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

**Scenario:**

You are developing a document management system that needs to create different types of documents (e.g., Word, PDF, Excel). Use the Factory Method Pattern to achieve this.

**Steps:**

1. **Create a New Java Project:**
   * Create a new Java project named **FactoryMethodPatternExample**.
2. **Define Document Classes:**
   * Create interfaces or abstract classes for different document types such as **WordDocument**, **PdfDocument**, and **ExcelDocument**.
3. **Create Concrete Document Classes:**
   * Implement concrete classes for each document type that implements or extends the above interfaces or abstract classes.
4. **Implement the Factory Method:**
   * Create an abstract class **DocumentFactory** with a method **createDocument()**.
   * Create concrete factory classes for each document type that extends DocumentFactory and implements the **createDocument()** method.
5. **Test the Factory Method Implementation:**
   * Create a test class to demonstrate the creation of different document types using the factory method.

**Solution:**

public class FactoryMethodPatternExample {

// Define abstract document classes

static abstract class WordDocument {

abstract void open();

}

static abstract class PdfDocument {

abstract void open();

}

static abstract class ExcelDocument {

abstract void open();

}

// Concrete implementations of each document type

static class MyWordDocument extends WordDocument {

void open() {

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

}

}

static class MyPdfDocument extends PdfDocument {

void open() {

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

}

}

static class MyExcelDocument extends ExcelDocument {

void open() {

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

}

}

//Abstract factory class

static abstract class DocumentFactory {

abstract Object createDocument();

}

static class WordFactory extends DocumentFactory {

Object createDocument() {

return new MyWordDocument();

}

}

static class PdfFactory extends DocumentFactory {

Object createDocument() {

return new MyPdfDocument();

}

}

static class ExcelFactory extends DocumentFactory {

Object createDocument() {

return new MyExcelDocument();

}

}

//testing

public static void main(String[] args) {

WordFactory wordFactory = new WordFactory();

WordDocument wordDoc = (WordDocument) wordFactory.createDocument();

wordDoc.open();

PdfFactory pdfFactory = new PdfFactory();

PdfDocument pdfDoc = (PdfDocument) pdfFactory.createDocument();

pdfDoc.open();

ExcelFactory excelFactory = new ExcelFactory();

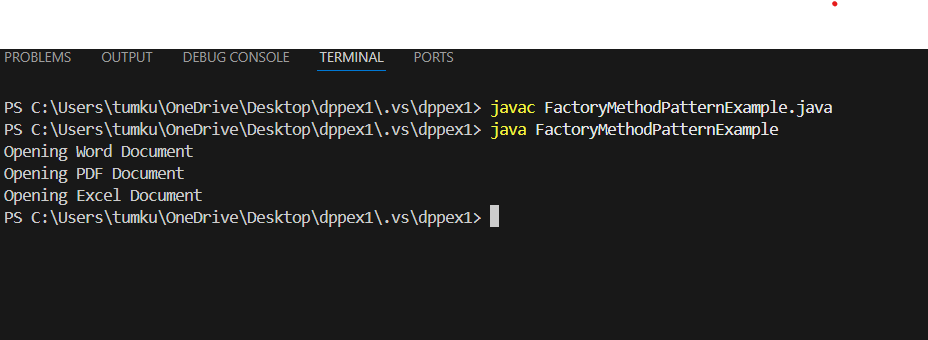
ExcelDocument excelDoc = (ExcelDocument) excelFactory.createDocument();

excelDoc.open();

}

}

**Output:**

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