

## CRT - Chapter 5

1. What is the purpose of a loop structure?  
To continue a statement for a specified amount of time, based on a condition
2. Explain the difference between a while statement and a do-while statement  
A **While** loop checks the conditions before running the loop, which may result in it not executing at all  
A **Do-While** loop will always run at least once prior to checking the condition
3. Guessing game mastery project
4. a) An infinite loop is a loop that will never terminate unless told otherwise  
b) Syntax error and logical errors  
c) Overflow is what happens when you assign a value that is out of range of the declared data type of the variable
5. How many times will the do-while loop execute?  
Int x = 0;  
Do {  
    x = x + 2;  
} while (x<120);  
Starting at x=0, it adds 2 each time until x=120, in which the statement x<120 will be false and the loop will terminate
6. What initial value of x would make the loop infinite  
do {  
    x = x - 3;  
} while ( x < 120 );  
x = 0
7. Compare and contrast counters and accumulators. List two uses for each.  
**Counters**
  - Count how many times a loop has executed
  - Count the number of inputs received from the user**Accumulators**
  - Can be used in calculating averages
  - Can be used in calculating the price of multiple items/groceries**Compare & Contrast**
  - Counters usually increment by a fixed amount, while accumulators add different numbers to a total
  - Counters are usually integers, while accumulators are often, doubles, floats, or integers.
8. Write a for statement that sums the integers from 3 to 10, inclusive  
int total = 0;  
for (int x = 3;x<=10;x++) {  
    total+=x;  
}  
System.out.print(total);

9. List two factors that should be considered when determining which loop structure to choose
  - a) If you want the loop to execute atleast once
  - b) If you want the loop to execute until a condition is met