

Functions and Arrays in Java

Presented By:
Mirazul Islam
Java Instructor, EU

Functions in Java

A block of reusable code that performs a specific task.

Also called methods in Java.

Parameters:

Inputs passed to a function.

Can have zero or more parameters.

Return Types:

Specifies the type of value returned. Use void for no return.

Example:

```
public int add(int a, int b) {  
    return a + b;  
}
```

Built-in vs. User-defined Functions

❑ Built-in Functions:

Provided by Java libraries.

Example: `Math.sqrt(16)`

Example: `System.out.println("Hello")`

❑ User-defined Functions:

Created by the programmer.

Custom logic and reusability.

Arrays in Java

❑ Types of Arrays:

- i. Single-Dimensional: `int[] numbers = {1, 2, 3};`
- ii. Multi-Dimensional: `int[][] matrix = new int[3][3];`

Manipulation:

Access: `array[0]`

Update: `array[1] = 50;`

Loop through:

```
for(int i : array) {  
    System.out.println(i);  
}
```

Array Functions:

❑ **Arrays.sort(array)**

```
int[] arr = {4, 1, 2, 3};  
  
Arrays.sort(arr);  
  
System.out.println(Arrays.toString(arr));
```

❑ **Arrays.copyOf(array, newLength)**

```
int[] original = { 10, 20, 30, 40};  
  
int[] copy = Arrays.copyOf(original, 6);  
  
System.out.println(Arrays.toString(copy));
```

❑ **Arrays.toString(array)**

```
String[] names = {"Alice", "Bob", "Charlie"};  
  
System.out.println(Arrays.toString(names));
```

Problem Statement 1:

Write a program that accepts an array of integers from the user, then finds and prints the:

Minimum value in the array

Maximum value in the array

Average of all elements

Input:

Enter number of elements: 5

Enter 5 elements: 4 6 2 8 10

Output:

Minimum value: 2

Maximum value: 10

Average value: 6.00

Problem Statement 2:

- You are given grades in three subjects. Calculate the average grade and determine their final letter grade based on the following:

A: Average ≥ 90

B: Average ≥ 75

C: Average ≥ 60

F: Average < 60

Input:

85 90 80

Output:

Grade: B

Problem Statement 3:

Write a Java program that prints a right-angled triangle made of * characters.

The triangle should have n rows, where the first row contains 1 star, the second row contains 2 stars, and so on.

Input:

5

Output:

*

**
