1. What is the purpose of a loop structure? 2. Explain the difference between a while statement and a do-while statement.

A while loop checks the condition first, so it might not run at all. A do-while loop runs at least once before checking the condition.

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?

You likely wrote an input validation loop when checking if user input was valid, like asking for a number in a certain range.

4. a) What is an infinite loop? b) List two types of errors that can lead to an infinite loop. c) What is meant by overflow?

a) An infinite loop runs forever because it never meets its stopping condition.
b) Two errors that cause infinite loops are:

- Not changing the loop variable.
- Having a condition that is always true.
  c) Overflow happens when a number exceeds its limit and wraps around to a lower value.

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

The loop `int x = 0; do { x = x + 2; } while (x < 120);` will run 60 times, adding 2 each time until `x` reaches 120.

6. What initial value of x would make the loop infinite? do { x = x + 3; while (x < 120);

To make the loop `do { x = x + 3; } while (x < 120);` infinite, set x to 120 or higher to start.

7. Compare and contrast counters and accumulators. List two uses for each.

Counters count how many times something happens (like how many people entered). Accumulators add up values (like total scores).

8. Write a for statement that sums the integers from 3 to 10, inclusive.

```
int sum = 0;
for (int i = 3; i <= 10; i++) {
    sum += i;
}
```

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

1. **Clarity**: How easy is it to understand the loop's purpose and flow?
2. **Condition Type**: Do you need a specific number of iterations or should the loop run until a certain condition is met?