 2. No two dominoes overlap. 3. Each domino lies entirely inside the board. It is allowed to touch the edges of the board. Find the maximum number of dominoes, which can be placed under these restrictions.

8. Bit++

The classic programming language of Bitland is Bit++. This language is so peculiar and complicated. The language is that peculiar as it has exactly one variable, called x. Also, there are two operations: A statement in language Bit++ is a sequence, consisting of exactly one operation and one variable x. The statement is written without spaces, that is, it can only contain characters "+", "-", "X". Executing a statement means applying the operation it contains. A programme in Bit++ is a sequence of statements, each of them needs to be executed. Executing a programme means executing all the statements it contains. You're given a programme in language Bit++. The initial value of x is 0. Execute the programme and find its final value (the value of the variable when this programme is executed).

9. Petya and Strings

Little Petya loves presents. His mum bought him two strings of the same size for his birthday. The strings consist of uppercase and lowercase Latin letters. Now Petya wants to compare those two strings lexicographically. The letters' case does not matter, that is an uppercase letter is considered equivalent to the corresponding lowercase letter. Help Petya perform the comparison.

10. Beautiful Matrix

You've got a 5×5 matrix, consisting of 24 zeroes and a single number one. Let's index the matrix rows by numbers from 1 to 5 from top to bottom, let's index the matrix columns by numbers from 1 to 5 from left to right. In one move, you are allowed to apply one of the two following transformations to the matrix: You think that a matrix looks beautiful, if the single number one of the matrix is located in its middle (in the cell that is on the intersection of the third row and the third column). Count the minimum number of moves needed to make the matrix beautiful.

11. Helpful Maths

Xenia the beginner mathematician is a third year student at elementary school. She is now learning the addition operation. The teacher has written down the sum of multiple numbers. Pupils should calculate the sum. To make the calculation easier, the sum only contains numbers 1, 2 and 3. Still, that isn't enough for Xenia. She is only beginning to count, so she can calculate a sum only if the summands follow in non-decreasing order. For example, she can't calculate sum 1+3+2+1 but she can calculate sums 1+1+2 and 3+3. You've got the sum that was written on the board. Rearrange the summans and print the sum in such a way that Xenia can calculate the sum.

12. Word Capitalization

Capitalization is writing a word with its first letter as a capital letter. Your task is to capitalize the given word. Note, that during capitalization all the letters except the first one remains unchanged.

13. Stones on the Table

There are n stones on the table in a row, each of them can be red, green or blue. Count the minimum number of stones to take from the table so that any two neighboring stones had different colors. Stones in a row are considered neighboring if there are no other stones between them.

14. Football

Petya loves football very much. One day, as he was watching a football match, he was writing the players' current positions on a piece of paper. To simplify the situation he depicted it as a string consisting of zeroes and ones. A zero corresponds to players of one team; a one corresponds to players of another team. If there are at least 7 players of some team standing one after another, then the situation is considered dangerous. For example, the situation 001001101111111101 is dangerous and 11110111011101 is not. You are given the current situation. Determine whether it is dangerous or not.

15. Boy or Girl

Those days, many boys use beautiful girls' photos as avatars in forums. So it is pretty hard to tell the gender of a user at the first glance. Last year, our hero went to a forum and had a nice chat with a beauty (he thought so). After that they talked very often and eventually they became a couple in the network. But yesterday, he came to see "her" in the real world and found out "she" is actually a very strong man! Our hero is very sad and he is too tired to love again now. So he came up with a way to recognize users' genders by their user names. This is his method: if the number of distinct characters in one's user name is odd, then he is a male, otherwise she is a female. You are given the string that denotes the user name, please help our hero to determine the gender of this user by his method.

16. Young Physicist

A guy named Vasya attends the final grade of a high school. One day Vasya decided to watch a match of his favorite hockey team. And, as the boy loves hockey very much, even more than physics, he forgot to do the homework. Specifically, he forgot to complete his physics tasks. Next day the teacher got very angry at Vasya and decided to teach him a lesson. He gave the lazy student a seemingly easy task: You are given an idle body in space and the forces that affect it. The body can be considered as a material point with coordinates (0; 0; 0). Vasya had only to answer whether it is in equilibrium. "Piece of cake" — thought Vasya, we need only to check if the sum of all vectors is equal to 0. So, Vasya began to solve the problem. But later it turned out that there can be lots and lots of these forces, and Vasya can not cope without your help. Help him. Write a program that determines whether a body is idle or is moving by the given vectors of forces.

17. Soldier and Bananas

A soldier wants to buy w bananas in the shop. He has to pay k dollars for the first banana, 2k dollars for the second one and so on (in other words, he has to pay i·k dollars for the i-th banana). He has n dollars. How many dollars does he have to borrow from his friend soldier to buy w bananas?

18. Bear and Big Brother

Bear Limak wants to become the largest of bears, or at least to become larger than his brother Bob. Right now, Limak and Bob weigh a and b respectively. It's guaranteed that Limak's weight is smaller than or equal to his brother's weight. Limak eats a lot and his weight is tripled after every year, while Bob's weight is doubled after every year. After how many full years will Limak become strictly larger (strictly heavier) than Bob?

19. Chat room

Vasya has recently learned to type and log on to the Internet. He immediately entered a chat room and decided to say hello to everybody. Vasya typed the word s. It is considered that Vasya managed to say hello if several letters can be deleted from the typed word so that it resulted in the word "hello". For example, if Vasya types the word "ahhellllloou", it will be considered that he said hello, and if he types "hlelo", it will be considered that Vasya got misunderstood and he didn't manage to say hello. Determine whether Vasya managed to say hello by the given word s.

20. Tram

Linear Kingdom has exactly one tram line. It has n stops, numbered from 1 to n in the order of tram's movement. At the i-th stop ai passengers exit the tram, while bi passengers enter it. The tram is empty before it arrives at the first stop. Also, when the tram arrives at the last stop, all passengers exit so that it becomes empty. Your task is to calculate the tram's minimum capacity such that the number of people inside the tram at any time never exceeds this capacity. Note that at each stop all exiting passengers exit before any entering passenger enters the tram.

21. Lucky Division

Petya loves lucky numbers. Everybody knows that lucky numbers are positive integers whose decimal representation contains only the lucky digits 4 and 7. For example, numbers 47, 744, 4 are lucky and 5, 17, 467 are not. Petya calls a number almost lucky if it could be evenly divided by some lucky number. Help him find out if the given number n is almost lucky.

22. Wrong Subtraction

Little girl Tanya is learning how to decrease a number by one, but she does it wrong with a number consisting of two or more digits. Tanya subtracts one from a number by the following algorithm: You are given an integer number n. Tanya will subtract one from it k times. Your task is to print the result after all k subtractions. It is guaranteed that the result will be positive integer number.

23. Elephant

An elephant decided to visit his friend. It turned out that the elephant's house is located at point 0 and his friend's house is located at point x(x>0) of the coordinate line. In one step the elephant can move 1, 2, 3, 4 or 5 positions forward. Determine, what is the minimum number of steps he need to make in order to get to his friend's house.

24. Twins

Imagine that you have a twin brother or sister. Having another person that looks exactly like you seems very unusual. It's hard to say if having something of an alter ego is good or bad. And if you do have a twin, then you very well know what it's like. Now let's imagine a typical morning in your family. You haven't woken up yet, and Mom is already going to work. She

has been so hasty that she has nearly forgotten to leave the two of her darling children some money to buy lunches in the school cafeteria. She fished in the purse and found some number of coins, or to be exact, n coins of arbitrary values $a_1, a_2, ..., a_n$. But as Mom was running out of time, she didn't split the coins for you two. So she scribbled a note asking you to split the money equally. As you woke up, you found Mom's coins and read her note. "But why split the money equally?" — you thought. After all, your twin is sleeping and he won't know anything. So you decided to act like that: pick for yourself some subset of coins so that the sum of values of your coins is strictly larger than the sum of values of the remaining coins that your twin will have. However, you correctly thought that if you take too many coins, the twin will suspect the deception. So, you've decided to stick to the following strategy to avoid suspicions: you take the minimum number of coins, whose sum of values is strictly more than the sum of values of the remaining coins. On this basis, determine what minimum number of coins you need to take to divide them in the described manner.

25.B. Queue at the School

During the break the schoolchildren, boys and girls, formed a queue of n people in the canteen. Initially the children stood in the order they entered the canteen. However, after a while the boys started feeling awkward for standing in front of the girls in the queue and they started letting the girls move forward each second. Let's describe the process more precisely. Let's say that the positions in the queue are sequentially numbered by integers from 1 to n, at that the person in the position number 1 is served first. Then, if at time x a boy stands on the i-th position and a girl stands on the $(i+1)$-th position, then at time $x+1$ the i-th position will have a girl and the $(i+1)$-th position will have a boy. The time is given in seconds. You've got the initial position of the children, at the initial moment of time. Determine the way the queue is going to look after t seconds.

26. Nearly Lucky Number

Petya loves lucky numbers. We all know that lucky numbers are the positive integers whose decimal representations contain only the lucky digits 4 and 7. For example, numbers 47, 744, 4 are lucky and 5, 17, 467 are not. Unfortunately, not all numbers are lucky. Petya calls a number nearly lucky if the number of lucky digits in it is a lucky number. He wonders whether number n is a nearly lucky number.

27. Word

Vasya is very upset that many people on the Net mix uppercase and lowercase letters in one word. That's why he decided to invent an extension for his favorite browser that would

change the letters' register in every word so that it either only consisted of lowercase letters or, vice versa, only of uppercase ones. At that as little as possible letters should be changed in the word. For example, the word HoUse must be replaced with house, and the word ViP — with VIP. If a word contains an equal number of uppercase and lowercase letters, you should replace all the letters with lowercase ones. For example, maTRIx should be replaced by matrix. Your task is to use the given method on one given word.

28. Translation

The translation from the Berland language into the Birland language is not an easy task. Those languages are very similar: a berlandish word differs from a birlandish word with the same meaning a little: it is spelled (and pronounced) reversely. For example, a Berlandish word code corresponds to a Birlandish word edoc. However, it's easy to make a mistake during the «translation». Vasya translated word s from Berlandish into Birlandish as t. Help him: find out if he translated the word correctly.