**Exercise 1: Implementing the Singleton Pattern**

package com.example;

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);

}

}

package com.example;

public class Main {

public static void main(String[] args) {

Logger logger1 = Logger.getInstance();

logger1.log("First message");

Logger logger2 = Logger.getInstance();

logger2.log("Second message");

if (logger1 == logger2) {

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

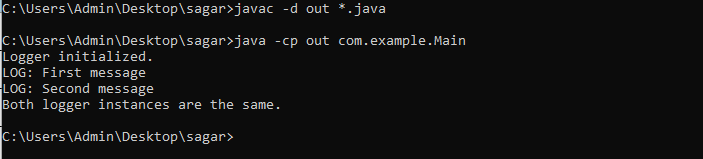
} else {

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

}

}

}

**Output**

**Exercise 2: Implementing the Factory Method Pattern**public class TestFactoryPattern {

static abstract class Document {

public abstract void open();

}

static class WordDocument extends Document {

public void open() {

System.out.println("Opening Word Document...");

}

}

static class PdfDocument extends Document {

public void open() {

System.out.println("Opening PDF Document...");

}

}

static class ExcelDocument extends Document {

public void open() {

System.out.println("Opening Excel Document...");

}

}

static abstract class DocumentFactory {

public abstract Document createDocument();

}

static class WordDocumentFactory extends DocumentFactory {

public Document createDocument() {

return new WordDocument();

}

}

static class PdfDocumentFactory extends DocumentFactory {

public Document createDocument() {

return new PdfDocument();

}

}

static class ExcelDocumentFactory extends DocumentFactory {

public Document createDocument() {

return new ExcelDocument();

}

}

public static void main(String[] args) {

DocumentFactory factory;

factory = new WordDocumentFactory();

Document doc1 = factory.createDocument();

doc1.open();

factory = new PdfDocumentFactory();

Document doc2 = factory.createDocument();

doc2.open();

factory = new ExcelDocumentFactory();

Document doc3 = factory.createDocument();

doc3.open();

}

}

**Output**

