Question 1: What is control flow in JavaScript? Explain how if-else statements work with an example.

* **Control flow** in JavaScript refers to the **order** in which the computer executes statements in a program.  
  By default, JavaScript runs code **from top to bottom**, one line at a time — **sequentially**.
* However, using **control flow statements**, we can alter this flow based on **conditions** or **loops**, such as:
* if, else if, else
* switch
* for, while, do...while
* break, continue, etc.

**🔸 if-else Statement**

The if-else statement is used to **execute code based on a condition**.

**✅ Syntax:**

*if (condition) {*

*// code runs if condition is true*

*} else {*

*// code runs if condition is false*

*}*

You can also use else if to check **multiple conditions**.

**✅ Syntax with else if:**

*if (condition1) {*

*// code for condition1*

*} else if (condition2) {*

*// code for condition2*

*} else {*

*// code if none of the above conditions are true*

*}*

**✅ Example:**

*let age = 18;*

*if (age < 18) {*

*console.log("You are a minor.");*

*} else if (age === 18) {*

*console.log("You just became an adult!");*

*} else {*

*console.log("You are an adult.");*

*}*

**Output:**

You just became an adult!

Question 2: Describe how switch statements work in JavaScript. When should you use a switch statement instead of if-else?

* A switch statement is used to **perform different actions based on different values**.  
  It provides a **cleaner and more readable** alternative to writing many if-else if conditions — especially when checking the **same variable** against multiple possible values.

**✅ Syntax:**

*switch(expression) {*

*case value1:*

*// code block*

*break;*

*case value2:*

*// code block*

*break;*

*...*

*default:*

*// code block if no case matches*

*}*

**🔸 How It Works:**

1. The switch expression is **evaluated once**.
2. Its result is compared with each case value.
3. If a match is found, the corresponding **code block runs**.
4. The break statement exits the switch block.
5. If no match is found, the default block (if provided) is executed.

**✅ Example:**

*let day = 3;*

*switch (day) {*

*case 1:*

*console.log("Monday");*

*break;*

*case 2:*

*console.log("Tuesday");*

*break;*

*case 3:*

*console.log("Wednesday");*

*break;*

*default:*

*console.log("Invalid day");*

*}*

**🔍 Output:**

Wednesday

**🔸 When to Use switch Instead of if-else:**

| **Use if-else when...** | **Use switch when...** |
| --- | --- |
| You need to evaluate **ranges or conditions** | You are comparing a variable to **many exact values** |
| Conditions are **complex** (e.g., a > 10) | Conditions are **simple** (e.g., a === 1) |
| You are using **logical operators** | You are checking **equality only** |
| More flexible but can be messy for many cases | Cleaner for long lists of matching values |