

1. What is the purpose of a loop structure?

To repeat a section of code multiple times

2. Explain the difference between a while statement and a do-while statement.

While may never run, do while will run at least once

4.

a) What is an infinite loop?

A loop that won't end

b) List two types of errors that can lead to an infinite loop.

Forgetting to update the loop control variable.

Using an incorrect or always-true condition

c) What is meant by overflow?

Overflow occurs when a numeric variable exceeds its maximum or minimum storage limit

5. How many times will the do - while loop execute?

```
int x = 0;  
do {  
    x = x + 2;  
    while (x < 120);  
}
```

60 executions.

6. What initial value of x would make the loop infinite?

```
do {  
    x = x + 3;  
    while (x < 120);  
}
```

Can only happen if X starts at such a low value that negative integer overflow occurs

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

Feature	Counter	Accumulator
Purpose	Keeps track of <b>how many times</b> something happens	Keeps a <b>running total of</b> values
Typical Operation	count = count + 1;	sum = sum + value;

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 = sum + i;}
```

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

Number of iterations known?

If known → use a for loop

If unknown → use a while or do-while loop

When should the condition be checked?

Before the loop → use while

After the loop → use do-while

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

c) x.toLowerCase()

my string

d) x.toUpperCase

MY STRING

e) x.trim()

My string