Against-time

1600, November 5, 2021, to 1800, November 5, 2021
(2 hours | 5 Problems)

1. Rules:

- This is an Individual Contest. No team submissions are allowed. Answer as many problems as you can.
- Common Loopholes are forbidden, by default.
- Use of built-in libraries is allowed, provided CodeChef supports the libraries and that, they do not violate Rule 2, above.
- You can make up to 5 submissions, the score for the best one will be considered for the ranking.
- You are allowed to access your language documentation.
- You will get 5*(passed test)/(total tests) points for every submitted question.
- In case of a tie, the submission which clears the tests faster wins (run time, not complexity).
- No negative marking.
- If you submit before time then for every 10 minutes left to 1800hrs you will get 1 extra point.
- The form will be open till midnight, but for every 1 minute after 1800 hrs, you will lose 1 point.

2. Problems:

Problem 1 (The power of 4)

Karan likes the number 4 very much. Impressed by the power of this number, Karan has begun to look for occurrences of four

anywhere. He has a list of T integers, for each of them he wants to calculate the number of occurrences of the digit 4 in the decimal representation. He is too busy now, so please help him.

Input

The first line of input consists of a single integer T, denoting the number of integers in Karan's list. Then, there are T lines, each of which contains a single integer from the list.

Output

Output T lines. Each of these lines should contain the number of occurrences of the digit 4 in the respective integer from Karan's list.

Constraints

- 1 ≤ T ≤ 10^5

Example

Input:
5
447474
228
6664
40
81

Output:
4
0
1
1
0

Problem 2 (Gross salary)

In a company, an employee is paid as under. If his basic salary is less than Rs. 1500, then HRA = 10% of base salary and DA = 90% of basic salary.

If his salary is either equal to or above Rs. 1500, then HRA = Rs. 500 and DA = 98% of basic salary. If the Employee's salary is input, write a program to find his gross salary.

NOTE: Gross Salary = Basic Salary + HRA + DA

Input

The first line contains an integer T, the total number of test cases. Then follow T lines, each line contains an integer salary.

Output

For each test case, output the gross salary of the employee in a new line. Your answer will be considered correct if the absolute error is less than 10^{-2}.

Constraints

- 1 ≤ T ≤ 1000
- 1 ≤ salary ≤ 100000

Example

Input
3
1203
10042
1312

Output
2406.00
20383.16
2624

Problem 3 (Akhil's colored balls)

Akhil has many balls of white and black colors. One day, he was playing with them. During the play, he arranged the balls into two rows both consisting of **N** number of balls. These two rows of balls are given to you in the form of strings **X, Y**. Both these strings consist of 'W' and 'B', where 'W' denotes a white-colored ball and 'B' is a black color ball.

Other than these two rows of balls, Akhil has an infinite supply of extra balls of each color. he wants to create another row of **N** balls, **Z** in such a way that the sum of Hamming distance between **X** and **Z**, and hamming distance between **Y** and **Z** is maximized.

Hamming Distance between two strings **X** and **Y** is defined as the number of positions where the color of balls in row **X** differs from the row **Y** ball at that position. e.g. Hamming distance between "WBB", "BWB" is 2, as, at positions 1 and 2, corresponding colors in the two strings differ.

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As there can be multiple such arrangements of row **Z**, Akhil wants you to find the lexicographically smallest arrangement which will maximize the above value.

Input

- The first line of the input contains an integer **T** denoting the number of test cases. The description of **T** test cases follows:
- The first line of each test case will contain a string **X** denoting the arrangement of balls in the first row

- Second-line will contain the string **Y** denoting the arrangement of balls in the second row.

Output

- For each test case, output a single line containing the string of length **N** denoting the arrangement of colors of the balls belonging to row **Z**.

Constraints

- **1** ≤ **T** ≤ **3**

Example

Input:
1
WBWB
WBBB

Output:
BWBW

Explanation

Example case 1. As we know, Hamming Distance(WBWB, BWBW) + Hamming Distance(WBBB, BWBW) = 4 + 3 = 7.

You can try any other value for string **Z**, it will never exceed 6

Problem 4 (Run like you mean it)

Vishal loves running. He often visits his favorite Nehru Park and runs for very long distances. On one such visit, he found that the number of girls in the park was unusually high. Now he wants to use this as an opportunity to impress a large number of girls with his awesome speed.

The track on which he runs is an N kilometers long straight path. There are a_i girls standing within the ith kilometer of this path. A girl will be impressed only if Vishal is running at his maximum speed when he passes by her. But he can run at his best speed only for a single continuous stretch of K kilometers. Now Vishal wants to know what is the maximum number of girls that he can impress.

Input

The first line of the input contains the number of test cases T.

For each test case, the first line contains two space-separated integers N and K, the length of the track, and the maximum distance he can run at his best speed.

Second-line contains N space-separated integers, the number of girls within each kilometer of the track.

Output

For each test case print one line containing an integer, denoting the maximum number of girls Vishal can impress.

Constraints

$1 \leq T \leq 10$

$1 \leq K \leq N \leq 100$

$1 \leq a_i \leq 100$

Example

Sample Input

```
1
7 2
2 4 8 1 2 1 8
```

Sample Output

12

Explanation

He can impress 4+8=12 girls if he runs at his best speed between the 2nd and the 3rd kilometer, inclusive.

Problem 5 (Covid or not?)

Covid-19 is spreading fast! There are N cities, numbered from 0 To $(N-1)$, arranged in a circular manner. City 0 is connected to city 1, 1 to 2, …, city $(N-2)$ to city $(N-1)$, and city $(N-1)$ to city 0. The virus is currently in city X. Each day, it jumps from its current city to the city K to its right, i.e., from city X to the city $(X+K)\%N$. As the virus jumps, the cities in-between don't get infected. Cities once infected stay infected. You live in city Y . **Find if it will reach your city eventually.** If it will, print **YES**, else print **NO**.

Input

The first line of the input consists of an integer T, the number of test cases. The first and only line of each test case contains four space-separated integers - N, K, X, and Y, denoting the number of cities, the size of jumps, Covid's current city, and the city that you live in, respectively.

Output

For each test case, in a new line, print **YES** if Covid shall reach your city after a finite number of days, else print **NO**.

Constraints

- $1 \leq T \leq 100$
- $1 \leq N \leq 1000$
- $0 \leq X, Y \leq N-1$
- $0 \leq K \leq 1000$

Sample Input 1

```
 2
6 2 5 3
12 3 4 2
```

Sample Output 1

```
YES
NO
```

Explanation

- In the **first sample**, Covid starts at city 5, then goes to city 1, and then from city 1 to city 3 . Thus, it reaches the city that you live in.
- In the **second sample**, Covid starts at city 4, goes to city 7, then 10, 1, then 4, 7,10, …, and so on. It never reaches city 2

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3. Submit here:

https://docs.google.com/forms/d/e/1FAIpQLSd-AVZh6zqxgA7dIWPvHOAml6tTDsfwQK6p0uyn7M7OhUJ2mg/viewform?usp=sf_link