**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.

The **Factory Pattern** is a **creational design pattern** that provides an interface for creating objects in a superclass but allows subclasses to alter the type of objects that will be created.

**Implementation:**

// Document.java

package Exercise2;

public interface Document {

void open();

}

// WordDocument.java

package Exercise2;

public class WordDocument implements Document {

public void open() {

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

}

}

// PdfDocument.java

package Exercise2;

public class PdfDocument implements Document {

public void open() {

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

}

}

// ExcelDocument.java

package Exercise2;

public class ExcelDocument implements Document {

public void open() {

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

}

}

// DocumentFactory.java

package Exercise2;

public abstract class DocumentFactory {

public abstract Document createDocument();

}

// WordFactory.java

package Exercise2;

public class WordFactory extends DocumentFactory {

public Document createDocument() {

return new WordDocument();

}

}

// PdfFactory.java

package Exercise2;

public class PdfFactory extends DocumentFactory {

public Document createDocument() {

return new PdfDocument();

}

}

// ExcelFactory.java

package Exercise2;

public class ExcelFactory extends DocumentFactory {

public Document createDocument() {

return new ExcelDocument();

}

}

🔹 Step 5: Test the Factory Method

// TestFactory.java

package Exercise2;

public class TestFactory {

public static void main(String[] args) {

DocumentFactory wordFactory = new WordFactory();

Document word = wordFactory.createDocument();

word.open();

DocumentFactory pdfFactory = new PdfFactory();

Document pdf = pdfFactory.createDocument();

pdf.open();

DocumentFactory excelFactory = new ExcelFactory();

Document excel = excelFactory.createDocument();

excel.open();

}

}

Output:

