Q-2 ⇒ Define an infinite loop and discuss how to avoid it in while loops.

Ans ⇒ An infinite loop is a loop that continues executing indefinitely because its exit condition is never met. This can occur due to a variety of reasons, such as a mistake in the loop's termination condition or the absence of any termination condition at all. Infinite loops can lead to programs becoming unresponsive or consuming excessive system resources.

⇒ To avoid infinite loops, particularly in while loops, you should ensure that the loop's termination condition is properly defined and eventually evaluates to false. Here are some strategies to avoid infinite loops in while loops.

⇒
⇒) Ensure a proper exit condition.
⇒) Initialize ~~el proper~~ variables correctly
⇒ Update loop variables inside the loop
⇒ Use Break or return statements
⇒ Use a timeout mechanism.

5.1

Q-1 Briefly explain the primary categories of loops in programming.

Ans In programming, loops are used to execute a block of code repeatedly until a certain condition is met.

* for loop :-

⇒ A for loop is used when you know the number of times you want to execute a block of code. It typically consists of an initialization, a condition and an increment or decrement statement.

* while loop :-

⇒ A while loop is used when you want to execute a block of code repeatedly as long as a conditions is true. Unlike the for loop, the number of iterations isn't predetermined.

* Do-while loop :-

⇒ Similar to a while loop, a do-while loop executes a block of code repeatedly based on a condition. However, the key difference is that in a do-while loop, the block of code is executed at least once before checking the condition.