11 – Serialization and Deserialization

**Serialization**

The process whereby an object or data structure is translated into a format suitable for transfer over a network, or for storage.

In JavaScript, one way of serializing an object is by converting it into a JSON string using the method JSON.stringify().

const user = { name: "Alice", age: 25 };  
const serialized = JSON.stringify(user);  
console.log(serialized); // '{"name":"Alice","age":25}'

The above object has been converted to a JSON string, which can be used to store/transmit data.

The two most commonly used Serialization formats are JSON and XML. However, XML is mostly used in legacy code nowadays.

**Deserialization**

The reverse process of Deserialization, whereby a string is converted back into a JavaScript object.

In JavaScript, one way of deserializing an object is by passing it through the JSON.parse() method.

const received = '{"name":"Alice","age":25}';  
const user = JSON.parse(received);  
console.log(user.name); // "Alice"

It now behaves like a normal JavaScript object again.

**Use Cases**

1) Web APIs: Data is transmitted in JSON (serialized) format.

2) Local Storage: In JavaScript, data is only stored as strings. Hence, the data must be serialized.

3) Network Transfer: Serialization is essential for transferring data via HTTP or sockets.

**Caveats of JSON Serialization**

* JSON Serialization does not support functions and symbols.
* Dates are converted into strings, which cannot be deserialized directly back into dates.

**Understanding Serialization through Teleportation**

Suppose a human wants to be teleported from point A to point B. However, the person cannot be physically moved and instead has to be transmitted through a teleportation beam.

First, the person is scanned. Their attributes, such as height, weight, memories, etc., are converted to a digital blueprint.

This process of converting the human into a teleportable form is known as Serialization.

The other end of the Teleportation device then receives the transmitted form of the human. They are then converted back from the transmittable form to their original form by the process of Deserialization.

Similar to how human transportation may not be able to scan the soul of the human or reconstruct emotions properly, JSON strings do not support functions and symbols, and dates cannot be converted back into Date objects from strings.