**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.

Answer:

Document.java:

**package** factorydesign;

**public** **interface** Document {

**void** open();

**void** save();

}

**abstract** **class** DocumentFactory{

**public** **abstract** Document create();

**public** **void** process() {

Document doc=create();

doc.open();

doc.save();

System.***out***.println("complete");

}

}

WordDoc.java:

**package** factorydesign;

**public** **class** WordDoc **implements** Document {

@Override

**public** **void** open() {

System.***out***.println("open word");

}

@Override

**public** **void** save() {

System.***out***.println("save word");

}

}

**class** wordFactory **extends** DocumentFactory{

@Override

**public** Document create() {

**return** **new** WordDoc();

}

}

Pdf.java:

**package** factorydesign;

**public** **class** pdf **implements** Document {

@Override

**public** **void** open() {

System.***out***.println("open pdf");

}

@Override

**public** **void** save() {

System.***out***.println("save pdf");

}

}

**class** pdfFactory **extends** DocumentFactory{

@Override

**public** Document create() {

**return** **new** pdf();

}

}

Excel.java:

**package** factorydesign;

**public** **class** excel **implements** Document {

@Override

**public** **void** open() {

System.***out***.println("open excel");

}

@Override

**public** **void** save() {

System.***out***.println("save excel");

}

}

**class** excelFactory **extends** DocumentFactory{

@Override

**public** Document create() {

**return** **new** excel();

}

}

FactoryMethodPattern.java:

**package** factorydesign;

**public** **class** FactoryMethodPattern {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

System.***out***.println("Word:");

DocumentFactory wf=**new** wordFactory();

wf.process();

System.***out***.println("pdf:");

DocumentFactory pdff=**new** pdfFactory();

pdff.process();

System.***out***.println("Excel:");

DocumentFactory ef=**new** excelFactory();

ef.process();

}

}

Output Screenshot:

