**Exercise 1: Implementing the Singleton Pattern**

**CODE :**

**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);

    }

}

**LoggerTest.java**

public class LoggerTest {

    public static void main(String[] args) {

        Logger logger1 = Logger.getInstance();

        logger1.log("1st log message.");

        Logger logger2 = Logger.getInstance();

        logger2.log("2nd log message.");

        if (logger1 == logger2) {

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

        } else {

            System.out.println("Different instances detected.");

        }

    }

}

**OUTPUT :**

