**WEEK – 1 : DESIGN PRINCIPLES AND PATTERN**

**EXERCISE 1 : IMPLEMENTING THE SINGLETON PATTERN**

**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);

}

}

**TestLogger.java:**

public class TestLogger {

public static void main(String[] args) {

Logger logger1 = Logger.getInstance();

Logger logger2 = Logger.getInstance();

logger1.log("Message: Logger 1");

logger2.log("Message: Logger 2");

if (logger1 == logger2) {

System.out.println("Only one instance of Logger exists");

} else {

System.out.println("Multiple instances of Logger exist");

}

}

}

**OUTPUT:**

A computer screen with white text

AI-generated content may be incorrect.

**EXERCISE 2: IMPLEMENTING THE FACTORY METHOD PATTERN**

**Document.java:**

public interface Document {

void open();

}

**WordDocument.java:**

public class WordDocument implements Document {

public void open() {

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

}

}

**WordDocumentFactory.java:**

public class WordDocumentFactory extends DocumentFactory {

public Document createDocument() {

return new WordDocument();

}

}

**PdfDocument.java:**

public class PdfDocument implements Document {

public void open() {

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

}

}

**PdfDocumentFactory.java:**

public class PdfDocumentFactory extends DocumentFactory {

public Document createDocument() {

return new PdfDocument();

}

}

**ExcelDocument.java:**

public class ExcelDocument implements Document {

public void open() {

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

}

}

**ExcelDocumentFactory.java:**

public class ExcelDocumentFactory extends DocumentFactory {

public Document createDocument() {

return new ExcelDocument();

}

}

**DocumentFactory.java:**

public abstract class DocumentFactory {

public abstract Document createDocument();

}

**DocumentFactoryTest.java:**

public class DocumentTest {

public static void main(String[] args) {

DocumentFactory wordFactory = new WordDocumentFactory();

Document word = wordFactory.createDocument();

word.open();

DocumentFactory pdfFactory = new PdfDocumentFactory();

Document pdf = pdfFactory.createDocument();

pdf.open();

DocumentFactory excelFactory = new ExcelDocumentFactory();

Document excel = excelFactory.createDocument();

excel.open();

}

}

**OUTPUT:**

A computer screen shot of a black screen

AI-generated content may be incorrect.