**Exercise 1: Implementing the Singleton Pattern**

Logger Class 🡪

public class Logger {

private static Logger instance;

private Logger() {

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

}

public static Logger getInstance() {

if (instance == null) {

synchronized (Logger.class) {

if (instance == null) {

instance = new Logger();

}

}

}

return instance;

}

public void log(String message) {

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

}

}

Main Class (Test class) 🡪

public class Main {

public static void main(String[] args) {

Logger log1 = Logger.getInstance();

Logger log2 = Logger.getInstance();

log1.log("First message");

log2.log("Second message");

System.out.println("Same instance? " + (log1 == log2));

}

}

Output 🡪

