Loops (For, While, Do-While)

Question 1: Explain the different types of loops in JavaScript (for, while, do-while). Provide a basic example of each.

Answer 1:

* Loops are used to run a block of code multiple times. In JavaScript, there are three main types of loops: **for**, **while**, and **do-while**.

**1. For Loop:**

* A **for** loop runs a specific number of times, based on a condition.

**Structure:**

for (initialization; condition; increment/decrement) {

// Code to run

}

**Example:**

for (let i = 1; i <= 5; i++) {

console.log(i); // Prints 1, 2, 3, 4, 5

}

**2. While Loop:**

* A **while** loop runs as long as a condition is **true**.

**Structure:**

while (condition) {

// Code to run

}

**Example:**

let i = 1;

while (i <= 5) {

console.log(i); // Prints 1, 2, 3, 4, 5

i++;

}

**3. Do-While Loop**

* A **do-while** loop runs the code **at least once** before checking the condition.

**Structure:**

do {

// Code to run

} while (condition);

**Example:**

let i = 1;

do {

console.log(i); // Prints 1, 2, 3, 4, 5

i++;

} while (i <= 5);

**Summary:**

* **For loop:** Use when you know how many times to loop.
* **While loop:** Use when looping depends on a condition.
* **Do-while loop:** Use when the code must run **at least once**.

Question 2: What is the difference between a while loop and a do-while loop?

Answer 2: **Difference Between While and Do-While Loops:**

| **Aspect** |  | **While Loop** | **Do-While Loop** |
| --- | --- | --- | --- |
| **Condition Check** |  | Checks the condition **before** the loop runs. | Checks the condition  **after** the loop runs. |
| **Execution Guarantee** |  | May **not run at all** if the condition is false initially. | Always runs the code **at least once**, even if the condition is false. |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Example:**

* **While Loop:**

let count = 0;

while (count > 0) {

console.log(count); // Does not run because the condition is false.

}

* **Do-While Loop:**

let count = 0;

do {

console.log(count); // Prints 0 once, even though the condition is false.

} while (count > 0);

* Use **do-while** when you need the code to run **at least once**, even if the condition is false initially. Use **while** when the loop should only run if the condition is true from the start.