Short Answer:

Answer the following questions with complete sentences in **your own words**. You are encouraged to conduct your own research online or through other methods before answering the questions. If you research online, please consult multiple sources before you write down your answers.

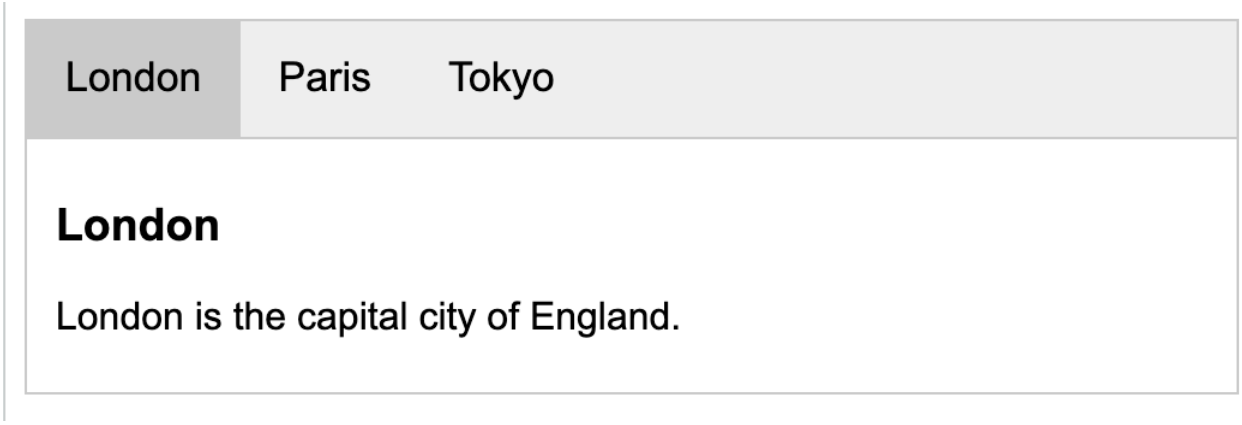
1. What is ECMAScript?
2. What is the JavaScript engine?
3. Explain just-in-time (JIT) compilation. What's the difference between JIT compilation and interpretation?
4. What is REPL?
5. What are primitive data types in JS?
6. What are reference data types in JS?
7. What is type coercion, and how does it differ from type conversion?
8. What is dynamic typing?
9. What is immutability?
    1. What data types are immutable?
10. What is the difference between == and ===?
11. What are some examples of falsy values in JS?
12. Explain short-circuit evaluation.
13. How do primitive and reference data types differ in where they're stored in memory?
    1. How does this affect them when they are passed as arguments to a function?
14. What are 3 ways to declare functions? What is their syntax?
15. How do first-class functions differ from higher-order functions?
16. What are pure functions?
17. What are 3 ways to iterate an array? What is their syntax?
18. What are the major differences between a set and array?
19. What are the major differences between a map and object?
20. What is the DOM?
21. How can you select an HTML element using JS?
22. What is a DOM event?
23. What is the Event interface?
24. How do we register event handlers for a selected element?
25. What is event propagation? How many phases are there? In what order does it occur?
26. Explain event delegation. Why is it important?

Coding Questions:

Use HTML/CSS/JS to solve the following problems. You are highly encouraged to present more than one way to answer the questions. Please follow best practices when you write the code so that it would be easily readable, maintainable, and efficient. Clearly state your assumptions if you have any. You may discuss with others on the questions, but please write your own code.

1. Given the following UI and HTML code, implement the following features, while matching the styling ***as closely*** as possible.

- By default, the London tab is selected and only its content is displayed.
- When the user clicks on a tab, it is the only one that becomes highlighted, and only the corresponding content will be displayed.
    - Ex: The user clicks 'Paris', so only the 'Paris' content is displayed.




```
<body>
	<div class="tab">
		<button>London</button>
		<button>Paris</button>
		<button>Tokyo</button>
	</div>

	<div>
		<h2>London</h2>
		<p>London is the capital city of England</p>
	</div>

	<div>
		<h2>Paris</h2>
		<p>Paris is the capital of France.</p>
	</div>

	<div>
		<h2>Tokyo</h2>
		<p>Tokyo is the capital of Japan.</p>
	</div>
</body>
```

2. Given the sample UI, implement the following product management page with styling that matches as closely as possible.
- The user can fill out the fields and click “Add New” to create a new product in the table. However, if any of the input fields are empty, no product should be created.
- The user can delete existing products in the table by clicking the delete button.
- By default, when the user loads the page for the first time, there should be these 3 items in the table as shown below.

Product Name	Product Category	Product Price	Action
M&M	Snacks	$1.99	Delete
Table	Furniture	$199	Delete
Kale	Vegetables	$2.49	Delete

Add Product

Product Name: Product Category: Product Price: Add New

3. Longest Substring Without Repeating Characters
Given a string s, find the length of the longest substring without repeating characters.

Implement a basic UI where users may type the inputs to your function and click submit.
- This takes the user input, passes it as arguments to your function, and calculates the output.
- This output should be displayed on the webpage dynamically.

Example 1:
Input: s='abcabcbb'
Output: 3
Explanation: The answer is "abc", with the length of 3.

Example 2:
Input: s='bbbbbb'
Output: 1
Explanation: The answer is "b", with the length of 1.

Example 3:
Input: s='pwwkew'
Output: 3
Explanation: The answer is "wke", with the length of 3. Notice that the answer must be a substring, "pwke" is a subsequence and not a substring.