Programming competition questions

1. In a fast car race, a prize is awarded for the most traveled distance if the traveled distance is 500 km/hour, the prize is awarded if the traveled distance is a Harshad distance or not depending on its rule; Harshad number is an integer that is divisible by the sum of all its digits.

**Input:**

The input values are a single integer number between 150 and 500 inclusive.

**Output:**

The output is the message “Winner” if the traveled distance is Harshad distance, otherwise “Not winner”.

**Input example 1:**400

**Output example 1:**

Winner

**Input example 2:**

353

**Output example 2:**

Notx` winner

1. Mr Zaid Areda has been asked to design a zone for staff offices in the new ASAC building to accommodate new staff members, where each staff member will have his/her own rectangular office. He decided to have different companies design each staff office. All companies submit coordinates for their staff offices and construction begins when offices do not overlap.

As a developer, you have been hired to write a program that analyses office boundaries and reports to Mr Zaid Areda whether any staff office overlap. Two offices are considered to overlap, if one contains part of the other.

Each company will submit the (x,y) coordinates of the lower left and top right corners of their staff offices, where (0,0) indicates the bottom left corner of the office.

**Input:**

The input will consists of a line containing the number of offices, followed by on line per office in the format: x1 y1 x2 y2 where (x1,y1) is the lower left-hand corner of the rectangle and (x2,y2) is the upper right-hand corner of the rectangle.

**Output:**

The output will be "Overlap" if any offices overlap, otherwise "No Overlap".

**Input example 1:**3

1 1 2 2

3 3 5 5

1 4 2 6

**Output example 1:**

No Overlap

**Input example 2:**

2

1 1 3 3

2 2 5 7

**Output example 2:**

Overlap

1. Write a program to solve the following problem:

Given a currency system (a1,a2,a3,....,ak) (that is, there are coins worth a1 cents, a2 cents, ..., ak cents) and given a number N, output the number of ways to obtain N cents using the currency system.

**Input:**

The input values are entered on a single line, separated by white space. The first number is the number of coins, followed by various coin values (in increasing order), and finally the desired total amount.

**Output:**

The output consists of printing the input values and outputting the number of combinations.

**Input example 1:**3 2 10 11 9

**Output example 1:**

Coins: 2 10 11

Total: 9

Number of combinations: 0

**Input example 2:**

3 2 10 11 22

**Output example 2:**

Coins: 2 10 11

Total: 22

Number of combinations: 4

1. Write a program to read a string and output whether it is a valid or invalid password.

Passwords must have:

* 8 to 12 characters
* at least one numeric digit
* at least one alphabet
* must not have space or slash (/)
* at least one Capital letter
* starting character must not be a number

**Input:**

The input is a single line which contains the password

**Output:**

The output is the message "Valid Password" if the password obeys the conditions listed above, otherwise "Invalid Password".

**Input example 1:**fsa5/SAD

**Output example 1:**

Invalid Password

**Input example 2:**

sad5 GAdsa

**Output example 2:**

Invalid Password

**Input example 3:**

trfg3erGts

**Output example 3:**

Valid Password

1. In the supposedly uninhabited village, a tribe of unsuasl people (Wacmian) has been discovered. They have only 2 fingers and a thumb on each hand, and have invented their own numbering system. the digits they use and he symbols they use for digits are quite unusual, but anthropologists have been able to represent them as follows:

* % represents 0
* ) represents 1
* ~ represents 2
* @ represents 3
* ? represents 4
* \ represents 5
* $ represents -1 (yes, they have a negative digit)

As you may expect, their system is base 6 where each place value is 6 times the value to its right, as in the following examples:

* )@% is 1\*6^2 + 3\*6 + 0 = 36+18+0 = 54
* ?$~~ is 4\*6^3 + (-1)\*6^2 + 2\*6 + 2 = 864-36+12+2 = 842
* $~~ is (-1)\*6^2 + 2\*6 + 2 = 36+12+2 = -22

Your task is to take Wacmian numbers and represent them as standard base 10 numbers.

**Input:**

Input consists of Wacmian numbers, one per line. Each number consists of a sequence of 1 to 10 Wacmian digits. A single # in a line by itself indicates the end of input.

**Output:**

Output will be the corresponding decimal numbers, one per line.

**Input example 1:**)@%

?$~~

$~~

%

%

#

**Output example 1:**

54

842

-22

0

0

1. About 2000 years ago, there was a war and during one of its battles, the defendants were blocked by the attackers in the cave. To avoid capture, they decided to stand in a circle and kill each \*\*third\*\* other until only one person remains.

Your task is to determine for given number of people N and constant step K the poistion of a person who remains the last.

For example, if there are 10 people and they eliminate each third:

N=10 K=3

The sequence of counting looks like this (brackets show person who are eliminated)

* 1st round: 1 2 (3) 4 5 (6) 7 8 (9) 10
* 2nd round: 1 (2) 4 5 (7) 8 10
* 3rd round: (1) 4 5 (8) 10
* 4th round: 4 (5) 10
* 5th round: 4 (10)

So the winner is the fourth.

**Input:**

Input will contain number of people N and the counting step K.

**Output:**

Output should contain the number of person who will remain at the end. Initial numbering starts from 1.

**Input example 1:**15 4

**Output example 1:**

13

**Input example 2:**

17 2

**Output example 2:**

3

**Input example 3:**

19 6

**Output example 3:**

14