Computer Programming Assignment

Instructions: For all the questions you can assume that testing will be done within the limits of memory and within the limits of the data type specified. You can therefore assume that inputs will not be really huge that the system will run out of memory or if a question needs you to store the output say as a double, we will use inputs so the output can indeed be stored as a double.

a) Given N integers and an integer K, please identify whether any subset of the set of N numbers add up to K.

Input

The first line will contain two integers N and K.

The second line will contain N integers (separate by space) denoting the set of integers.

Output

Print Yes if there exists any subset with sum equal to K, else print No

If Yes, print the subset of numbers in a new line

b) Given an array, please find all those subarrays [i.e. contiguous elements of the array from left to right], where the elements in subarray occur exactly once. Find the summation of the lengths of all such subarrays. You can assume that all the elements are of value 0 to 9.

Input

First line consists of an integer N, denoting the size of the array.

Second line consists of N space separated integers, a0 a1 ... aN-1.

Output

The value of sum

Sample Input

5

1 2 3 4 5

Sample Output

35

c) Your are given an array of length N, and N integers of the array a1 ... an. There are Q update queries performed on the array. Each query is of the form: i j k, implying that you have to add number k to all the array indices from i till j. Write a program to print the final array produced after all the queries have been performed on the array.

Input

First line contains N, Q i.e., size of the array and number of queries to be performed on the array.

Second line gives the N elements of the array.

Q lines follow, each line having three variables i, j and k.

Output

A single line containing the final updated array after performing all the queries.

d) Write a program to calculate ((X^Y) %M) using for loops [X^Y is read as X power Y]

Input

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

Then T lines follow, each line having three variables X, Y and M.

Output

Output a single line containing the T numbers computed (separated by spaces).

Sample Input

1

2 5 100

Sample Output

32

e) You are sitting for an exam and have to score at least V marks in total to pass the exam. There are N questions in total and each of them takes the same time to attempt (assume that you will always get a question correct if you attempt it). Question i gives score Ai. Output the minimum number of questions you need to attempt to pass the exam, followed by a ":" and then the question numbers that need to be answered.

Input

First line contains T, the number of test cases.

For each test case, the first line contains 2 positive integers N V.

The next line contains N scores A1 A2 ... AN

Output

Output the answer for each test case separated by a new line.

Sample Input

1

4 6

1 4 1 3

Sample Output

2 : 2 4

f) You are given a number N, print the factorial of N.

Input

First line contains T, the number of test cases.

For each test case in a newline, the test case contains a positive integer N.

Output

Output the factorial for each test case. Each output should be separated by a new line.

Sample Input

2

6

25

Sample Output

720

155112100433309859840000000

g) Write a program which takes the marks (as integers) of n students and outputs their mean, median and mode. Assume n is an odd number and mode is unique. Mean must be rounded down to an integer (see floor function).

Input

First line of input contains the number of students n.

Next line contains n space separated integers M1 M2 ... Mn i.e., marks of the students.

Output

The output must be a single line (ending with a newline character) containing 3 space separated integers - mean, median and mode of the given marks.

Sample Input

9

5 2 6 4 1 3 6 8 9

Sample Output

4 5 6

h) There is an array of n integers. Every integer present in that array occurs exactly k times in the array. A new integer is then inserted into the array at a random position. Your task is to find that integer.

Input

First line of input contains two space separated integers n and k

Next line contains n + 1 space separated integers: a1 a2 ... an+1 (the elements of the modified array).

Output

Output is a single integer - the newly inserted number, followed by a newline.

Sample Input

4 2

13 2 7 13 7

Sample Output

2

i) Given two integers n and m, find the sum of all the prime numbers between n and m with n and m included (if they are prime).

Input

First line contains T, the number of test cases.

Each test case contains two space separated integers n and m.

Output

Corresponding to each test case, print the answer, followed by a new line.

Sample Input

5
0 10
3 5
11 25
21123 453254
999998 999999

Sample Output

17
8
83
8183129942
0

Explanation

For the first test case, the prime numbers between 0 and 10 are 2, 3, 5, and 7. Hence the sum is 17.