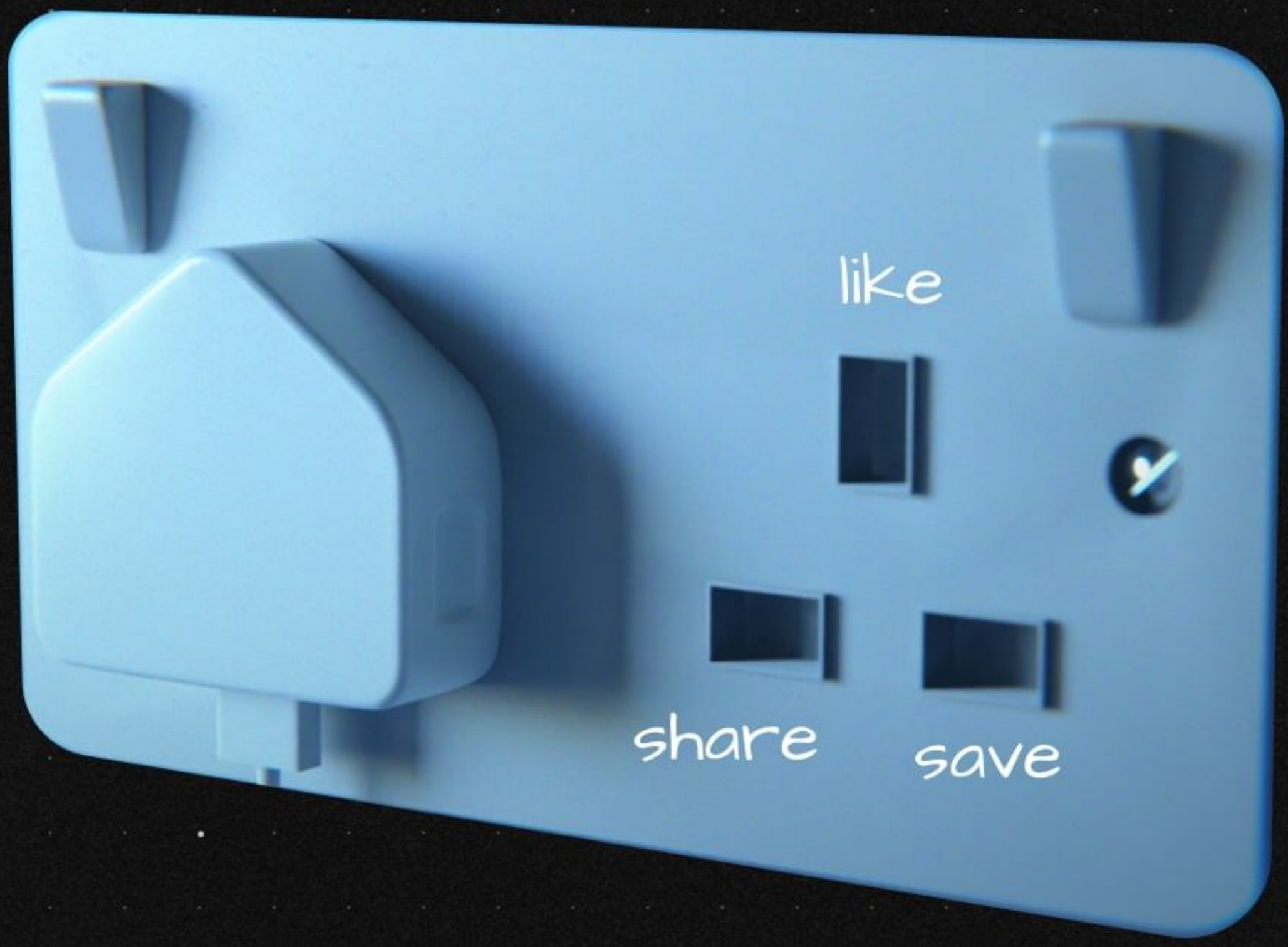
JS

Most common JavaScript
Interview Questions

WebSockets
in JavaScript



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WebSockets in JavaScript allow for real-time, bidirectional communication between a client (usually a web browser) and a server.

They are particularly useful for building interactive web applications that require instant data updates.

Understanding WebSockets

WebSockets provide a full-duplex communication channel over a **single TCP connection**.

Unlike HTTP, WebSockets enable both the client and server to send messages to each other at any time without waiting for a request from the client.

WebSockets use a protocol that starts with **`ws://`** (unencrypted) or **`wss://`** (encrypted) instead of http:// or https://

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Creating a WebSocket Connection

To establish a WebSocket connection in JavaScript, create a new WebSocket object, passing the WebSocket server **URL as a parameter**.

```
const socket = new WebSocket('ws://example.com/socket');
```

WebSocket Events

WebSocket objects emit **various events** to **handle different stages** of the connection.

open: Triggered when the connection is successfully established

```
socket.addEventListener('open', (event) => {
  // Connection is open.
});

socket.addEventListener('message', (event) => {
  const message = event.data;
  // Handle incoming message.
});
```

message: Fired when the server sends a message

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error: Triggered when an error occurs

```
socket.addEventListener('error', (event) => {
  console.error('WebSocket error:', event);
});

socket.addEventListener('close', (event) => {
  if (event.wasClean) {
    console.log(`Connection closed cleanly,
code=${event.code}, reason=${event.reason}`);
  } else {
    console.error('Connection abruptly closed');
  }
});
```

close: Fired when the connection is closed

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Sending Data

To send data to the server, use the `send` method of the WebSocket object. Data can be a string, ArrayBuffer, or Blob.

```
socket.send('Hello, server!');
```

Closing the Connection

To close the WebSocket connection, call the `close` method on the WebSocket object.

```
socket.close();
```

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Server-Side WebSocket Implementation

On the server side, you need to implement a WebSocket server that **listens** for WebSocket connections and **handles** messages from clients. **Popular libraries** for this purpose include **ws for Node.js** and libraries for various languages like Python, Ruby, and Java.

Error Handling

Be sure to handle errors gracefully by listening for the error event and **providing appropriate feedback** to the user.

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Security Considerations

When using WebSockets, consider security measures like encrypting the connection using `wss://`, implementing authentication, and validating incoming messages to prevent vulnerabilities like WebSocket-based attacks.

Use Cases

WebSockets are suitable for real-time chat applications, online gaming, live notifications, collaborative tools, and any scenario where immediate data updates are required.

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