



# **DIU TAKE OFF Programming Contest Spring 2018, Permanent Campus.**

**Organized By,  
Computer & Programming Club  
Daffodil International University  
Permanent Campus**

## Admin Panel:

*Advisor* : *MR. Bulbul Ahammad*  
*Lecturer (CSE), DIU*

*Administrator* : *Rjoanul Hasan Shanto.*

*Contest Judge* : *Rjoanul Hasan Shanto &*  
*Md. Razibul Hasan Mithu.*

*Judging director* : *Rjoanul Hasan Shanto.*

## Contest Platform:

*Platform* : *CodeMarshal*

*Special Thanks* : *Mohammad Mahmudur Rahman,*  
*Associate Professor (Adjunct), DIU*  
*CEO and Founder, MuktoSoft and CodeMarshal*  
*ACM ICPC World Finalist, 2007*  
*Judge ACM ICPC*

## Problem Setters:

- *Rjoanul Hasan Shanto* - *152-15-572*
- *Md.Razibul Hasan Mithu* - *161-15-882*
- *Amir Sohel* - *161-15-874*
- *Jayed Al Hasan* - *151-15-194*
- *Mohammad Shakil Mahmud* - *161-15-884*

# Problem Set:

## A. A Journey with Programming & Problem Solving

Score: 1.

CPU: 1s

Memory: 512MB

Today is the day we have been waiting for. **Daffodil International University**, Permanent Campus is going to start their journey with programming and problem solving again from this semester with hundreds of Programmers! You are one of them. Say hello to this amazing world by writing the most common program that most of the programmer start with.

You need to write the following code and submit it to get familiar with programming contest.

```
#include<stdio.h>
int main()
{
    printf("Hello World!\n");
    return 0;
}
```

## Input

There is no input in this problem.

## Output

Hello World!

## Sample

### Input

---

`/* There is no input for this problem */`

### Output

Hello World!

**Problem setter : Rijoanul Hasan Shanto.**

**Problem editor : MR. Bulbul Ahammad.**

**Problem Type : Very beginner.**

## B. Valo Ghora Fan!

Score: 1

CPU: 1s

Memory: 512MB

Though it is Spring now, the weather feels very hot as if it were summer. So, They, CPC community, are in need of buying a “**valo ghora fan**” in order to keep themselves cool. As they are currently very busy with arranging Take-off programming contest, they can't manage time to go for shopping. So they are now telling you two parameters **R** and **T** in which **R** represents the **rate of rotation** of the fan expressed in revolution per minute and **T** is the total time expressed in minute. You have to buy the fan and count its **total rotation in T** amount of time.

### Input

Input contains two integers **R** and **T** where **R** denotes the rev/min and **T** denotes the total time of rotation.

### Output

You have to print the **total rotation**.

## Sample

**Input**

**Output**

19 3

57

**Problem setters :** Rijoanul Hasan Shanto &  
Md. Razibul Hasan Mithu.  
**Dataset :** Md. Razibul Hasan Mithu.  
**Problem editor :** MR. Bulbul Ahammad.  
**Problem Type :** Ad hoc mathematics.

## C. Little monkey and oiled bamboo

Score: 1

CPU: 1s

Memory: 512MB

A little monkey was lost the forest. Unfortunately, it has come to a human village. Therefore, the monkey is cute, everyone of that village is expecting to get the monkey and they are trying to capture it. The monkey has become afraid and it is thinking to go as higher as it can. There is a bamboo standing on the land nearby the monkey. Now, the monkey is trying to climb at the top of the bamboo. Alas! the bamboo is oiled.

The monkey jumps **3 meters** at once but it slipped down **1 meter** every time without the last jump.

Now, if the bamboo is **N** meter higher from land then calculate the number of jumps the monkey need to climb at the top of the bamboo.

**Note: At the last jump the monkey will not be slipped down.**

### Input

Input will be an Integer **N** in the range ( **$3 \leq N \leq 100$** ).

### Output

Print only one Integer with a new line that describes the **number of jumps** little monkey needs.

## Samples

Input	Output
-------	--------

10
----

5
---

Input
-------

Output
--------

15
----

7
---

**Problem setter** : **Jayed Al Hasan.**

**Dataset** : **Jayed Al Hasan.**

**Problem editor** : **MR. Bulbul Ahammad.**

**Problem Type** : **Ad hoc mathematics.**



## D. Bachte hole jante hobe

Score: 1

CPU: 1s

Memory: 512MB



**MR. Sushasthoban** is very much worried about his friend **MR. Motashota** and **MR. Chikupiku**'s health conditions as **MR. Motashota** has no control over his **diet** and **MR. Chikupiku** seems to be unknown of what food is. The place where they get their food is fully automated. There is no limitation of eating food, no matter how much you pay. And when they go to have food there, they cleverly don't give their actual names. So, **MR. Sushasthoban** hires you to keep track of them who is coming. As you are a programmer, you know this is

very easy to do so just by calculating the **BMI** factor. For calculating the **BMI** factor easily, you can use the below **formula**.

$$BMI = \frac{Weight(kg)}{Height^2(m^2)}$$

**Note:** Standard **BMI** value ranges from **19** to **23** including both, and **1 inch = 0.025 meter**.

As you require both height and weight, you can collect them from automated sensors.

## Input

Input will contain two space-separated integers **H (Height in inch)** and Weight **W** in **KG**.

## Output

You have to print who're coming to get the food. If the **BMI** is below the standard range, print **"MR. Chikupiku! Ekta kinle arekta free!"**. If the **BMI** lies in between the standard range(inclusive), you have to print **"MR. Sushasthoban! Valoi asen taile!"**. If the **BMI** is greater than the standard range, you have to print **"MR. Motashota! Ar koto khabi!"**

## Sample

### Input

63 110

### Output

MR. Motashota! Ar koto khabo!

**Note:** Calculate **BMI** using floating point value.

*Problem setter : Md. Razibul Hasan Mithu &  
Rijoanul Hasan Shanto.*

*Dataset : Md. Razibul Hasan Mithu.*

*Problem editor : MR. Bulbul Ahammad.*

*Problem Type : Ad hoc mathematics.*

## E. Biggest Series

Score: 1

CPU: 1s

Memory: 512MB

As you are entering into the world of competitive programming contest, one of your seniors Gazi Amir Sohel who is a very romantic programmer of DIU permanent campus is giving you a very big opportunity. Only if you can solve the series below, he will give you a grand treat in the end of the contest.

$1-2+1-2+1-2+1-2+1-2+1-2+1-2+.....$

Think outside the box and consider large value of  $n$ . Please solve this problem and do not miss the opportunity.

### Input

The first line of input contains an integer  $T$  ( $1 \leq T \leq 50$ ), denoting the number of test cases. Each test case consists of one line containing an integer  $n$  ( $1 \leq n \leq 10^{18}$ ).

### Output

For each case, find the sum up to  $n$ 'th term of the given series.

## Sample

### Input

### Output

4

1

1

-1

2

-1

5

0

3

*Problem setter : Amir Sohel.*

*Dataset : Amir Sohel.*

*Problem editor : MR. Bulbul Ahammad.*

*Problem Type : Pattern finding.*

## E. [Series 3] Rescue Legend Hablu

Score: 1

CPU: 1s

Memory: 512MB

Remember him? The **legend Hablu**? Who left this world in order to go to a different planet in the previous **Take-off** Programming Contest? But now he can't stay there anymore without our talented future programmers. So, he decided to come back. Unfortunately, he got attacked by some **Aliens** on space! He is now in trouble! They, **aliens**, have imprisoned him into a highly secured prison. From last update, we came to know that they are using randomly generated **encrypted** code visual on lock screen to open the prison. Those **encrypted** code must be **decrypted** to unlock the prison and rescue our **legend Hablu**.

As you a very good programmer, **CPC** has given you the responsibility of decrypting the code and rescue **Mr. Hablu** from the prison.

So why do you hesitate? What are you thinking about! Help him right now! Being an emerging coder, get our legend back to us!

### Input

The input will start with an integer number **T** ( $0 < T < 1000$ ) denoting the number of test cases. Next **T** lines will contain a string **S** in every line ( $1 \leq S \leq 100$ ). **S** will contain numbers (**0-9**), some special character (**!, ", #, \$, %, &, ', \_**) and uppercase alphabets (**A-Z**). It is guaranteed that there will be not space in any string.

### Output

You need to print the **decrypted** code as shown in sample output.

## Sample

Input	Output
3	HELP_HELP_HELP
C@GKZC@GKZC@GK	QQQQ_SQSQQ
LLLLZNLNLL	HABLU_IS_IN_TROUBLE
C<=GPZDNZDIZOMJP=G@	

***Problem setter*** : ***Rijoanul Hasan Shanto.***

***Dataset*** : ***Rijoanul Hasan Shanto.***

***Problem editor*** : ***MR. Bulbul Ahammad.***

***Problem Type*** : ***String.***

# G. Voyager Message

Score: 1

CPU: 1s

Memory: 512MB

After the last **Take-Off** programming contest, **Shakil** got a job in **NASA**. He has been given his first project by **NASA**.



The project is about the **Voyager-1** (*Voyager 1 is a space probe launched by NASA on September 5, 1977*) and the **Hubble Space Telescope** (*Hubble is one of the largest space telescope*). **Voyager-1** sends data to hubble telescope about



the "**Solar System**", but hubble doesn't get all data that is given by **Voyager-1**. The **Voyager-1** gives data as a packet. Each packet contains **only digits (1-9)**.

**Shakil** found that, if the total number of digits is not a prime number (*prime is which has only two divisors 1 and itself*) hubble will convert it to next nearest prime number **M** and say "*i got it*". Otherwise hubble will say "*Bad luck*".

Now it is your time to help **Shakil**, so that he can say hubble got the data packet or not.

## Input

input starts with an integer **T ( $\leq 18$ )**, denoting the number of data packets. Each data packet will contain an Integer Number **N ( $1 \leq N \leq 10^{18}$ )**.

## Output

For each test case print the answer like sample below.

## Sample

### Input

2

12345

125657

### Output

Case 1: Bad luck

Case 2: 7 i got it

<b>Problem setter</b>	:	<b>Mohammad Shakil Mahmud.</b>
<b>Dataset</b>	:	<b>Md. Razibul Hasan Mithu.</b>
<b>Alternate Writer</b>	:	<b>Md. Razibul Hasan Mithu.</b>
<b>Problem editor</b>	:	<b>MR. Bulbul Ahammad.</b>
<b>Problem Type</b>	:	<b>String, Number theory.</b>

## H. Back to primary school mathematics

Score: 1

CPU: 1s

Memory: 512MB

**Mr. Kuber Majhi** is a computer science student at **Habar Dol University**. Recently during the semester break, he went home. His little niece **Tuni** reads in class **Four** and loves *mathematics* very much. Recently she got some interesting mathematical problems like shown in below:

$$\begin{array}{r} 234 \\ +15 \\ \hline 379 \end{array}$$

Gap ('#')

value of '#' is 4

However, when she was trying to solve those problems, she got stuck so many times and asked her uncle **Mr. Kuber Majhi** to help her many times repeatedly. After some time, **Mr. Kuber Majhi** got bored and decided to do something new. As all of those problems are similar so, why not to write a code which will find a solution of those problems.

Now suppose you are **Mr. Kuber Majhi** and you have to write a code to solve those problems for **Tuni**.

## Input

Input starts with an integer  $T (\leq 11)$ , denoting the number of test cases. For each test case there will be three values  $A, B, C (0 \leq A, B, C \leq 10^8)$  where  $A + B = C$ . but  $A$  or  $B$  or  $C$  must contain a character '#' which denoting the position of the gap. Now you have to find the value of '#'.

## Output

For each case, print the case number first. Then print the actual value of '#' which full fill the condition  $A + B = C$ .

## Sample

### Input

1  
245  
#14  
459

### Output

Case 1: 2

*Problem setter : Md Razibul Hasan Mithu.*  
*Dataset : Md. Razibul Hasan Mithu.*  
*Problem editor : MR. Bulbul Ahammad.*  
*Problem Type : String, Mathematics.*