**Exercise 1: Implementing the Singleton Pattern**

**Logger.java**

**(Singleton Class implementation)**

public class Logger {

private static Logger instance;

private Logger() {

System.out.println("Logger instance created.");

}

public static Logger getInstance() {

if (instance == null) {

instance = new Logger();

}

return instance;

}

public void log(String message) {

System.out.println("Log message: " + message);

}

}

**TestLogger.java**

**(Test class to verify Singleton behavior)**

public class TestLogger {

public static void main(String[] args) {

Logger logger1 = Logger.getInstance();

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

Logger logger2 = Logger.getInstance();

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

if (logger1 == logger2) {

System.out.println("Both logger1 and logger2 are the same instance.");

}

else {

System.out.println("Different instances exist. Singleton failed.");

}

}

}

**OUTPUT:**

