Question - 1

Sample Question

This is a sample question that helps you understand how input-output works on HackerRank. You do not need to write any code, but please read the question and the answer (code) below for a better understanding, before you start solving the remaining questions.

Sample Question

Given two positive integers a and b, your task is to complete the function **sumNum(int a, int b)** to return their sum.

Sample Input

2
3

Sample Output

5

Question - 2

Number Palindrome Detector

A palindrome is something that reads the same forwards and backwards. For example, these numbers are all palindromes:

1001
47274
6
44444

Note that 100 is not a palindrome, since it's lame to start a number with a leading zero (as in 00100).

Your job is to write a function ***isPalindrome()*** that takes in an array of numbers and returns a string array of "Yes" - without the quotes - (yes, it is a palindrome), or "No" (no, it is not a palindrome).

For the example above, the input will be:

4 // There are 4 numbers in this set
1001
47274
6
44444

and the output will be:

Yes
Yes
Yes
Yes

Question - 3

The Eight Queens Puzzle

A classic problem in chess is to place 8 queens on the board in such a manner that no two queens are on the same path. A queen can more up or down, left or right, and diagonally - forwards and backwards - as long as there are no other pieces in its path. Your input will consist of a chessboard with black squares marked as B, white squares marked as W, and squares with queens marked as Q. There will be 8 input lines, each line corresponding to each row of the chessboard, with 8 characters in each row coded as above. A sample input is shown below (Note that the sample input has spacing between the characters to aid readability - the actual input to the program has no spaces between the characters. The queens are also highlighted in bold).

You will be given chess board in the form of 2D-character array in the function ***isValid() .*** Complete the function to return a string - "Valid" (without the quotes - for a valid solution) or "Invalid" (without the quotes - for an invalid solution). Here's a sample input (a valid solution) for which your program needs to print out "Valid".

```
W B W B W Q W B
B W B Q B W B W
W B W B W B Q B
Q W B W B W B W
W B W B W B W Q
B Q B W B W B W
W B W B Q B W B
B W Q W B W B W
```

There are brute force ways to solve this problem, as well as methods and techniques that use ultra-cool data structures and methods. Your final evaluation will be based not only on correctness, but also on the techniques used to solve the problem. For example, think about how your solution would scale for a 1024-square chessboard where 1024 queens would be placed (You don't have to solve this one, but you may be asked about the technique you used in the interview).

Question - 4

Simply Statistics

The arithmetic mean of N numbers is the sum of the numbers, divided by N. The mode of N numbers is the most frequently-occurring number. Your program must output the mean and mode of a set of numbers.

There will be 2 lines of input in each test. The first line will indicate the count of numbers in the test case - the count will always be greater than 0, and the second line will consist of a space-separated list of numbers - as many numbers as indicated in the first line. Note that 0 and negative numbers are valid inputs. Here's a sample input:

```
5 // There will be five numbers in this
test case
1
2
```

7
3
2

The function ***simplyStats()*** provides you an integer array. You have to return a string that contains 2 numbers separated by a space. The first number is the mean of the input numbers and the second number is the mode.

3 2

Question - 5

Word Search Puzzle

You are given a grid of letters, followed by some words. The words can occur anywhere in the grid on a row or a column, forward or backwards. There are no diagonal words, however. The first line of the input consists of a single number which indicates the size of the letter grid. This will be followed by the letter grid itself with each row on a single line of input. Following the letter grid will be a line which indicates the count of the words to search for. This will be followed by the words themselves, one on each one. A sample input is shown below. (Note that in the sample input, there are spaces between the letters to aid readability. The actual test cases will have no spacing between the letters).

3 // Number of columns of the letter grid
3 // Number of rows of the letter grid
C A T // First row of the letter grid
I D O
M O M // Last row of the letter grid
4 // The number of words to search for
CAT
TOM
ADO
MOM

Write a function ***searchWords()*** that returns a string array with as many elements as the number of words to search for. Each array element will consist of "Yes" (without the quotes - the word is present in the grid) or "No" (without the quotes - the word is not present in the grid). It is super-important that you adhere exactly to the case of the letters in the output.

Question - 6

A Problem of Prime Importance

The objective is simple – to list all the prime numbers from a list of input numbers. The first line of input is a number indicating the count of numbers to follow, one per line. Your program should read each subsequent number from standard input, and for each of the n inputs, your program should print “Prime” (without the quotes - indicating whether the number is a prime number) or “Composite” (without the quotes - indicating whether the number is a composite number). It is super-important that the case of the output match the strings above. All numbers will be in the range $1 < n < 10^9$

Complete a function ***primeOrComposite()*** that accepts an array of integers and returns output corresponding to the numbers in the array.

Sample Input

```
8 // 8 integers follow
541
37
113
3
4
2
5
10
```

Sample Output

```
Prime
Prime
Prime
Prime
Composite
Prime
Prime
Composite
```