Class 2: Operators, Conditions, and Loops

Objective

- Learn how to use operators to perform computations and comparisons.
- Understand how to control the flow of a program using conditional statements.
- Gain hands-on experience with loops for repetitive tasks.

Content Outline

Operators (20 mins)

- **Types of Operators**:
  - Arithmetic: +, -, *, /, %
  - Assignment: =, +=, -=, *=, /=
  - Comparison: ==, !=, ===, !==, <, >, <=, >=
  - Logical: &&, ||, !

```
let a = 10;let b = 3;
console.log(a + b);  // Addition
console.log(a % b);  // Modulus
console.log(a > b);  // Greater than comparison
console.log(a === b); // Strict equality
console.log(!(a > b)); // Logical NOT
```

- **Quick Exercise**:
  - Compute the sum of two numbers, check if one number is greater than another, and use a logical operator to combine two conditions.

Conditional Statements (25 mins)

- **Topics**:
  - if, else if, else
  - switch statement (when to use it vs if-else)

```
let score = 85;
if (score >= 90) {
   console.log("Grade: A");
} else if (score >= 80) {
   console.log("Grade: B");
} else {
   console.log("Grade: C");
}
let color = "red";switch (color) {
```

```
    case "red":
      console.log("Stop!");
      break;
    case "yellow":
      console.log("Get ready!");
      break;
    case "green":
      console.log("Go!");
      break;
    default:
      console.log("Invalid color");
  }
```

- **Quick Exercise**:
  - Create a grading system with if-else statements.
  - Create a switch statement to print traffic light behavior for red, yellow, and green.

Loops (30 mins)

- **Topics**:
  - for loop
  - while loop
  - do...while loop

```
// for loopfor (let i = 1; i <= 5; i++) {
  console.log("Number: " + i);
}
// while looplet count = 0;while (count < 3) {
  console.log("Count is " + count);
  count++;
}
// do...while looplet number = 0;do {
  console.log("Number is " + number);
  number++;
} while (number < 2);
```

- **Quick Exercise**:
  - Print numbers from 1 to 10 using a for loop.
  - Use a while loop to count down from 5 to 1.
  - Use a do...while loop to print "Hello" three times.

Exercises: Calculator Program (15 mins)

- **Instructions**:
    - Write a program that:
        - Takes two numbers as variables.
        - Performs addition, subtraction, multiplication, and division.
        - Prints the results.

```
let num1 = 10;let num2 = 5;
console.log("Addition: " + (num1 + num2));console.log("Subtraction: " +
(num1 - num2));console.log("Multiplication: " + (num1 *
num2));console.log("Division: " + (num1 / num2));
```

Even/Odd Checker (10 mins)

- **Instructions**:
    - Write a program to check if a number is even or odd using if-else.

Solution

```
let number = 7;
if (number % 2 === 0) {
   console.log(number + " is even");
} else {
   console.log(number + " is odd");
}
```

Number Summation (15 mins)

- **Instructions**:
    - Use a for loop to calculate the sum of numbers from 1 to 10.

```
let sum = 0;for (let i = 1; i <= 10; i++) {
   sum += i;
}console.log("Sum of numbers from 1 to 10: " + sum);
```

FizzBuzz Program (20 mins)

- **Instructions**:
    - Write a program that prints numbers from 1 to 20.
    - For multiples of 3, print "Fizz" instead of the number.
    - For multiples of 5, print "Buzz".
    - For multiples of both 3 and 5, print "FizzBuzz".

```
for (let i = 1; i <= 20; i++) {
   if (i % 3 === 0 && i % 5 === 0) {
      console.log("FizzBuzz");
   } else if (i % 3 === 0) {
      console.log("Fizz");
   } else if (i % 5 === 0) {
      console.log("Buzz");
   } else {
      console.log(i);
   }
}
```

Summary (5 mins)

- Review how operators, conditions, and loops are used to control program flow.
- Highlight the importance of combining these concepts to build more complex logic.
- Assign a simple problem: *"Write a program that prints the first 10 multiples of a given number using a loop."*