Exercise 1: Implementing the Singleton Pattern

Code:

public class SingletonPatternExample {

static class Logger {

private static Logger instance;

private Logger() {

System.out.println("Logger instance created.");

}

public static Logger getInstance() {

if (instance == null) {

instance = new Logger();

}

return instance;

}

public void log(String message) {

System.out.println("Log: " + message);

}

}

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 logger1 and logger2 refer to the same instance.");

} else {

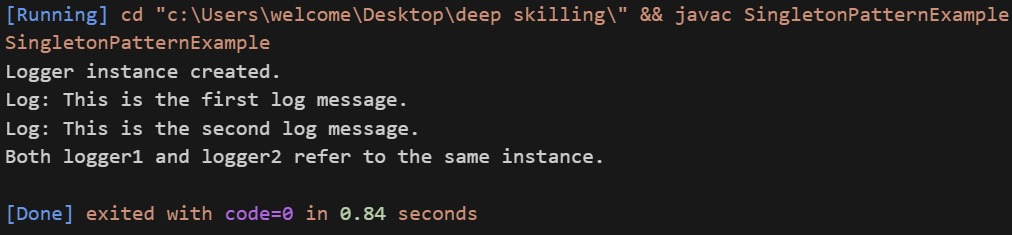
System.out.println("Different instances exist!");

}

}

}

Output:



Exercise 2: Implementing the Factory Method Pattern

Code:

public class FactoryMethodPatternExample {

interface Document {

void open();

}

static class WordDocument implements Document {

public void open() {

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

}

}

static class PdfDocument implements Document {

public void open() {

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

}

}

static class ExcelDocument implements Document {

public void open() {

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

}

}

abstract static 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 wordFactory = new WordDocumentFactory();

Document wordDoc = wordFactory.createDocument();

wordDoc.open();

DocumentFactory pdfFactory = new PdfDocumentFactory();

Document pdfDoc = pdfFactory.createDocument();

pdfDoc.open();

DocumentFactory excelFactory = new ExcelDocumentFactory();

Document excelDoc = excelFactory.createDocument();

excelDoc.open();

}

}

Output:

