**Exercise 1: Implementing the Singleton Pattern**

package LoggerExample;

public class Logger

{

private static Logger instance;

private Logger() {

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

}

public static Logger getInstance() {

if (instance == null) {

instance = new Logger(); // lazy initialization

}

return instance;

}

public void log(String message) {

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

}

}

package LoggerExample;

public class Main

{

public static void main(String[] args) {

Logger logger1 = Logger.getInstance();

logger1.log("This is the first log.");

Logger logger2 = Logger.getInstance();

logger2.log("This is the second log.");

if (logger1 == logger2) {

System.out.println("Both logger instances are the same.");

} else {

System.out.println("Different logger instances exist!");

}

}

}

Output:

