Java Common Built-in Functions with Examples: Random, Math, and Utility Methods

Description:

In this material, we will explore some of Java's commonly used **built-in functions** provided by core classes like `Math`, `Random`, and other utility methods. Understanding these functions will help simplify coding tasks such as generating random numbers, performing mathematical calculations, and manipulating strings or arrays.

Topics Covered:

1. **Random Number Generation**:
   - Using `java.util.Random` and `Math.random()` to generate random numbers.
2. **Mathematical Functions**:
   - Utilizing `Math` class methods such as `Math.abs()`, `Math.pow()`, `Math.sqrt()`, etc.
3. **String Manipulation**:
   - Common string operations like `length()`, `substring()`, `toUpperCase()`, `toLowerCase()`.
4. **Array Utilities**:
   - Using `Arrays.toString()`, `Arrays.sort()`, and `Arrays.binarySearch()` from `java.util.Arrays`.

Task:

You will create separate functions to demonstrate the use of these built-in functions in real-world scenarios.

Example Program:

```
import java.util.Arrays;
import java.util.Random;

public class BuiltInFunctionsExample {

    // Function to generate random numbers
```

```
    public static void generateRandomNumbers() {
        Random random = new Random();
        System.out.println("Random number (0-99): " +
random.nextInt(100));

        // Using Math.random()
        double randomDouble = Math.random() * 100;
        System.out.println("Random double (0-100): " + (int)
randomDouble);
    }

    // Function demonstrating mathematical operations
    public static void performMathOperations() {
        int num = -25;
        System.out.println("Absolute value of " + num + ": " +
Math.abs(num));
        System.out.println("Square root of 25: " + Math.sqrt(25));
System.out.println("2 raised to the power of 3: " + Math.pow(2,
3));
    }

    // Function for array manipulation
    public static void manipulateArray() {
        int[] numbers = {5, 3, 8, 1, 2};
        System.out.println("Original Array: " +
Arrays.toString(numbers));

        Arrays.sort(numbers);
        System.out.println("Sorted Array: " +
Arrays.toString(numbers));

        int index = Arrays.binarySearch(numbers, 3);
        System.out.println("Index of 3 after sorting: " + index);
    }

    // Function for string manipulation
    public static void manipulateString() {
```

```
        String text = "hello World!";
        System.out.println("Original String: " + text);
        System.out.println("Uppercase: " + text.toUpperCase());
System.out.println("Lowercase: " + text.toLowerCase());
System.out.println("Substring (0-5): " + text.substring(0, 5));
    }

    public static void main(String[] args) {
        System.out.println("Random Numbers:");
        generateRandomNumbers();

        System.out.println("\nMath Operations:");
        performMathOperations();

        System.out.println("\nArray Manipulation:");
        manipulateArray();

        System.out.println("\nString Manipulation:");
        manipulateString();
    }
}
```