**Exercise 1: Implementing the Singleton Pattern**

**1. Logger.java**

public class Logger {

private static Logger instance;

private Logger() {

System.out.println("Logger initialized.");

}

public static Logger getInstance() {

if (instance == null) {

instance = new Logger();

}

return instance;

}

public void log(String message) {

System.out.println("[LOG]: " + message);

}

}

**2. TestLogger.java (Main)**

public class TestLogger {

public static void main(String[] args) {

Logger logger1 = Logger.getInstance();

logger1.log("Application started.");

Logger logger2 = Logger.getInstance();

logger2.log("Processing data...");

if (logger1 == logger2) {

System.out.println("Singleton confirmed: Only one Logger instance is used.");

} else {

System.out.println("Error: Multiple Logger instances exist.");

}

}

}

Output:

