COSC 101: Fall 2017
Lecture 14: Loop Patterns

1. What is a sentinel value and why are they used for?

2. Two programmers were told to write a program that asks the user to type in a sequence of numbers and then prints their sum. The user can enter 999 to signal the end of the input. The number 999 is the sentinel and should not be included in the sum.

Programmer 1 wrote:

```python
total = 0
num = int(input("Enter num (999 to quit): "))
while num != 999:
    total += num
    num = int(input("Enter num (999 to quit): "))
print("Total is", total)
```

Programmer 2 wrote:

```python
total = 0
quit = False
while not quit:
    num = int(input("Enter num (999 to quit): "))
    if num == 999:
        quit = True
    total += num
print("Total is", total)
```

Which version is correct? If they both work, which version is better?
3. Rewrite the program from #2 to calculate the **average** instead of the total.

4. Rewrite the program from #3 to **prevent the user** from entering negative numbers. Each time a negative number is entered, show an error message and ask for a new number. Do not count negative numbers in the average calculation.
5. Write a program that asks the user to type a four letter word and then prints the censored version of the word (Ex: help becomes h***p). Each time the user does not enter a four letter word, show an error message and ask for a new word.

6. Imagine you work for a website with a user login. The website requires that all users have passwords that: (1) between five and twelve characters long and (2) include at least one number. Write a program that asks the use to reset their password.
7. Write a "guess a number" game. The computer chooses a secret number at random from 1 to 10. The user can make guesses and the computer gives hints (higher or lower). The game ends when the user guesses the number or gives up and types a negative number (a sentinel).