Object destructuring assignment

Absolutely! Let’s go deep into **Object Destructuring Assignment** in JavaScript.

🔷 What is Object Destructuring?

Object destructuring is a convenient way to **extract multiple properties** from an object and assign them to variables in a single statement.

🔶 Basic Syntax

```
const user = {
  name: "Abhi",
  age: 22,
  country: "India"
};

// Destructuring
const { name, age } = user;

console.log(name); // "Abhi"
console.log(age);  // 22
```

🔷 Why Use Object Destructuring?

✅ Makes code cleaner and easier to read

✅ Avoids repetitive `obj.propName` access

✅ Useful in function parameters and return values

🔷 More Use Cases

1. Rename variables

You can assign a property to a variable with a different name:

```
const user = { name: "Abhi" };
const { name: userName } = user;

console.log(userName); // "Abhi"
```

2. Set default values

If a property is `undefined` or missing, you can assign a default:

```
const user = { name: "Abhi" };
const { age = 25 } = user;

console.log(age); // 25
```

3. Nested objects

You can destructure nested properties too:

```
const user = {
  name: "Abhi",
  address: {
    city: "Mumbai",
    zip: "400001"
  }
};

const {
  address: { city }
} = user;

console.log(city); // "Mumbai"
```

4. Function Parameters Destructuring

You can destructure directly in function arguments:

```
function greet({ name, age }) {
  console.log(`Hello ${name}, you are ${age} years old.`);
}

greet({ name: "Abhi", age: 22 });
```

5. Rest Operator in Destructuring

Capture remaining properties using the rest operator `...`:

```
const user = {
  name: "Abhi",
  age: 22,
  country: "India"
};

const { name, ...rest } = user;
console.log(name); // "Abhi"
console.log(rest); // { age: 22, country: "India" }
```

🔷 Invalid or Tricky Cases

❌ Destructuring `undefined` or `null`

This will throw an error:

```
const { name } = null; // ❌ TypeError
```

✅ To avoid that, use default object:

```
const { name = "Guest" } = null || {};
```

✅ Summary Table

Use Case	Syntax Example
Basic Destructuring	`const { name } = obj;`
Rename Variable	`const { name: userName } = obj;`
Default Values	`const { age = 25 } = obj;`
Nested Destructuring	`const { address: { city } } = obj;`
Function Args	`function({ name }) {}`
Rest Properties	`const { name, ...rest } = obj;`

Would you like a **quiz**, **practice examples**, or a **visual cheat sheet** on this topic?