

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.

FactoryMethodPatternExample

Document.java

```
public interface Document {  
    void open();  
}
```

WordDocument.java

```
public class WordDocument implements Document {  
    @Override  
    public void open() {  
        System.out.println("Opening a Word document...");  
    }  
}
```

PdfDocument.java

```
public class PdfDocument implements Document {  
    @Override  
    public void open() {  
        System.out.println("Opening a PDF document...");  
    }  
}
```

ExcelDocument.java

```
public class ExcelDocument implements Document {  
    @Override  
    public void open() {  
        System.out.println("Opening an Excel document...");  
    }  
}
```

DocumentFactory.java

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

WordDocumentFactory.java

```
public class WordDocumentFactory extends DocumentFactory {  
    @Override  
    public Document createDocument() {  
        return new WordDocument();  
    }  
}
```

PdfDocumentFactory.java

```
public class PdfDocumentFactory extends DocumentFactory {  
    @Override  
    public Document createDocument() {  
        return new PdfDocument();  
    }  
}
```

ExcelDocumentFactory.java

```
public class ExcelDocumentFactory extends DocumentFactory {  
    @Override  
    public Document createDocument() {  
        return new ExcelDocument();  
    }  
}
```

Main.java

```
public class Main {  
    public static void main(String[] args) {  
        DocumentFactory wordFactory = new WordDocumentFactory();  
        Document word = wordFactory.createDocument();  
        word.open();  
    }  
}
```

```
DocumentFactory pdfFactory = new PdfDocumentFactory();  
Document pdf = pdfFactory.createDocument();  
pdf.open();
```

```
DocumentFactory excelFactory = new ExcelDocumentFactory();  
Document excel = excelFactory.createDocument();  
excel.open();
```

```
}
```

```
}
```

OUTPUT:

```
FactoryMethodPatternExample > J Main.java > Main  
1 package FactoryMethodPatternExample;  
2  
3 public class Main {  
4     Run | Debug  
5     public static void main(String[] args) {  
6         DocumentFactory wordFactory = new WordDocumentFactory();  
7         Document word = wordFactory.createDocument();  
8         word.open();  
9     }  
10 }  
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