questions on page 118 (#1 - 9, and #11)

1. What is the purpose of a loop structure?
   Loop structures are a statement that executes a set of statements repeatedly based on a certain condition.

2. Explain the difference between a while statement and a do-while statement.
   A while loop evaluates the Boolean expression before evaluating, while a do-while executes the loop one time before evaluating the Boolean expression.

3. An input validation loop is a loop that checks user input for valid data. If valid data is not entered, the loop iterates until valid data is entered. In which review of this chapter did you write code for an input validation loop?
   Review: Prompter

4. a) What is an infinite loop?
   A loop where the condition of the loop never returns false.
   b) List two types of errors that can lead to an infinite loop.
   Syntax error(wrongly placed semicolon), logic error (number will never reach the condition)
   c) What is meant by overflow?
   When there are not enough bits to store a number, eventually causing it to maybe generate a runtime error or cause the condition to be false.

5. How many times will the d o - w h i le loop execute? int x = 0; do { x = x + 2; while (x < 120);
   60 times

6. What initial value of x would make the loop infinite? do { x = x + 3; while (x < 120)
   No initial value would make the loop infinite as the number will always end up exceeding 120 breaking the loop.

7. Compare and contrast counters and accumulators. List two uses for each.
   A counter is counting the amount of loop iterations and is initialized when declared and then incremented by a constant value. It can be used to keep track of a number of times something happens or make sure the loop is operating a certain amount of times. An accumulator isn't incremented by a constant value but rather it "accumulates"

8. Write a for statement that sums the integers from 3 to 10, inclusive.
   ```
   for(i=3; i<=10; i++)
   {
           Sum = i;
   }
   ```

9. List two factors that should be considered when determining which loop structure to choose.

Whether you want to run the code atleast once before determining, and if you know the certain amount of times you want the loop to run.

11. Consider the following assignment: String x = "my string."; Determine the value returned by each of the following methods:

a) x.length()
10

b) x.substring(0, 3)
my