Variables

Challenge 1: Swap two numbers using a temporary variable

```java
public class SwapWithTemp {
    public static void main(String[] args) {
        int a = 5, b = 10;
        System.out.println("Before Swap: a = " + a + ", b = " + b);
        int temp = a;
        a = b;
        b = temp;
        System.out.println("After Swap: a = " + a + ", b = " + b);
    }
}
```

Output:
Before Swap: a = 5, b = 10
After Swap: a = 10, b = 5

Challenge 2: Swap two numbers without a temporary variable

```java
public class SwapWithoutTemp {
    public static void main(String[] args) {
        int a = 5, b = 10;
        System.out.println("Before Swap: a = " + a + ", b = " + b);
        a = a + b;
        b = a - b;
        a = a - b;
        System.out.println("After Swap: a = " + a + ", b = " + b);
    }
}
```

Output:
Before Swap: a = 5, b = 10
After Swap: a = 10, b = 5

Challenge 3: Demonstrate variable shadowing within a class and method

```
public class VariableShadowing {
    int x = 50;

    public void show() {
        int x = 100;
        System.out.println("Local x: " + x);
        System.out.println("Instance x: " + this.x);
    }

    public static void main(String[] args) {
        VariableShadowing obj = new VariableShadowing();
        obj.show();
    }
}
```

Output:
Local x: 100
Instance x: 50

Challenge 4: Declare a constant and use it in calculations

```
public class ConstantExample {
    public static void main(String[] args) {
        final double PI = 3.14159;
        int radius = 5;
        double area = PI * radius * radius;
        System.out.println("Area of circle: " + area);
    }
}
```

Output:
Area of circle: 78.53975

Challenge 5: Demonstrate instance, static, and local variables

```java
public class VariableScope {
    int instanceVar = 10;
    static int staticVar = 20;

    public void method() {
        int localVar = 30;
        System.out.println("Instance variable: " + instanceVar);
        System.out.println("Static variable: " + staticVar);
        System.out.println("Local variable: " + localVar);
    }

    public static void main(String[] args) {
        VariableScope obj = new VariableScope();
        obj.method();
    }
}
```

Output:
Instance variable: 10
Static variable: 20
Local variable: 30