

Report Day: 5.4

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Task:

1. What is JSON?

JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is used to store and exchange data between a server and a client or between two systems. JSON is easy to read and write for humans and easy to parse and generate for machines.

Features of JSON:

- Based on key-value pairs.
- Language-independent (but derived from JavaScript).
- Supported in most programming languages.
- Used in APIs and web services.

Advantages:

Lightweight and easy to read.

Fast parsing and data access.

Ideal for configuration and data storage.

2. LocalStorage:

LocalStorage is a part of the Web Storage API that allows websites to store data in the browser **with no expiration date**. The data persists even after the browser is closed.

Key Characteristics:

- Stores data as key-value pairs.
- Data is stored in string format.
- Maximum size: Around 5MB.
- Synchronous API (can block JS if large operations are done)

Benefits of LocalStorage:

- Great for storing user preferences.
- No need for server communication.
- Easy to use with JSON.

Using JSON with LocalStorage:

Since LocalStorage only supports strings, we often use `JSON.stringify()` and `JSON.parse()` to store and retrieve complex data types like objects or arrays.

```
let student = {
  name: "Ayesha",
  marks: 92,
  subjects: ["Math", "Science"]
};

// Convert object to string and store
localStorage.setItem("studentData", JSON.stringify(student));

// Retrieve and convert back to object
let data = JSON.parse(localStorage.getItem("studentData"));
console.log(data.name); // Output: Ayesha
```

Conclusion:

JSON and LocalStorage are powerful tools for front-end web development. JSON is ideal for structuring data, while LocalStorage helps in persisting that data on the client side. Together, they enable fast and dynamic web applications without relying heavily on servers