**Exercise 1: Implementing the Singleton Pattern**

**Source Code :**

public class SingletonPatternExample {

public static void main(String[] args) {

Logger logger1 = Logger.getInstance();

logger1.log("Starting application...");

Logger logger2 = Logger.getInstance();

logger2.log("Processing user request...");

if (logger1 == logger2) {

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

} else {

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

}

}

}

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);

}

}

**Output :**

