Java Programming Lab Handout

This lab handout contains all Java programs for the six learning outcomes. Each section includes topic references, step-by-step tasks, full commented code, and expected output.

1. Understand Programming Concepts

Task: Hello World Program Step 1: Open any text editor or IDE. Step 2: Type the code below and save as HelloWorld.java Step 3: Compile with: javac HelloWorld.java Step 4: Run with: java HelloWorld

```
public class HelloWorld {
    public static void main(String[] args) {
        // This prints a message to the screen
        System.out.println("Hello, World!");
    }
}
```

Expected Output: Hello, World!

2. Understand the Java Environment

Task: Setup JDK & IDE and run a simple program in Eclipse.

```
public class TestSetup {
    public static void main(String[] args) {
        System.out.println("Java setup successful");
    }
}
```

Expected Output: Java setup successful

3. Perform Data Operations

Task: Work with variables and perform arithmetic.

```
public class DataTypesDemo {
    public static void main(String[] args) {
        int age = 20;
        float price = 99.5f;
        String name = "Alice";
        boolean isStudent = true;

        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
        System.out.println("Price: " + price);
        System.out.println("Student? " + isStudent);
    }
}
```

Expected Output: Name: Alice Age: 20 Price: 99.5 Student? true

4. Use Control Structures

Task: Write a program with if-else and loops.

```
public class LoopDemo {
    public static void main(String[] args) {
        for (int i = 1; i <= 5; i++) {
            System.out.println("Count: " + i);
        }
    }
}
```

Expected Output: Count: 1 Count: 2 Count: 3 Count: 4 Count: 5

5. Use Methods

Task: Write a method that returns the square of a number.

```
public class MethodDemo {
    static int square(int num) {
        return num * num;
    }
    public static void main(String[] args) {
        int result = square(4);
        System.out.println("Square = " + result);
    }
}
```

Expected Output: Square = 16

6. Understand OOP

Task: Demonstrate inheritance.

```
class Animal {
    void eat() {
        System.out.println("Animal eats");
    }
}

class Dog extends Animal {
    void bark() {
        System.out.println("Dog barks");
    }
}

public class InheritanceDemo {
    public static void main(String[] args) {
        Dog d = new Dog();
        d.eat();
        d.bark();
    }
}
```

Expected Output: Animal eats Dog barks