Exercise 1: Implement a Functional Interface

Objective: Create a functional interface and use a lambda expression to implement it.

Define a Functional Interface:

Create a functional interface named StringOperation with a single abstract method String operate(String s).

Use Lambda Expression:

Write a lambda expression that implements StringOperation, which reverses the input string.

Test Your Lambda Expression:

Create a method String applyOperation(String s, StringOperation operation) which applies the operation to the given string.

Test the lambda expression by passing a string to applyOperation.

Exercise 2 : Simple Arithmetic Operations

Objective: Create functional interfaces for basic arithmetic operations and implement them using lambda expressions.

Define Functional Interfaces:

Create a functional interface ArithmeticOperation with a method double operate(double a, double b) for operations like addition, subtraction, multiplication, and division.

Implement Using Lambda Expressions:

Write lambda expressions for each arithmetic operation.

Example for addition: (a, b) -> a + b

Test Your Implementations:

Create a method to test each operation, like performOperation(double a, double b, ArithmeticOperation operation).

Test addition, subtraction, multiplication, and division using your lambda expressions.

Exercise 2: String Manipulation

Objective: Use lambda expressions for various string manipulation tasks.

String Transformation:

Define a functional interface StringTransform with a method String transform(String s).

Implement a lambda expression to convert a string to uppercase.

Implement another lambda to reverse a string.

String Testing:

Define a functional interface StringTest with a method boolean test(String s).

Implement a lambda to check if a string is a palindrome.

Implement another lambda to check if a string contains a specific character.

Exercise 3: Custom Logger

Objective: Create a simple logger using a functional interface.

Define a Logger Interface:

Create a functional interface Logger with a method void log(String message).

Implement Different Log Levels:

Write lambda expressions for different logging levels (e.g., INFO, DEBUG, ERROR) which prepend the log level to the message.

Test Your Logger:

Create a method to log messages at different levels using your lambda expressions.
