

## Lab 2 Exercises CS110: Programming Language I -

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### Exercise 1: My First Program

**Task:** Write, compile, and run a Java program that displays the following three messages on the screen:

Welcome to CS110.

Java is fun!

Let's practice programming.

**Solution Code:**

```
public class Exercise1 {  
    public static void main(String[] args) {  
        System.out.println("Welcome to CS110.");  
        System.out.println("Java is fun!");  
        System.out.println("Let's practice programming.");  
    }  
}
```

**Output:**

Welcome to CS110.

Java is fun!

Let's practice programming.

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## Exercise 2: Using print vs. println

**Task:** Write a program that produces the following output using only two print statements and one println statement.

Hello World! This is a single line  
made with multiple print statements.

### Solution Code:

java

```
public class Exercise2 {  
    public static void main(String[] args) {  
        System.out.print("Hello World! This is a single line\n");  
        System.out.print("made with multiple print statements.");  
    }  
}
```

### Output:

text

Hello World! This is a single line  
made with multiple print statements.

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### Exercise 3: Variable Declaration and Assignment

**Task:** Write a program that declares variables of different types, assigns values to them, and prints them.

#### Solution Code:

```
public class Exercise3 {  
    public static void main(String[] args) {  
        // Variable declaration and assignment  
        int studentId = 1234567;  
        double temperature = 28.5;  
        char grade = 'A';  
        String firstName = "Alice";  
        boolean isJavaFun = true;  
  
        // Printing each variable with a descriptive message  
        System.out.println("Student ID: " + studentId);  
        System.out.println("Temperature: " + temperature);  
        System.out.println("Grade: " + grade);  
        System.out.println("First Name: " + firstName);  
        System.out.println("Is Java Fun? " + isJavaFun);  
    }  
}
```

#### Output:

Student ID: 1234567

Temperature: 28.5

Grade: A

First Name: Alice

Is Java Fun? true

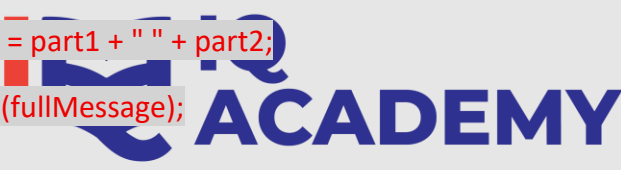
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#### Exercise 4: String Concatenation

**Task:** Write a program that demonstrates string concatenation.

**Solution Code:**

```
public class Exercise4 {  
    public static void main(String[] args) {  
        // Declare two String variables  
        String part1 = "Java";  
        String part2 = "Programming";  
  
        // Concatenate them with a space  
        String fullMessage = part1 + " " + part2;  
        System.out.println(fullMessage);  
  
        // Demonstrate concatenation with numbers  
        System.out.println("The result of 10 + 20 is " + (10 + 20));  
    }  
}
```



**Output:**

Java Programming

The result of 10 + 20 is 30


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## Exercise 5: Constants and the final Keyword

**Task:** Write a program to calculate the area of a circle.

**Solution Code:**

```
public class Exercise5 {  
    public static void main(String[] args) {  
        // Declare a constant for PI  
        final double PI = 3.14159;  
  
        // Declare and initialize radius  
        double radius = 5.0;  
  
        // Calculate area  
        double area = PI * radius * radius;  
  
        // Display results with formatting  
        System.out.printf("For a radius of %.2f, the area is %.2f.", radius, area);  
    }  
}
```

The logo for IQ Academy features the letters 'IQ' in a large, blue, sans-serif font. Below the 'Q' is a stylized blue icon of an open book. To the right of the book icon, the word 'ACADEMY' is written in a smaller, blue, sans-serif font.

**Output:**

For a radius of 5.00, the area is 78.54.

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## Exercise 6: Explicit Type Casting

**Task:** Write a program to demonstrate explicit type casting.

**Solution Code:**

```
public class Exercise6 {  
    public static void main(String[] args) {  
        // Part 1: Casting double to int  
        double myDouble = 9.78;  
        int myInt = (int) myDouble; // Explicit casting  
  
        System.out.println("Original double value: " + myDouble);  
        System.out.println("Casted int value: " + myInt);  
        // The decimal part (.78) is truncated (removed) when casting to int  
  
        // Part 2: Calculating average  
        // Regular average as double  
        double averageDouble = (7 + 8) / 2.0;  
        System.out.println("Average as double: " + averageDouble);  
        // Truncated average as integer  
        int averageInt = (int) ((7 + 8) / 2.0);  
        System.out.println("Truncated average as int: " + averageInt);  
    }  
}
```

**Output:**

Original double value: 9.78

Casted int value: 9

Average as double: 7.5

Truncated average as int: 7