# SI@UCF Homework Assignment: Properties of Integers

## The Problem

Your program will prompt the user for a single positive integer greater than 1. If the user does not enter a valid integer, then your program should continue to reprompt the user for a value until a valid integer is entered. Once the integer is read in, your program will print out the following information about the integer:

- 1) A list of each of the positive factors of the given integer.
- 2) The number of factors the given integer has.
- 3) The sum of the factors of the integer.
- 4) The product of the factors of the integer.

The key idea which will help solve this problem is attempting to divide the given integer by each integer in between 1 and itself. If a particular division works "perfectly," then the value you have tried is a factor of the given integer. (Note: This description is intentionally vague so that you have to determine the specifics of the method of solution.)

#### **Input Specification**

The value the user enters will be a positive integer in between 2 and 100,000. There is no need for you to check if the user enters a valid value. Rather, assume that they do.

## **Output Specification**

Your output should follow the specification below:

```
Here is a list of the positive factors of X:
A B C D
The number of positive factors of X is Y.
The sum of the positive factors of X is Z.
The product of the positive factors of X is W.
```

#### **Output Samples**

Here are three sample outputs of running the program. Note that this set of tests is NOT a comprensive test. You should test your program with different data than is shown here based on the specifications given. The user input is given in *italics* while the program output is in bold.

```
Output Sample #1
Enter a positive integer greater than one.
9
Here is a list of the positive factors of 9:
139
The number of positive factors of 9 is 3.
The sum of the positive factors of 9 is 13.
The product of the positive factors of 9 is 27.
Output Sample #2
Enter a positive integer greater than one.
12
Here is a list of the positive factors of 12:
1 2 3 4 6 12
The number of positive factors of 12 is 6.
The sum of the positive factors of 12 is 28.
The product of the positive factors of 12 is 1728.
Output Sample #3
Enter a positive integer greater than one.
100
Here is a list of the positive factors of 100:
1 2 4 5 10 20 25 50 100
The number of positive factors of 100 is 9.
The sum of the positive factors of 100 is 217.
The product of the positive factors of 100 is 1000000000.
```

#### Extra Query

What is the relationship between the integer entered by the user, the number of factors that integer has and the product of those factors? If you have an answer, place it in your header comment for some extra credit!