**Question 1: Explain the setTimeout() and setInterval() functions in JavaScript. How are they used for timing events?**

**setTimeout() and setInterval() in JavaScript**

JavaScript provides two key functions for handling timing events: setTimeout() and setInterval(). These functions allow you to execute code after a delay or at repeated intervals.

**1. setTimeout()**

The setTimeout() function executes a specified function once after a certain delay (in milliseconds).

**Syntax:**

setTimeout(function, delay, param1, param2, ...);

 function: The function to execute.

 delay: Time in milliseconds before execution.

 param1, param2, ...: (Optional) Arguments to pass to the function.

**Example:**

setTimeout(() => {

console.log("Hello after 2 seconds!");

}, 2000);

**Output:**  
After 2 seconds, it prints:

Hello after 2 seconds!

**Clearing setTimeout()**

If needed, you can cancel setTimeout() before it executes using clearTimeout().

let timer = setTimeout(() => {

console.log("This will not be printed!");

}, 3000);

clearTimeout(timer); // Cancels the timeout

**2. setInterval()**

The setInterval() function repeatedly executes a function at fixed time intervals.

**Syntax:**

setInterval(function, delay, param1, param2, ...);

* The arguments are similar to setTimeout(), but the function executes repeatedly after each interval.

**Example:**

setInterval(() => {

console.log("This message appears every 3 seconds!");

}, 3000);

**Clearing setInterval()**

To stop setInterval(), use clearInterval().

let interval = setInterval(() => {

console.log("This will stop after 9 seconds!");

}, 3000);

setTimeout(() => {

clearInterval(interval); // Stops the interval after 9 seconds

}, 9000);

**Use Cases**

* setTimeout()
  + Delayed execution of code (e.g., showing a popup after 5 seconds).
  + Animations with delay.
  + API call debouncing.
* setInterval()
  + Repeating actions like clock updates or real-time data fetching.
  + Animations that update continuously.
  + Creating a countdown timer.

**Question 2: Provide an example of how to use setTimeout() to delay an action by 2 seconds.**

**Example: Delaying a Message**

console.log("Wait for 2 seconds...");

setTimeout(() => {

console.log("This message appears after a 2-second delay!");

}, 2000);

**Explanation:**

1. The first console.log() runs immediately.
2. setTimeout() schedules the function to run **after 2000 milliseconds (2 seconds)**.
3. After 2 seconds, "This message appears after a 2-second delay!" is displayed.