Red.Digital Digi-Thor Programming Contest 2020

Robi Axiata Ltd.

https://toph.co/c/reddotdigital-digi-thor-2020

Toph

Schedule

The contest will run for **3h0m0s**.

Rules

This contest is formatted as per the official rules of ICPC Regional Programming Contests.

You can use Bash 5.0, Brainf*ck, C# Mono 6.0, C++11 GCC 7.4, C++14 GCC 8.3, C++17 GCC 9.2, C11 GCC 9.2, Common Lisp SBCL 2.0, Erlang 22.3, Free Pascal 3.0, Go 1.13, Haskell 8.6, Java 1.8, Kotlin 1.1, Node.js 10.16, Perl 5.30, PHP 7.2, PyPy 7.1 (2.7), PyPy 7.1 (3.6), Python 2.7, Python 3.7, Python 3.8, Ruby 2.6, Swift 5.3, and Whitespace in this contest.

Be fair, be honest. Plagiarism will result in disqualification. Judges' decisions will be final.

Notes

There are 8 challenges in this contest.

Please make sure this booklet contains all of the pages.

If you find any discrepencies between the printed copy and the problem statements in Toph Arena, please rely on the later.

A. Welcome to Digi-Thor

Robi Axiata Limited is one of the largest telecom company in Bangladesh. They are supporting Bangladesh to advance digitalization of Bangladesh by offering cutting edge technology. You work for them as a programmer. Recently they start Red.Digital Digi-Thor Programming Contest to grow young talent. Your job is to welcome everyone who participate in this contest.

Input

Program will not have any input.

Output

Write a program that output “Welcome to Red.Digital Digi-Thor Programming Contest!” in one line.

As example,

```
// C/C++
#include<stdio.h>

int main() {
    printf("Welcome to Red.Digital Digi-Thor Programming Contest\n");
    return 0;
}

// Java
import java.io.*;
import java.util.*;

public class Main {
  public static void main(String[] args) {
    System.out.println("Welcome to Red.Digital Digi-Thor Programming Contest");
  }
}

# python
print("Welcome to Red.Digital Digi-Thor Programming Contest")

// Go
package main

import "fmt"

func main() {
        fmt.Println("Welcome to Red.Digital Digi-Thor Programming Contest")
}
```

B. Summer Olympic

The Summer Olympic Games also known as the Games of the Olympiad, are a major international multi-sport event normally held once every four years. Last five Summer Olympic has been held in 2016, 2012, 2008, 2004 and 2000.

2020 Summer Olympic was scheduled to be held in July, 2020 in Tokyo, Japan. But due to the Covid-19 pandemic, this event has been rescheduled to July, 2021. Although, it will be held in 2021, the name of the event will remain 2020 Summer Olympic and so that it won't impact on the schedule of the other Summer Olympic games.

You will be given a year ***Y***. You will have to output how many olympic will be held from 2021 to ***Y***?

Input

First line contains an integer ***T***, denotes the number of testcases. Then, each of the next ***T*** lines contain an integer ***Y***

Constraints:

- $1 \leq T \leq 80$
- $2021 \leq Y \leq 2100$

Output

For each test case, print the number of olympic will be held in a separate line.

Samples

Input	Output
1 2022	1

C. Forward/Backward Moving

Given an array **A** of **n** integers you will have to do circulate operations on the array. On right circulate operation if an array is **a[0], a[1], …., a[n – 1]**, then after one right circular shift the array will become **a[n – 1], a[0], a[1], …., a[n – 2]**. On left circulate operation if the array is **a[0], a[1], …., a[n – 1]**, then after one left circular shift the array will become **a[1], …., a[n – 2], a[n – 1], a[0]**.

You will be given two integers **x** and **y**. If **y** is **1** you will have to right circulate the array **x** times. Otherwise, if **y** is **0** you will have to left circulate the array **x** times.

Input

On the first line of the input file there will be three integers **n(1 <= n <= 100)**, **x(1 <= x <= 100)** and **y(0 <= 1)**. On the second line of the input there will be **n** integers representing the values of the array **a(1 <= a[i] <= 100)**.

Output

Print the updated values of the array on a single line separated by a single space.

Samples

Input	Output
5 6 1 5 6 4 2 3	3 5 6 4 2

Input	Output
5 3 0 5 7 8 4 6	4 6 5 7 8

D. Alphabet Keyboard

Abir got a computer from his father as birthday gift. He never used computer before. When he saw the keyboard, he got confused. Alphabets are not in order. He asked his father and his father told it's called QWERTY keyboard.

Typing in QWERTY keyboard was difficult for Abir. So he opened all 26 key caps of keyboard and arrange in alphabet order. Now, he can find character easily. But he tape 'a', 'q' is written in document. Also, if he tape 'b', 'w' is written and so on.

Abir's Keyboard Button	Character Written in Document	Abir's Keyboard Button	Character Written in Document
a	q	n	f
b	w	o	g
c	e	p	h
d	r	q	j
e	t	r	k
f	y	s	l
g	u	t	z
h	i	u	x
i	o	v	c
j	p	w	v
k	a	x	b

Abir's Keyboard Button	Character Written in Document	Abir's Keyboard Button	Character Written in Document
l	s	y	n
m	d	z	m

You are his programmer friend. He ask for your help to write a program. Abir will give you a string that he typed using his keyboard, you have to output correct string. As example, Abir tried to type “hello” but he got “itssg” when he typed. He will give you “itssg”, you will output “hello”.

Input

Each file will have a string in one line consists of lower case letters and space. String length will be less than or equal to 100.

Output

Output the string Abir wanted to write in one line.

Samples

Input	Output
`itssg vgksr`	`hello world`

Input	Output
`o sgct egdhxztk leotfet`	`i love computer science`

E. Fix & Reverse

Given an array of **n** integers you will have to reverse the elements of the array without changing the position of **x** th element.

Input

The first line of input contains an integer **T(1 <= T <= 20)** the number of test cases to follow. Each test case contains two lines of input. On the first line of each test case there will be two integers **n(1 <= n <= 100**), **x(1 <= x <= n)**. On the second line there will be n integers representing the values of the array **a(1 <= a[i] <= 100)**.

Output

For each test case print the updated values of the array on a single line separated by a single space.

Samples

Input	Output
2 5 1 5 6 4 2 3 5 2 1 6 4 2 3	5 3 2 4 6 3 6 2 4 1

The first line of the input contains the number of tests cases. So we have 2 test cases in this input.

For the first case the array length is 5 and we shouldn't change the position of the 1'st element whose value is 5. So the rest of the array [6, 4, 2, 3] becomes [3, 2, 4, 6] after reversing. So finally the answer for this case is [5, 3, 2, 4, 6].

For the second case the array length is 5 and we shouldn't change the position of the 2'nd element whose value is 6. So the rest of the array [1, 4, 2, 3] becomes [3, 2, 4, 1] after reversing. So finally the answer for this case is [3, 6, 2, 4, 1].

F. Ananta Alom Music School

Once upon a time, there was a singer(!) named Hero Alom who was very popular in the kingdom of King AJ. King AJ was a big fan of Mr. Alom and requested him to start a music school for his people. Mr. Alam was very active in social work, so he started the school of music in a very remote place of the kingdom called Ananta Alom Music School.

Mr. Alom had implemented a strange rule in his school. Every student must learn one new lesson every day than the previous day. After each day, the number of lessons learned is added to the student's mark sheet. That means on the first day, the students learn one lesson, and the next day, he has to learn another lesson. So after the second-day students have a total mark of 3 (1 + 2). But there is an exception to the rule, the 5th day is the holiday and on the 6th day, the student has to learn two lessons. So a student's mark sheet looks like **1+2+3+4+0+6+7+8+9+0+11** … and so on. Note that, on the holiday, there is no entry on the mark sheet.

Now, we have a huge number of mark sheets of that school from an ancient place. Your job is to efficiently calculate the marks of a student by only knowing the duration of a student's school life.

Input

The input starts with a number **T** that denotes the number of students. Then there are **T** lines containing the number of days **d**, which denotes how many days a student studied in that school.

1 <= T <= 10^3

1 <= d <= 10^7

Output

There will be **T** lines in the output containing the total mark of each student. See sample output for the exact format.

Samples

Input	Output
4 3 5 11 9999997	Case 1: 6 Case 2: 10 Case 3: 51 Case 4: 39999980000003

G. Bracket Sub Sequence

Given a bracket sequence which only contains opening and ending of first bracket ‘(’ and ‘)’.

A bracket sequence is called balanced if it follows three rules,
1. Empty sequence is a balanced bracket sequence
2. If S is a balanced bracket sequence then (S) is also a balanced bracket sequence.
3. If S and T are balanced bracket sequences then ST is also balanced bracket sequence. (By ST we mean concatenation of S and T)

For example **()(()())** is a balanced bracket sequence where **())(** is not.

Now given a bracket sequence (not necessarily balanced), you need to make it balanced but you have only one operation, you can remove a consecutive subsequence from the bracket sequence. And you can use this operation only once or zero times. Can you find the maximum length of balanced bracket sequence after the operation?

Input

The first line of the input contains a single integer $t(1 \leq t \leq 10)$ denoting the number of test cases. The description of t test cases follows.

The first and only line of each test case contains the sequence as a string of first brackets ‘(’ and/or ‘)’, maximum length of the string can be $2 * 10^5$.

Output

For each test case, print a single line containing the maximum length of the resulting balanced sequence.

Samples

Input	Output
3 ()(()) ()(()))()))))))(((((()()	6 8 4

Input	Output
For the first test case no need to remove any substring, *For the second test case we can remove ()(()) **))** () these two bold brackets, so the answer is 8.* *For the third test case we need to remove all the first brackets except last four, that makes the answer to 4.*	

H. Transforming String

You will be given a string of characters between ‘a’ to ‘j’ and a list of ***M*** pair of characters, u and v. You can perform the following operation.

- First you have to choose a pair of characters, u and v from the given list. Then, you can replace a character u in the given string with v. After the replacement the new string will be your given string.

You have to output whether you can rearrange the characters in the given string in non-decreasing order by performing this operation any number of times.

Input

First line contains an integer ***T*** denotes the number of test cases. Each test case starts with a string of length ***N***. Following line contains an integer ***M*** denotes the number of pairs of characters. Each of the following ***M*** lines contain two characters u and v.

Constraints:

- $1 \leq T \leq 100$
- $1 \leq N \leq 10000$
- $0 \leq M \leq 500$
- ‘a’ ≤ u, v ≤ ‘j’

Output

For each test case, you have to print ‘YES’ (without quotes) if the given string can be rearranged in non-decreasing order, otherwise print ‘NO’.

Samples

Input	Output
3 adb 0 abed 2 d a e d abed 2 d a d g	NO YES YES