**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);

}

}

**Main.java**

public class Main {

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 logger instances are the same.");

} else {

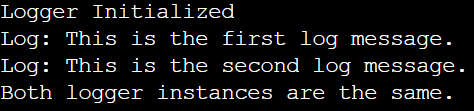
System.out.println("Different logger instances exist.");

}

}

}

**Output:**

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**Exercise 2: Implementing the Factory Method Pattern**

**Code:**

**Document.java**

public interface Document {

void open();

}

**WordDocument.java**

public class WordDocument implements Document {

public void open() {

System.out.println("Opening a Word document.");

}

}

**PdfDocument.java**

public class PdfDocument implements Document {

public void open() {

System.out.println("Opening a PDF document.");

}

}

**ExcelDocument.java**

public class ExcelDocument implements Document {

public void open() {

System.out.println("Opening an Excel document.");

}

}

**DocumentFactory.java**

public abstract class DocumentFactory {

public abstract Document createDocument();

}

**WordFactory.java**

public class WordFactory extends DocumentFactory {

public Document createDocument() {

return new WordDocument();

}

}

**PdfFactory.java**

public class PdfFactory extends DocumentFactory {

public Document createDocument() {

return new PdfDocument();

}

}

**ExcelFactory.java**

public class ExcelFactory extends DocumentFactory {

public Document createDocument() {

return new ExcelDocument();

}

}

**Main.java**

public class Main {

public static void main(String[] args) {

DocumentFactory wordFactory = new WordFactory();

Document wordDoc = wordFactory.createDocument();

wordDoc.open();

DocumentFactory pdfFactory = new PdfFactory();

Document pdfDoc = pdfFactory.createDocument();

pdfDoc.open();

DocumentFactory excelFactory = new ExcelFactory();

Document excelDoc = excelFactory.createDocument();

excelDoc.open();

}

}

**Output:**

