1. The "Hello, World!" Program

Detailed Explanation:

- The **"Hello, World!"** program is a traditional first step when learning a new programming language. It helps verify that the development environment is working properly and introduces the syntax of the language.

- In **JavaScript**, you can use the console.log() function to output "Hello, World!" to the console. The **console** is a tool in the browser's developer tools that allows you to run JavaScript commands and view errors.

Code Snippet:

javascript

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```javascript
// Output "Hello, World!" to the console

console.log("Hello, World!");
```

In-depth Questions:

1. **What is the purpose of the console.log() function in JavaScript?**

   - **Answer**: console.log() is used to display output in the browser's console, which is useful for debugging or displaying information.

2. **Why is "Hello, World!" commonly used as the first program in any language?**

   - **Answer**: It serves as a simple test of the programming environment and demonstrates the basic syntax of the language.

Practice Question:

- **Write a program that outputs your full name to the console using console.log().**

javascript

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```javascript
console.log("Stavan Kodolikar");
```

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2. HTML and JavaScript Integration

Detailed Explanation:

- **HTML (HyperText Markup Language)** defines the structure of web pages, while **JavaScript** adds interactivity and functionality.

- To run JavaScript on a webpage, you embed the code using the <script> tag. The script can be written directly within the HTML file or linked externally via a .js file.

- **Basic HTML Document**:

html

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```html
<!DOCTYPE html>
<html>
 <head>
  <title>Hello World Example</title>
 </head>
 <body>
  <script>
   console.log("Hello, World!");
  </script>
 </body>
</html>
```

In-depth Questions:

1. **Where is the <script> tag placed in an HTML document, and what does it do?**

   o **Answer**: The <script> tag is usually placed inside the <head> or <body> sections of an HTML document. It allows JavaScript code to be embedded and executed by the browser.

2. **What is the difference between embedding JavaScript directly in the HTML vs. linking an external JavaScript file?**

   o **Answer**: Embedding JavaScript directly includes the code within the HTML file, while linking to an external file keeps the code in a separate .js file, which is a cleaner approach, especially for larger projects.

Practice Question:

- **True or False**: JavaScript must always be written directly in the HTML file using the <script> tag.

  o **Answer**: False (JavaScript can be included in an external file and linked using the src attribute).

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3. Running JavaScript in the Browser Console

Detailed Explanation:

- The **browser console** allows you to run JavaScript code directly. You can open the console using Ctrl+Shift+I (Windows/Linux) or Cmd+Option+I (Mac), and it is part of the browser's developer tools.

- **How to run JavaScript in the console**: Open a blank page (about:blank), open the console, and type JavaScript commands. For example:

javascript

Copy code

console.log("Hello, World!");

In-depth Questions:

1. **What is the purpose of the browser console, and how do you access it?**

   o **Answer**: The browser console is part of the developer tools and is used for debugging JavaScript code. You can access it by pressing Ctrl+Shift+I (Windows) or Cmd+Option+I (Mac).

2. **What happens when you type console.log("Hello, World!"); in the console?**

   o **Answer**: It outputs "Hello, World!" to the console window.

Practice Question:

- **How do you access the developer tools in Chrome to run JavaScript?**

   o **Answer**: Press Ctrl+Shift+I (Windows/Linux) or Cmd+Option+I (Mac), and navigate to the "Console" tab.

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4. Tasks Based on console.log()

Detailed Explanation:

- JavaScript allows you to use console.log() to output multiple arguments or concatenate strings using the + operator.

- You can pass several arguments to console.log() separated by commas, or concatenate strings using the + sign:

javascript

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// Multiple arguments

console.log("Name", "Surname", "(Year)");

// Concatenation using +

console.log("Name" + " Surname" + " (Year)");

In-depth Questions:

1. **What is the difference between passing multiple arguments to console.log() and using string concatenation?**

   o **Answer**: Passing multiple arguments to console.log() separates them with spaces, while using concatenation with + joins the strings directly.

2. **What would the following code output?**

javascript

Copy code

console.log("Stavan", "Kodolikar", "(1989)");

   o **Answer**: It would output Stavan Kodolikar (1989).

Practice Question:

- **Write a program that outputs your name and year of birth on consecutive lines using console.log().**

javascript

Copy code

console.log("Stavan");

console.log("Kodolikar");

console.log("1989");

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5. JavaScript Code in Local Files

Detailed Explanation:

- You can create local HTML and JavaScript files on your computer and run them in the browser.

- For example, create an **HTML** file that includes an external **JavaScript** file:

html

Copy code

<!DOCTYPE html>

<html>

 <head>

  <title>JavaScript Example</title>

```html
  <script src="main.js"></script>
 </head>
 <body>
 </body>
</html>
```

- Then, create a separate main.js file with JavaScript code:

javascript

Copy code

```javascript
console.log("Hello, World!");
```

In-depth Questions:

1. **How do you run a local HTML file in a browser?**

   - **Answer**: You can open the HTML file by dragging it into the browser window or by using the Open command in the browser's file menu.

2. **What is the benefit of linking to an external JavaScript file instead of embedding the code directly in HTML?**

   - **Answer**: It keeps the HTML file clean and allows for better code organization, especially when using the same JavaScript code across multiple pages.

Practice Question:

- **Write the HTML and JavaScript code needed to display "Hello, World!" in the console using an external JavaScript file.**

HTML:

html

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```html
<!DOCTYPE html>
<html>
 <head>
  <title>Hello World Example</title>
  <script src="main.js"></script>
 </head>
 <body>
```

```
  </body>
</html>
```

JavaScript (main.js):

javascript

Copy code

```javascript
console.log("Hello, World!");
```

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6. Task-Based Practice

Tasks from the file:

- **Task 1**: Use console.log to output your full name to the console.

javascript

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```javascript
console.log("Stavan Kodolikar");
```

- **Task 2**: Output your year of birth.

javascript

Copy code

```javascript
console.log(1989);
```

- **Task 4**: Output your name, surname, and year of birth as separate arguments.

javascript

Copy code

```javascript
console.log("Stavan", "Kodolikar", "(1989)");
```

- **Task 6**: Concatenate your name, surname, and year of birth using + signs.

javascript

Copy code

```javascript
console.log("Stavan" + " Kodolikar" + " (1989)");
```

Practice:

- **True or False**: You can pass multiple arguments to console.log() and they will be separated by spaces.
  - **Answer**: True.