

# JavaScript: Rest, Spread, Promises & Regular Expressions

## ■ Rest Operator

Rest operator (...) collects multiple items into one variable (array or object).

### ■ *Example with Functions:*

```
function sum(...numbers) { return numbers.reduce((total, n) => total + n, 0); }
console.log(sum(1, 2, 3, 4)); // 10
```

### ■ *Example with Objects (Destructuring):*

```
let person = { name: "Ali", age: 25, city: "Karachi" }; let { name, ...other } =
person; console.log(name); // Ali console.log(other); // { age: 25, city:
"Karachi" }
```

## ■ Spread Operator

Spread operator (...) expands values from an array or object.

### ■ *Example with Arrays:*

```
let arr1 = [1, 2]; let arr2 = [3, 4]; let combined = [...arr1, ...arr2];
console.log(combined); // [1, 2, 3, 4]
```

### ■ *Example with Functions:*

```
function greet(a, b, c) { console.log(a, b, c); } let args = ["Hello", "World",
"!"]; greet(...args); // Hello World !
```

### ■ *Example with Objects:*

```
let obj1 = { name: "John" }; let obj2 = { city: "Karachi" }; let user = { ...obj1,
...obj2 }; console.log(user); // { name: "John", city: "Karachi" }
```

## ■ Promises

A Promise is like a 'guarantee note' for an async task: it will either succeed (resolve) or fail (reject).

### ■ *Simple Promise Example:*

```
let myPromise = new Promise((resolve, reject) => { let success = true; if
(success) { resolve("■ Task Done"); } else { reject("■ Task Failed"); } });
myPromise .then(res => console.log(res)) .catch(err => console.log(err));
```

### ■ ***Promise with setTimeout:***

```
let promiseExample = new Promise((resolve) => { setTimeout(() => { resolve("■  
Data Loaded"); }, 2000); }); promiseExample.then(msg => console.log(msg));
```

## ■ **Regular Expressions (Regex)**

Regex is a pattern used to search or match text.

### ■ ***Example 1: Check if word exists:***

```
let regex = /cat/; console.log(regex.test("I have a cat")); // true  
console.log(regex.test("I have a dog")); // false
```

### ■ ***Example 2: Find digits:***

```
let regex = /\d+/; console.log("Age: 25".match(regex)); // ["25"]
```

### ■ ***Example 3: Simple Email Validation:***

```
let emailRegex = /^[\w.-]+@[\w.-]+\.\w+$/;  
console.log(emailRegex.test("test@example.com")); // true  
console.log(emailRegex.test("invalid@com")); // false
```