
# International Mother Language Day Programming Contest-2018

Arranged By-

## Programmers Arena

# A. The Immortals

Time limit per test: 1 second Memory limit per test: 256 megabytes

**International Mother Language Day** (**IMLD**) is a worldwide annual observance held on 21 February to promote awareness of linguistic and cultural diversity and promote multilingualism. First announced by UNESCO on 17 November 1999, it was formally recognized by the United Nations General Assembly in a resolution establishing 2008 as the International Year of Languages21st February 1952.

The 21st of February has been a day of national mourning, pride, reflection and action. It was also the Language Martyr's Day. It is 60 years ago on this day that among others, Barkat, Rafiq, Jabbar, Shafiur and Salam sacrificed their young precious lives for honor and preservation of mother language, Bangla.

It has been a day of pride for all people of Bangladesh that the supreme sacrifice made on this day in 1952 has eventually led to the recognition of preservation of mother languages worldwide. Only in 1954, the United Front government of Abu Hussain Sarker declared a public holiday for this day.

This Day has become a milestone in recognition of the right to speak, promote and preserve all mother languages across the world.

At the initiative of Bangladesh government, it was 17th November 1999, the Paris-based United Nations Educational, Scientific and Cultural Organization (UNESCO) adopted 21st February as the International Mother Language Day. For the first time, UNESCO observed 21st February, 2000 as the International Mother Language Day.(10)

Scottish historian and essayist Thomas Carlyle (1795-1881) called the language "the body of thought". This implies that if a mother tongue is crushed, thoughts and ideas will inevitably die.

About 6,912 mother languages are thought to exist today. But social, demographic and political factors are all contributing to possible disappearance of about 2,500 languages. Of the 2500 languages, 196 in India, 192 in the US, and 147 in Indonesia, are likely to disappear, according to a report of UNESCO.

Furthermore 199 languages are spoken by a few. For example, the language, Middle Chulym, now spoken by a handful in Siberian townsfolk (45 in number), has integrated into Russian language and once the last fluent speaker dies, the language will be extinct.

What is lost when a language is lost is another world, according to many language experts, valuable ethnographic and cultural information disappears when a language dies, leaving a gap in the understanding of the variable cognitive structures of which human brain is capable.

On February 23, 1948 in the Pakistan Constituent Assembly in Karachi, Dhirendranath Dutta, a member of the Pakistan Constituent Assembly, made a speech calling for Bengali to be made one of the official languages of Pakistan.

However, in 1948 on 19th March, Pakistan's Governor General Mohammad Ali Jinnah, popularly known as Quaid-e-Azam, claimed at a gathering of students of Dhaka University that Urdu should be the only state language of Pakistan, ignoring the fact that Bangla is the mother tongue of 56% of the people of Pakistan.

Meanwhile in 1950, students formed the "Bangla State Language Action Committee" and worked tirelessly to make Bangla one of the state languages of Pakistan.

The immediate starting point of the tragedy of 21st February is that on **27**th January, 1952, the then Prime Minister of Pakistan Khwaja Nazimuddin announced a public meeting that Urdu alone should be the state language of Pakistan.

The students were infuriated at the announcement because Nazimuddin as chief minister of East Bengal in 1948 signed an agreement with the leaders of 'Rashtrabhasa Sangram Parishad (State Language Action Committee) with a commitment to adopt a resolution of having Bangla as the other state language of Pakistan by the provincial Assembly. Many members of the Committee were non-students, such as, Professor Abul Kashem, Kamruddin Ahmed, (later Ambassador), Mohammad Toaha, Naimuddin Ahmed (later Advocate) and Abdur Rahman Chowdhury (later a Judge of the High Court).

It may be mentioned that subsequently students of the Dhaka University and Dhaka Medical College took a robust role in the cause of the Language Movement and took a crucial decision and defied the wishes of politicians to violate Section 144 (prohibiting an assembly more than five persons) on 21st February, 1952. . The then political leaders did not want to destabilize the political situation by lending support to students to violate Section 144 to delay general election in East Bengal, (later East Pakistan, now Bangladesh)..

On 21st February, 1952, agitated unarmed students of Dhaka University, violated Section 144 in protest, to proceed to the elected members of the East Bengal Legislative Assembly (near SM Hall) and present their demand to Nurul Amin, the Chief Minister.

On their way at the site of the Medical College students' hostel number 12, at 3-30 PM, the police opened fire on the peaceful procession of students by an order of a Magistrate (a West Pakistani).

Jabbar and Rafiq died on the spot, while three others died later in hospital ( an impromptu monument had been set up by Medical College students on the site of the current Shaheed Minar ) It is believed that many more were killed including a ten year old boy, but their bodies were taken away by the police and were secretly buried. The rest is history.

**It's a long story. Isn't it? Now the main question is on which day Khwaja Nazimuddin announced a public meeting that Urdu alone should be the state language of Pakistan?**

**Sample Input:**

21

(An integer number actually.)

**Sample Output:**

16

(It's not the exact output; find the real one by reading the story on which day Khwaja Nazimuddin announced a public meeting that Urdu alone should be the state language of Pakistan. )

Problem Setter: Bhagyobandhu Roy

# B. Can you find the SUM?

Time limit per test: 1 second Memory limit per test: 256 megabytes

Study on Accounting is very interesting. When **Dustu** (a name) first came up with this subject, he found out that the result of their maximum math is huge. Most of the time of their result is up to cores. Dustu wished if she had such an amount of money. She just learned how to make the trial balance, leisure shit etc. Here's the look of a trial balance. Take a closer look there.

| Accounts Title | Debit Taka | Credit Taka |
|---|---|---|
| Buildings | 7,00,000 | |
| Furniture & Fittings | 1,00,000 | |
| Purchases and Sales | 5,00,000 | 12,19,000 |
| Inventory (1-1-15) | 2,00,000 | |
| Allowances for Bad Debts | | 10,000 |
| 10% Loan (1-7-15) | | 40,000 |
| Accounts Receivable | 3,00,000 | |
| Accounts Payable | | 4,47,000 |
| Salaries Expenses | 1,00,000 | |
| Advertising Expense | 21,000 | |
| Carriage Outwards | 6,000 | |
| Store Expense | 2,00,000 | |
| General Expense | 65,000 | |
| Rent Income | | 10,000 |
| Insurance Expense | 4,000 | |
| 10% Investment | 50,000 | |
| Sonia Capital | | 6,00,000 |
| Sonia Drawings | 30,000 | |
| Bank Balance | 50,000 | |
| | 23,26,000 | 23,26,000 |

Do you find any problem there? No matter. Dustu collapsed after this stage. She has to add some huge number. The calculator which she is using is not enough for summing up the huge number. Now make a calculator that can sum up the huge number.

## Input:

First There will be an integer number **(T) (1<=T<=10000)** defining the test cases, the next line will contain two integer numbers **A** and **B.(A+B<=10^18).**

## Output:

For every test case your program has to determine the sum of those integer numbers.

## Sample input:

```
3
10 12
16 17
10000 10000
```

## Sample Output:

```
22
33
20000
```

Problem Setter: Bhagyobandhu Roy

# C. Binary Binary

Time limit per test: 1 second Memory limit per test: 256 megabytes

You all are familiar with binary number system, right? Each decimal number has its own binary representation containing 1s and 0s. There are an easy problem on manipulating binary digits in our textbook and you have to solve that. The problem is given below -

Given an integer number **N**. You have to find the number **M** immediate before the number N having the same number of 1s in its binary representation as like **N.**

As example, the previous number of 6(110) which has same number of 1s in its binary representation as like 6 is 5(101).

## Input

Input starts with an integer **T (**≤1**0**0) denoting the number of test cases.

Each case begins with an integer **N (1 ≤ N ≤ $10^9$)**.

## Output

For each case of input you have to print the case number and the desired result. If there are no number, print "NO".

| Sample Input | Output for Sample Input |
|---|---|
| 2<br>6<br>3 | Case 1: 5<br>Case 2: NO |

Problem Setter: Harunur Rashid

# D. Bit

Time limit per test: 1 second | Memory limit per test: 256 megabytes

You are given a number **S** in binary and an integer **n**. You have to determine whether the number **S** is divisible by **2^n (2 to the power n)** or not.

## Input

The first line of the input contains an integer **T (T<=500)** indicating the number of cases to be analyzed. Then **T** couples of lines follow.
For each one of this couples, the first line contains a binary string **S (length of S <=*100000 or 1e5*)** only consist of 0 and 1 and without leading zeros. The second line contains an integer ***n (0<=n<=100000 or 1e5)*.**

## Output

For each line of input, generate a line of output “Divisible" if given binary number S is divisible by 2^n or "Not divisible" if it's not.

## Sample input

2
100
1
1111
3

## Sample Output

Divisible
Not divisible

Problem Setter: Munir Islam

# E. Rupomoni and five sticks

Time limit per test: 1 second Memory limit per test: 256 megabytes

## History

Can you remember Oviman and Ovimani, the cute couple? Although they quarrel a lot, fortunately they have a girl named Rupomoni. Rupomoni is very intelligent. One day Oviman brought a bundle of sticks of distinct length to play a game with Rupomoni. The rules of this game are so easy. Oviman will give five sticks from the bundle and will ask Rupomoni.

**How many different triangles can Rupomony make?**

The game was so funny and Rupomony(A class three student) become successful is all cases. Now Oviman think to play this game with some programmers. That's why you have to solve this problem.

## Problem Description

You have five sticks **(s1, s2, s3, s4, s5)** of distinct length. How many different triangles can you make.

[You may choose any three of the five sticks to form the sides of triangle, Each triangle must have positive area and sticks cannot be bent or cut]

## Input:

Input will starts with an positive integer **T (T<100)** denotes test cases. For each test case, a line will start with five integers **s1, s2, s3, s4, s5(0<si<10000)**

## Output:

For each case output will print a single line with the number of ways to form a triangle.

| Input | Output |
|---|---|
| 2<br>1 2 3 4 5<br>1 2 3 4 6 | 3<br>2 |

Problem Setter: Sharif Chowdhury

# F.Mr.Bepari Loves Palindrome

Time limit per test: 2 second Memory limit per test: 512 megabytes

## Problem:

We know that Mr.Bepari is successful businessman in the world. He has a lots of business and he want increases more and more.

One day his friend name “Sorisha” came to him. He gave an idea to Mr.Bepari to export palindrome number in Mars. For that idea in this business he can earn more profit. So he need your help to find palindrome number.

**NB:** ***A positive integer is called a palindrome if its representation in the decimal system is the same when read from left to right and from right to left.***

## Input:

The first line contains integer **T (T<=100),** the number of test cases. Followed by **T** lines containing integers **N**.Here **N** is positive integer with not more **10^6**.

## Output:

Print “Yes” if they give N is palindrome number or find that write the value of the smallest palindrome larger than N to output.

## Sample Input:

2
99
211

## Sample Output:

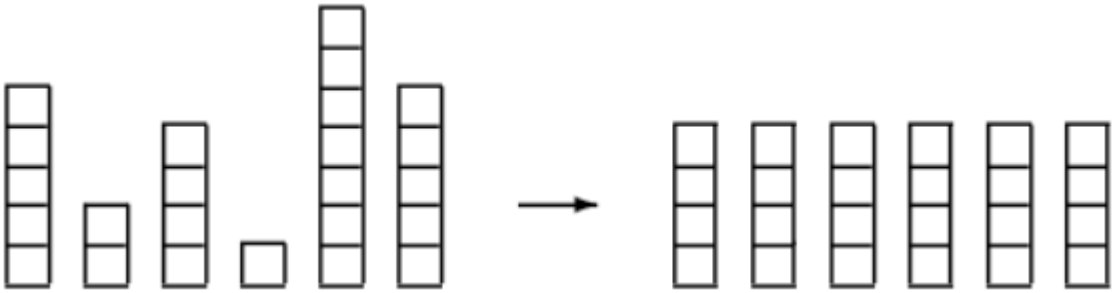
Yes
212

Problem Setter: Abdullah Al Mahmud Jabir

# G. BOX OF BRICKS

Time limit per test: 3 seconds Memory limit per test: 256 megabytes

Little Bob likes playing with his box of bricks. He puts the bricks one upon another and builds stacks of different height. “Look, I’ve built a wall!” he tells his older sister Alice. “Nah, you should make all stacks the same height. Then you would have a real wall.” she retorts. After a little consideration, Bob sees that she is right. So he sets out to rearrange the bricks, one by one, such that all stacks are the same height afterwards. But since Bob is lazy he wants to do this with the minimum number of bricks moved. Can you help?



## Input

The input consists of several data sets. Each set begins with a line containing the number N of stacks Bob has built. The next line contains nnumbers, the heights hi of the nstacks. You may assume 1<=n<=50 and 1<= hi<=100

The total number of bricks will be divisible by the number of stacks. Thus, it is always possible torearrange the bricks such that all stacks have the same height.The input is terminated by a set starting withn= 0. This set should not be processed.

## Output

For each set, first print the number of the set, as shown in the sample output. Then print the line ‘Theminimum number of moves isk.’, wherekis the minimum number of bricks that have to be movedin order to make all the stacks the same height.

## Sample Input

6
5 2 4 1 7 5
0

## Sample Output

Set #1
The minimum number of moves is 5.

Problem Setter: Ahsan Habib (Asst. Professor, C.S.E Dept,HSTU).

# H. Binary Search Tree

Time limit per test: 3 seconds | Memory limit per test: 256 megabytes

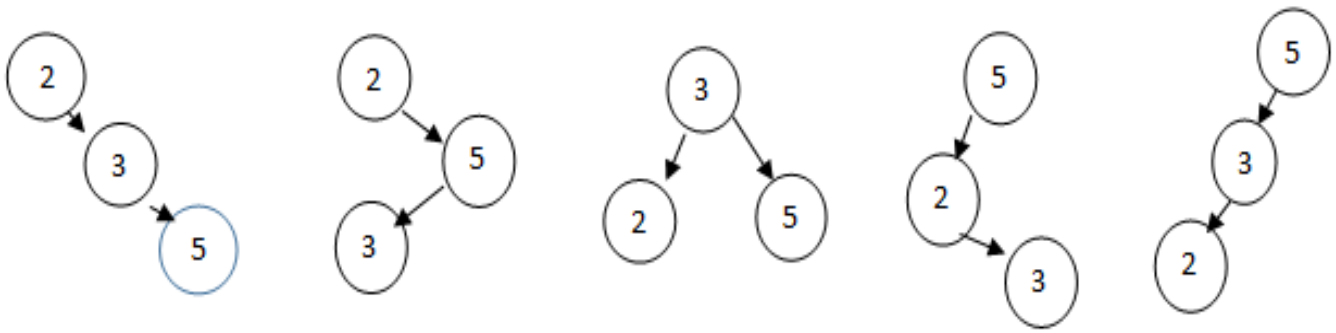
Binary Search Tree (BST) is a data structure following property

1. Each BST contains a root node and the root has not more than two children.
2. The left children of the root is contains all values less than or equal of the root values.
3. The right children of the root contain all values greater than of the root values.

An integer **N** is said to a prime number if **N** greater than 1 and have not any divisor without 1 and itself. The first few prime numbers are 2, 3, 5, 7, 11…..

Now you are given two integers **a and b**. Determine how many BST can be constructed using all prime numbers between **a and b**.

For example if a=1 b=6,primes number between a and b are: 2,3,5. Using these we can form the following five BSTs.




## Input:

First line you are given a test case **t (t<=100000).** Then t lines two integers **a and b (a<=b)** where **1<=a,b<=10000000**

## Output:

For each case, print the case number and the total number of distinct BSTs that can be formed by the prime number between a and b. Output the result modulo 100000007.

## Sample input:

2
1 6
10 30

## Sample Output:

Case 1: 5
Case 2: 132

Problem Setter: Saddam Hossain Shishir

# I. Easy Path Finder

Time limit per test: 3 seconds Memory limit per test: 1024 megabytes

Mr. KESHBULUM is special kind of travelling-sales man as hekeepsadequate knowledge about the contribution of the modern technologies. For instance, he knows about the mobile *apps* and their basic specialties. Thus, before travelling for sales he likes to use an *app* that can suggest him all reachable minimum-cost locations (Here, the cost is a processing result of distance, time and fare.) from his current location. But the *app* does not able to produce the required result all the time. Luckily, you have met with Mr. KESHBULUM and he describes the problem with a view to getting the solution from you. Thus, your job is to write an efficient computer program to find all those minimum-cost locations which are equal to or less than a given cost by Mr. KESHBULUM.


For better convenience, the reachable locations are represented by a consecutive unique integer number staring from 1 and 1 is always reserved for the current location of Mr. KESHBULUM. The cost to cover from one location to the next reachable location is given as integers.

## Input:

Input begins with an integer, $T$ ($0<T<100$), indicating the total number of test cases. The next line consists of three integers, $S$ ($1<=S<=10^3$), $R$ ($1<=R<=1000$), and $C$ ($0<=C<=10^5$) indicating the total number of locations, the total number of roads that link the locations and the given cost by Mr. KESHBULUM respectively. The next $R$lines take three integers $S1$ ($1<=S1<=S$), $S2$ ($1<=S2<=S$), $D$ ($1<=D<=50$), where $S1$ is any location, $S2$ another location reachable from $S1$, $D$ is the cost from $S1$ to $S2$.

## Output:

Print the total number of all those minimum-cost locations which are equal to or less than the given value of $C$.

| Sample Input | Output for Sample Input |
|---|---|
| 1<br>5 10 8<br>1 2 10<br>1 3 5<br>2 3 2<br>2 4 1<br>3 2 3<br>3 4 9<br>3 5 2<br>4 5 4<br>5 1 7<br>5 4 6 | 3 |

Problem Setter: Md. Palash Uddin, Assistant Professor, Dept. of CSE, HSTU, Dinajpur, Bangladesh.
Co-Author: Masud Ibn Afjal, Assistant Professor, Dept. of CSE, HSTU, Dinajpur, Bangladesh.

# J. Core Geometry

Time limit per test: 3 secondsMemory limit per test: 256 megabytes

In mathematics, there are numerous geometrical objects such as point, triangle, rectangle, circle, ellipse, etc. The points are the basic constituent elements for other kinds of objects. In 2D ($x$ and $y$ axis) co-ordinate system, a point can be represented as $P(x, y)$. Also the triangles, rectangles etc. can be of several types. For instance, a square is a special type of square whose all four lines (sides) are equal in length. For better understanding the problem lets' see the following figure of various geometrical objects.

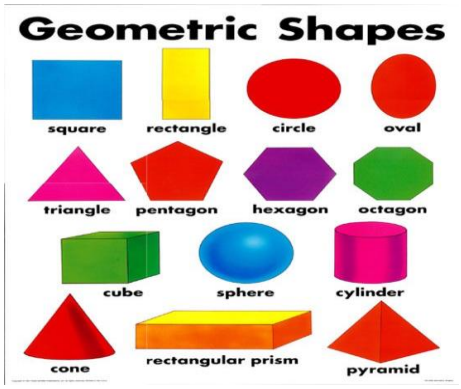



Fig. 1.Different geometrical items

In this problem, yourtask is to decide whether a given point is completely inside a given square or not. Furthermore, if it is inside the square, then find the first nearest coordinate point of the square to it. The points which are on the square should also be considered as inside the square. Moreover, the four coordinate points of the square may be given in any order. However, the point of the square whose coordinate values are smallest is considered as the first (1) coordinate point of the square and the rest points are numbered anti-clock wise as 2, 3, and 4 respectively.

## Input:

Input begins with an integer, $T$ ($0<T<=100$) which denotes the number of test cases. The subsequent line of input takes 4 pair of numbers; each of which pairs indicates the coordinate point of the square given in any order. The next line of input takes a pair of numbers which indicates the coordinate values of the point.

## Output:

Print the case number following either one ofthemessages "No, the square cannot grab the point. "If the point is not completely inside the square or "Yes, the first nearest coordinate point of the square to the given point is the $X$.", otherwise [Here, $X$is any point-number of the constructed square.]. See the sample input/output for detail.

## Sample Input:

```
2
2 1 6 1 65 25
8 8
2 1 6 1 6525
3 3
```

## Output for the Sample Input:

Case 1: No, the square cannot grab the point.

Case 2: Yes, the first nearest coordinate point of the square to the given point is the 1.

Problem Setter: Md. Palash Uddin, Assistant Professor, Dept. of CSE, HSTU, Dinajpur, Bangladesh.
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