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**DN-4.0 - Java FSE - Deep Skilling**

**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:** o 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:**

**Document.java**

package factory;

public interface Document {

void open();

}

**WordDocument.java**

package factory; public class WordDocument implements Document {

public void open() {

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

}

}

**PdfDocument.java** package factory;

public class PdfDocument implements Document {

public void open() {

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

}

}

**ExcelDocument.java** package factory;

public class ExcelDocument implements Document {

public void open() {

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

}

}

**DocumentFactory.java** package factory;

public abstract class DocumentFactory { public abstract Document createDocument(); }

**WordFactory.java** package factory;

public class WordFactory extends DocumentFactory { public Document createDocument() { return new WordDocument();

}

}

**PdfFactory.java** package factory;

public class PdfFactory extends DocumentFactory { public Document createDocument() { return new PdfDocument();

}

}

**ExcelFactory.java** package factory;

public class ExcelFactory extends DocumentFactory { public Document createDocument() { return new ExcelDocument();

}

}

**Main.java (contains main() method)** package factory;

public class Main { public static void main(String[] args) {

DocumentFactory factory;

factory = new WordFactory();

Document word = factory.createDocument(); word.open();

factory = new PdfFactory();

Document pdf = factory.createDocument();

pdf.open();

factory = new ExcelFactory();

Document excel = factory.createDocument(); excel.open();

}

}

**Output:**

