Lecture: JavaScript Basics

Variables: var, let, const

```
// var: redeclaration allowed
var name = "Shahid";
var name = "Gillani"; // No error
console.log(name); // "Gillani"

// let: cannot be redeclared in the same scope
let age = 25;
// let age = 30; ■ Error
age = 30; // ■ Reassignment allowed
console.log(age); // 30

// const: cannot be reassigned or redeclared
const country = "Pakistan";
// country = "USA"; ■ Error
console.log(country); // "Pakistan"
```

Data Types (Primitive vs Reference)

```
// Primitive
let x = 10;
let y = x;
y = 20;
console.log(x); // 10 (unchanged)

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

Operators (Arithmetic, Comparison, Logical)

```
// Arithmetic
console.log(10 + 5); // 15
console.log(10 % 3); // 1
console.log(2 ** 3); // 8

// Comparison
console.log(5 == "5");  // true (loose equality)
console.log(5 === "5"); // false (strict equality)
console.log(10 >= 7);   // true

// Logical
console.log(true && false); // false
console.log(true || false); // true
console.log(!true);         // false
```

Conditionals (if, switch)

```
// if...else
let score = 85;

if (score >= 90) {
  console.log("Grade: A");
} else if (score >= 75) {
  console.log("Grade: B");
} else {
  console.log("Grade: C");
}
// Output: "Grade: B"
// switch
```

```
let day = 3;

switch (day) {
  case 1:
    console.log("Monday");
    break;
  case 2:
    console.log("Tuesday");
    break;
  case 3:
    console.log("Wednesday");
    break;
  default:
    console.log("Invalid day");
}
// Output: "Wednesday"
```

Loops (for, while, for…of, for…in)

```
// for loop
for (let i = 1; i <= 3; i++) {
  console.log("Number:", i);
}
// Output: 1 2 3

// while loop
let count = 1;
while (count <= 3) {
  console.log("Count:", count);
  count++;
}

// for...of (arrays)
let fruits = ["Apple", "Banana", "Mango"];
for (let fruit of fruits) {
  console.log(fruit);
}

// for...in (objects)
let student = { name: "Ali", age: 21, grade: "A" };
for (let key in student) {
  console.log(key, ":", student[key]);
}
```