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Intelligent Medical System Department

جامعة المستقبل
AL MUSTAQBAL UNIVERSITY

كلية العلوم

قسم الانظمة الطبية الذكية

Lecture: (5)

String Part I

Subject: Computer Programming II
Level: First
Lecturer: Dr. Maytham N. Meqdad

String Part I

1. Strings

In **Java**, a **String** is an object that represents a sequence of characters, such as:

```
"Hello"
"Java Programming"
"12345"
```

- Strings are enclosed within double quotes " ".
- A String in Java is **immutable**, meaning its value cannot be changed after creation.

🔹 2. Declaring Strings

There are two common ways to declare a String in Java:

✔ **Method 1 (Recommended):**

```
String name = "Ali";
```

✔ **Method 2 (Using new keyword):**

```
String name = new String("Ali");
```

🔸 **Difference:**

- The first method stores the string in the **String Pool** (more efficient).
- The second method creates a new object in memory.

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3. String Representation

Internally, a String in Java is represented as a sequence (array) of characters.

Example:

```
String word = "Java";
```

It can be visualized as:

```
J   a   v   a
0   1   2   3   ← index
```

- You can access individual characters using:

```
char ch = word.charAt(0); // J
```

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4. Reading a String from the Console

To read a String from the user, we use the **Scanner** class:

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print("Enter your name: ");
        String name = input.nextLine();

        System.out.println("Hello " + name);
    }
}
```

- **Note:**

  - `next()` → reads a single word

- `nextLine()` → reads a full line (sentence)

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5. String Concatenation

Concatenation means **combining strings together**.

✔ **Using (+) operator:**

```
String firstName = "Ali";
String lastName = "Hassan";

String fullName = firstName + " " + lastName;
System.out.println(fullName);
```

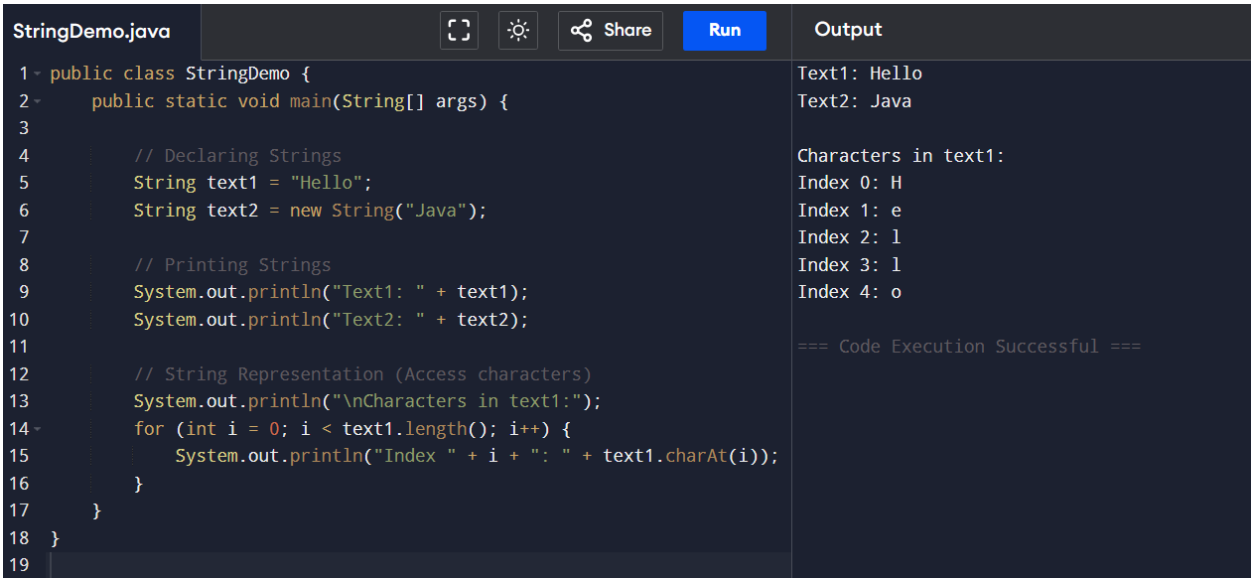
✔ **Using concat() method:**

```
String text1 = "Hello ";
String text2 = "World";

String result = text1.concat(text2);
System.out.println(result);
```

Program 1: String Declaration and Representation

- **Explains the definition of texts and character access**

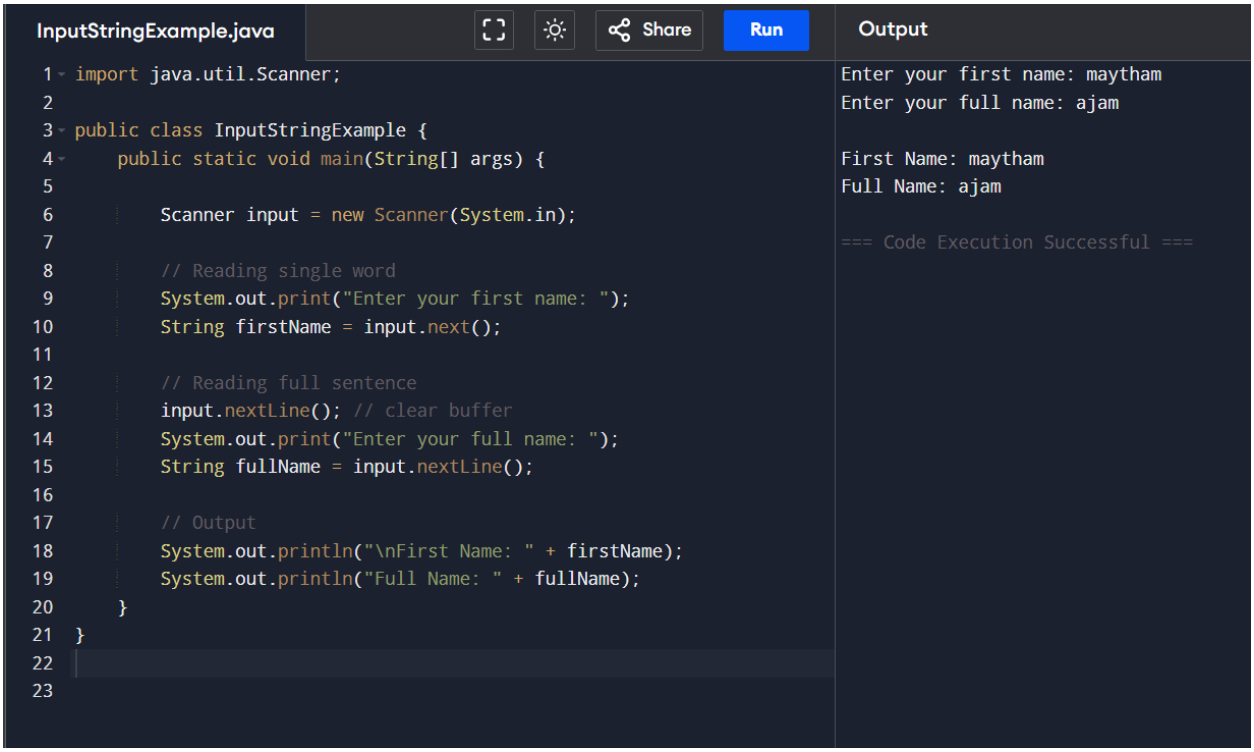
```
public class StringDemo {
    public static void main(String[] args) {

        // Declaring Strings
        String text1 = "Hello";
        String text2 = new String("Java");

        // Printing Strings
        System.out.println("Text1: " + text1);
        System.out.println("Text2: " + text2);

        // String Representation (Access characters)
        System.out.println("\nCharacters in text1:");
        for (int i = 0; i < text1.length(); i++) {
            System.out.println("Index " + i + ": " + text1.charAt(i));
        }
    }
}
```



Program 2: Reading String from Console

User text input is shown

```
import java.util.Scanner;

public class InputStringExample {
    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        // Reading single word
        System.out.print("Enter your first name: ");
        String firstName = input.next();

        // Reading full sentence
        input.nextLine(); // clear buffer
        System.out.print("Enter your full name: ");
        String fullName = input.nextLine();

        // Output
        System.out.println("\nFirst Name: " + firstName);
        System.out.println("Full Name: " + fullName);
    }
}
```



Program 3: String Concatenation

- **Explains how to merge texts in different ways**

```
public class ConcatenationExample {
    public static void main(String[] args) {

        String firstName = "Ali";
        String lastName = "Hassan";

        // Using + operator
        String fullName1 = firstName + " " + lastName;

        // Using concat() method
        String fullName2 = firstName.concat(" ").concat(lastName);

        // Combining numbers and strings
        int age = 25;
        String info = "Name: " + fullName1 + ", Age: " + age;

        // Output
        System.out.println("Using + : " + fullName1);
        System.out.println("Using concat(): " + fullName2);
        System.out.println(info);
    }
}
```