Intro to CS / Python — Lab Assignment #6

See the course management system for due dates

Description

This lab exercise is designed to gain practice with both counting and sentinel controlled while loops. You will complete this lab using the work you did in the pre-lab portion for Lab 6.

Part I: Count Controlled While Loops

A count controlled while loop is a loop that uses a counter to control whether or not the loop keeps executing. The condition has to be based on a counter variable that is either counting up or down. When the counter reaches (or goes beyond) some maximum or minimum value, the loop will stop.

Factorial is a mathematical function that uses a countdown of sorts. The mathematical representation of factorial is N! where N! = N * (N-1) * (N-2) … * 1. Basically N is counting down, being multiplied into our factorial value until N is 1.

Example: 5! = 5*4*3*2*1 = 120

Use the answers you developed in the pre-lab to complete the following program used to compute and print out factorial. Fill in each step's logic below.

```
# Lab 6 - Part I
# Beth Allen
# This program computes factorial for a value (N) entered by the user.

# STEP 1:  Prompt the user for N and read it in and convert it into an integer


# STEP 2:  Initialize factorial to a default value before multiplying
# values into it


# STEP 3:  Complete the following loop to compute factorial

while N >          :   # STEP 3a: what is the condition to keep going?

       # STEP 3b:  multiply N x factorial and save it back into factorial variable

       # STEP 3c:  decrement N by 1


# Step 4:  Print out The resulting factorial value
```

Part II: Sentinel Controlled While Loop

A sentinel controlled loop is one that processes a list of data until a special value (or values) is reached. The loop condition checks for the special value to determine whether or not to stop executing.

For this program you will prompt the user for an integer number. As long as that number is not equal to 0, print out whether it is odd or even, and then get another number from the user. I have started the program by reading in the first number.

The output from this program should look like:

```
Enter a number. I will tell you if it is odd or even: 8
The number 8 is even.

Please enter another number, 0 to stop: 187
The number 187 is odd.

Please enter another number, 0 to stop: -17
The number -17 is odd.

Please enter another number, 0 to stop: 0

You entered 0. Goodbye
```

```
# Lab6 - Part II
# This program reads in numbers until the user enters a 0. For each number
# entered, prints whether it is even or odd.

number = int(input("Enter a number. I will tell you if it is odd or even: "))

while               : # STEP 1: condition that allows the loop to continue

       # STEP 2: print out whether the number is odd or even


       # STEP 3: prompt the user for the next number


print("\nYou entered 0. Goodbye")
```

Finishing Up:

Upload both of your program files for this lab submission. (It is permissible to put them both into the same program file if you wish.)