Name: ID: SEC:

Home Assignment (A2): Due May 6th during lab time (bring in a pendrive)

1) Write down a program that will find the summation of the following series, n will be input to your program:
   (a) $1^2-2^2+3^2-4^2$……up to n^2

Sample Input/ Output 1:

Enter a number: 10

The sum is: -55

Sample Input/ Output 2:

Enter a number: 25

The sum is: 325

   (b) 2 + 4 + 8 + 16 + ... *upto nth term*

2) Write down a program that will print all factors of a number n and the total number of factors of it. N will be input to your program. For example if N = 6, it has four factors namely 1, 2, 3, 6 and it has total 4 factors. So the output will be as follows:
   Sample Input/Output

```
Enter N: 6
1 2 3 6
Total factors: 4
```

```
Enter N: 54
1 2 3 6 9 18 27 54
Total factors: 8
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3) Write down a program that will find and print Lowest Common Multiplier (LCM) of two numbers x and y. The LCM is explained with an example below:
   Consider the numbers x = 12 and y = 15:
   The multiples of 12 are : **12, 24, 36, 48, 60, 72, 84, ...**.
   The multiples of 15 are : **15, 30, 45, 60, 75, 90, ...**.
   60 is a **common multiple** (a multiple of both 12 and 15), and there are no lower common multiples.

4) Write down a program that will find the summation of all Fibonacci numbers up to N-th Fibonacci number. N will be input to your program. For example if N = 5, your output will be 1+1+2+3+5 = 12.

5) Write a program that takes a 3-digit integer n as input and determines whether it is an Armstrong number or not. (An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since $3^3 + 7^3 + 1^3 = 371$)

6) Given two positive integers *a* and *b* as input find the smallest and largest prime numbers between them. Assume the smaller number in the range will be given as input first.