

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.

ANSWER:

Document Interface:

```
Document.java ×
1 public interface Document {
2     void open();
3 }
4
```

Concrete Document classes:

WordDocument.java:

```
Document.java WordDocument.java ×
1 public class WordDocument implements Document {
2     public void open() {
3         System.out.println("Opening Word Document");
4     }
5 }
6
```

PdfDocument.java:

```
Document.java WordDocument.java PdfDocument.java ×
1 public class PdfDocument implements Document {
2     public void open() {
3         System.out.println("Opening PDF Document.");
4     }
5 }
6
```

ExcelDocument.java:

```
Document.java WordDocument.java PdfDocument.java ExcelDocument.java ×
1 public class ExcelDocument implements Document {
2     public void open() {
3         System.out.println("Opening Excel Document.");
4     }
5 }
6
```

Abstract Factory class:

DocumentFactory.java:

```
Document.java WordDocument.java PdfDocument.java
1 public abstract class DocumentFactory {
2     public abstract Document createDocument();
3 }
4
```

Concrete Factory Classes:

WordDocumentFactory.java:

```
Document.java WordDocument.java PdfDocument.java ExcelDocument.java
1 public class WordDocumentFactory extends DocumentFactory {
2     public Document createDocument() {
3         return new WordDocument();
4     }
5 }
6
```

PdfDocumentFactory.java:

```
WordDocument.java PdfDocument.java ExcelDocument.java DocumentFactory.java
1 public class PdfDocumentFactory extends DocumentFactory {
2     public Document createDocument() {
3         return new PdfDocument();
4     }
5 }
6
```

ExcelDocumentFactory.java:

```
PdfDocument.java ExcelDocument.java DocumentFactory.java WordDocument.java PdfDocument.java
1 public class ExcelDocumentFactory extends DocumentFactory {
2     public Document createDocument() {
3         return new ExcelDocument();
4     }
5 }
6
```

Test Class:

FactoryPatternTest.java:

```
ExcelDocume... DocumentFac... WordDocumen... PdfDocument... ExcelDocume... FactoryPatte... x »3
1 public class FactoryPatternTest {
2     public static void main(String[] args) {
3         DocumentFactory wordFactory = new WordDocumentFactory();
4         Document wordDoc = wordFactory.createDocument();
5         wordDoc.open();
6
7         DocumentFactory pdfFactory = new PdfDocumentFactory();
8         Document pdfDoc = pdfFactory.createDocument();
9         pdfDoc.open();
10
11        DocumentFactory excelFactory = new ExcelDocumentFactory();
12        Document excelDoc = excelFactory.createDocument();
13        excelDoc.open();
14    }
15 }
16
```

Output:

```
Opening Word Document
Opening PDF Document.
Opening Excel Document.
```