

Chapter 5 CRT - Sophia Chen - CompSci 20

1. The purpose of a loop structure is to repeat a certain sequence of actions if the given condition is evaluated to be true, without the need to write out the same lines of code repetitively.
2. A while statement is a loop structure that executes a set of statements repeatedly based on a given condition, which is evaluated before iterations. A do-while loop is a loop structure that also executes a set of statements repeatedly, but based on a condition that is evaluated AFTER an iteration.
3. An input validation loop was written for review "AccountSetup".
4.
 - a) an infinite loop is a loop that continues indefinitely (forever).
 - b) One thing that can cause infinite loops to occur are syntax errors. One example of this is adding a semicolon after the condition in a while loop, causing the statement to repetitively check the condition over and over again.
Another thing that can cause infinite loops to occur are logical errors.
 - c) An overflow is a condition that occurs when a number is too large, and cannot be stored in a specified number of bits.
5. The do-while loop will execute 60 times.
6. Any initial value of x that is less than 120 will make the loop an infinite loop.
7. A counter is a variable used to keep track of how many times an event happens, by incrementing a value by a fixed amount during each iteration. Two uses of counters are as follows:
 - Counting the number of times a loop has been executed
 - Keeping account of the number of user inputs within a systemOn the other hand, an accumulator is a variable that is incrementing by varying amounts. Two uses of accumulators are as follows:
 - Summing up values in an array
 - Collecting a total score in a game as a player progresses through.
8.

```
Int sum = 0
for (int s = 3; s <=10; s++) {
    sum += s ;
}
```
9.
 - Number of iterations: Use a for loop when the number of iterations is known beforehand. Use a while or do-while loop when the number of iterations is determined by a condition when a program is running.

- Condition Positioning: Use a while loop if you want to check the condition before executing the loop body. Use a do-while loop if you want the loop body to be executed at least once before checking the condition.