**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.

**Code**:

package FactoryMethodPatternExample;

// Abstract Document class

abstract class Document {

public abstract void open();

public abstract void close();

public abstract void save();

}

// Concrete Document classes

class WordDocument extends Document {

@Override

public void open() {

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

}

@Override

public void close() {

System.out.println("Closing Word document...");

}

@Override

public void save() {

System.out.println("Saving Word document...");

}

}

class PdfDocument extends Document {

@Override

public void open() {

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

}

@Override

public void close() {

System.out.println("Closing PDF document...");

}

@Override

public void save() {

System.out.println("Saving PDF document...");

}

}

class ExcelDocument extends Document {

@Override

public void open() {

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

}

@Override

public void close() {

System.out.println("Closing Excel document...");

}

@Override

public void save() {

System.out.println("Saving Excel document...");

}

}

// Abstract DocumentFactory class

abstract class DocumentFactory {

public abstract Document createDocument();

}

// Concrete DocumentFactory classes

class WordDocumentFactory extends DocumentFactory {

@Override

public Document createDocument() {

return new WordDocument();

}

}

class PdfDocumentFactory extends DocumentFactory {

@Override

public Document createDocument() {

return new PdfDocument();

}

}

class ExcelDocumentFactory extends DocumentFactory {

@Override

public Document createDocument() {

return new ExcelDocument();

}

}

// Main class to test the Factory Method implementation

public class FactoryMethodPatternExample {

public static void main(String[] args) {

DocumentFactory wordFactory = new WordDocumentFactory();

Document wordDoc = wordFactory.createDocument();

wordDoc.open();

wordDoc.save();

wordDoc.close();

DocumentFactory pdfFactory = new PdfDocumentFactory();

Document pdfDoc = pdfFactory.createDocument();

pdfDoc.open();

pdfDoc.save();

pdfDoc.close();

DocumentFactory excelFactory = new ExcelDocumentFactory();

Document excelDoc = excelFactory.createDocument();

excelDoc.open();

excelDoc.save();

excelDoc.close();

}

}