**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.

**Document.java**

package factorymethod;

public interface Document {

void open();

}

**WordDocument.java**

package factorymethod;

public class WordDocument implements Document {

@Override

public void open() {

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

}

}

**PdfDocument.java**

package factorymethod;

public class PdfDocument implements Document {

@Override

public void open() {

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

}

}

**ExcelDocument.java**

package factorymethod;

public class ExcelDocument implements Document {

@Override

public void open() {

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

}

}

**DocumentFactory.java**

package factorymethod;

public abstract class DocumentFactory {

public abstract Document createDocument();

}

**WordDocumentFactory.java**

package factorymethod;

public class WordDocumentFactory extends DocumentFactory {

@Override

public Document createDocument() {

return new WordDocument();

}

}

**PdfDocumentFactory.java**

package factorymethod;

public class PdfDocumentFactory extends DocumentFactory {

@Override

public Document createDocument() {

return new PdfDocument();

}

}

**ExcelDocumentFactory.java**

package factorymethod;

public class ExcelDocumentFactory extends DocumentFactory {

@Override

public Document createDocument() {

return new ExcelDocument();

}

}

**TestDocumentFactory.java**

package factorymethod;

public class TestDocumentFactory {

public static void main(String[] args) {

// Create a Word document

DocumentFactory wordFactory = new WordDocumentFactory();

Document wordDoc = wordFactory.createDocument();

wordDoc.open();

// Create a PDF document

DocumentFactory pdfFactory = new PdfDocumentFactory();

Document pdfDoc = pdfFactory.createDocument();

pdfDoc.open();

// Create an Excel document

DocumentFactory excelFactory = new ExcelDocumentFactory();

Document excelDoc = excelFactory.createDocument();

excelDoc.open();

}

}

**Output:**

Opening a Word document.

Opening a PDF document.

Opening an Excel document.