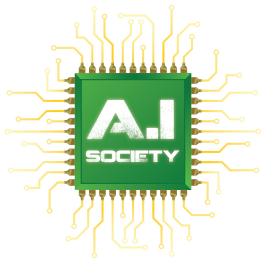


**PROGRAMMING CONTEST PROBLEM SET 2016/2**

**This problem set contains 8 problems (A-H).**

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**Hosted by**

**Artificial Intelligence Society**

**Faculty of Computer and Mathematical Sciences**

**Universiti Teknologi MARA Shah Alam**

|  |  |  |
| --- | --- | --- |
| A | EASY ENOUGH? | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

Ahmad always have difficulties in learning mathematic. He always has the lowest mark for exam in his class. So he decided to make his own calculator to help him answer the exam question. Here are the formula that he want to put in his calculator.

Can you help him to make his own calculator?

**INPUT**

The first line contains the number of test cases. Each line on a test case contains two numbers, x and y.

**OUTPUT**

Output the calculation answer. All output are in two decimal places.

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| Sample input | Sample output |
| 3  10 4  200 300  12 23232 | Case 1: 102.00  Case 2: 40017.32  Case 3: 296.42 |

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| B | LONGEST WORD IN HISTORY | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

Salman’s son love reading book. One day after he went back from school, he asked his mother how to recognize vowel and consonant. His mom then teach him how to recognize the vowel which are a,e,i,o,u. Other than that are all consonants. So in order to make him remember, his mother give him task to calculate the number of vowels and consonants in a sentence.

**INPUT**

The first line contains the number of test cases. Each line on a test case contain a sentence to be evaluated.

**OUTPUT**

The output of the program should print the number of vowels and consonants.

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| Sample Input | Sample Output |
| 3  abcdefghijklmnopqrstuvwxyz  Lopadotemachoselachogaleokranioleipsanodrimhypotrimmatosilphioparaomelitokatakechymenokichlepikossyphophattoperisteralektryonoptekephalliokigklopeleiolagoiosiraiobaphetraganopterygon  Pneumonoultramicroscopicsilicovolcanoconiosis | Case 1: 5 21  Case 2: 78 104  Case 3: 20 25 |

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| C | FACTORIAL OF A NUMBER | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

In mathematics, the factorial of a non-negative integer *n* denoted by *n!*, is the product of all positive integers less than or equal to *n*. For example:

6! = 6 x 5 x 4 x 3 x 2 x 1 = 720

**Input**

The first line of the input contains an integer N (1 ≤N ≤ 5), the number of test cases. Following the first line are the test cases. Each line in a test case contains a non-negative integer number.

The input must be read from standard input.

**Output**

The output of the program should print the result of the factorial of the numbers.

The output must be written to standard output.

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| **Sample Input** | **Sample Output** |
| 3  6  7  10 | Case 1: 720  Case 2: 5040  Case 3: 3628800 |

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| D | Safuan's Birthday | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

A person who is born on February 29 may be called a “leapling” or a “leap-year baby”. In non-leap years, some leaplings celebrate their birthday on either February 28 or March 1, while others only observe birthdays on the authentic intercalary date, February 29.

Safuan was born on February 29, 1994. He wants to find out whether there is going to be his actual birthday this year. Therefore, you need to help him find out on given year is leap year or not.

To determine whether a year is a leap year, follow these steps:

1. If the year is evenly divisible by 4, go to step 2. Otherwise, go to step 5.

2. If the year is evenly divisible by 100, go to step 3. Otherwise, go to step 4.

3. If the year is evenly divisible by 400, go to step 4. Otherwise, go to step 5.

4. The year is a leap year (it has 366 days).

5. The year is not a leap year (it has 365 days).

**Input**

The first line of the input contains an integer N (1 ≤ N ≤ 5), the number of test cases. Following the first line are the test cases. Each line of a test case contain one integer, Y, current year. 1<Y<10000.

**Output**

Display “Yes” if the given year is a leap year, otherwise “No”.

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| **Sample Input** | **Sample Output** |
| 5  2016  2015  2002  2004  1992 | Case 1: Yes  Case 2: No  Case 3: No  Case 4: Yes  Case 5: Yes |

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| --- | --- | --- |
| E | ANAGRAMS | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

Madam Azlin has invite you to play a game. In this game, you are given two words. You have to tell if one of them is the rearrangement of the characters of the other one. This pair of words is called ***anagrams.*** For example, “silent” and “listen” are anagrams. Another example of anagrams is: “odd” and “dod”.

Given two words containing only lowercase English alphabet characters, your task is to tell whether they are anagrams or not.

**Input**

The first line of the input contains the number of test cases. Following the first line are the test cases. Each line of a test case contains two single space separated strings.

**Output**

Print the output in a single line “Yes” if the two strings are anagrams, else “No”.

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| **Sample Input** | **Sample Output** |
| 4  odd dod  make cake  racecar carrace  ofdd odo | Case 1: Yes  Case 2: No  Case 3: Yes  Case 4: No |

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| --- | --- | --- |
| F | SURVIVE OR NOT? | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

Company KiplingMonkey have been badly hit by recession and is taking a lot of cost cutting measures. Some of these measures include giving up office space, going open source, reducing incentives, cutting on luxuries and issuing pink slips. They have got three (3) employees working in the accounts department and are going to lay-off two (2) of them. After a series of meetings, they have decided to dislodge the person who gets the most salary and the one who gets the least. This is usually the general trend during crisis like this. You will be given the salaries of these 3 employees working in the accounts department. You have to find out the salary of the person who survives.

**Input**

The first line of input is an integer T (T < 20) that indicates the number of test cases. Each case consists of a line with 3 distinct positive integers. These 3 integers represent the salaries of the three employees. All these integers will be in the range [1000, 10000].

**Output**

For each case, output the case number followed by the salary of the person who survives.

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| --- | --- |
| Sample Input | Sample Output |
| 3  1000 2000 3000  3000 2500 1500  1500 1200 1800 | Case 1: 2000  Case 2: 2500  Case 3: 1500 |

|  |  |  |
| --- | --- | --- |
| G | TIME SQUARE | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

Time Square in one of the popular shopping mall of Kuala Lumpur has a rectangular shape with the size *n* × *m* meters. On the occasion of the shopping mall's anniversary, a decision was taken to pave the Square with square granite flagstones. Each flagstone is of the size *a* × *a*.

What is the least number of flagstones needed to pave the Square? It's allowed to cover the surface larger than the Time Square, but the Square has to be covered. It's not allowed to break the flagstones. The sides of flagstones should be parallel to the sides of the Square.

**Input**

The input contains three positive integer numbers in the first line: *n*, m and *a* (1 ≤ n, *m*, *a* ≤ 10^9).

**Output**

Write the needed number of flagstones.

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| --- | --- |
| **Sample Input** | **Sample Output** |
| 3  6 6 4  1 1 1  2 1 2 | Case 1: 4  Case 2: 1  Case 3: 1 |

|  |  |  |
| --- | --- | --- |
| H | TRAILING SIFAR | |
| Input | Standard Input |
| Output | Standard Output |

**PROBLEM DESCRIPTIONS**

Sifar is a Malay word for zero or 0. In mathematics, trailing sifar is a sequence of 0s in the decimal representation of a number after which no other digits follow. The number of trailing sifar in the decimal representation of N! (5 <= N <= 1,000,000) is simply the multiplicity of the prime factor 5 in N!. Given a decimal integer N, you are to find the number of trailing sifar for N! For example, 10! = 3,628,800. Thus, the number of trailing sifar for 10! is 2.

**Input**

The first line of the input contains the number of test cases. Followed by integer input contains an integer N where 5 <= N <= 1,000,000.

**Output**

For each test case, the output the number of trailing sifar for N!

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| --- | --- |
| Input | Output |
| 3  5  10  118 | Case 1: 1 Case 2: 2 Case 3: 27 |