

Name: SASHMITHA R

Reg No: 727722EUCD042

## Exercise 1: Implementing the Singleton Pattern

```
1 package Q1;
2
3 public class Main {
4     public static void main(String[] args)
5     {
6         Logger l1 = Logger.getInstance();
7         l1.log("First log msg");
8
9         Logger l2 = Logger.getInstance();
10        l2.log("Second log msg");
11
12        if(l1 != l2)
13        {
14            System.out.println("l1 and l2 are different instances;");
15        }
16        else
17        {
18            System.out.println("l1 and l2 are same instances;");
19        }
20    }
21 }
22
```

```
1 package Q1;
2
3 public class Logger {
4     private static Logger instance;
5
6     private Logger()
7     {
8         System.out.println("Logger instance created");
9     }
10    public static Logger getInstance()
11    {
12        if(instance == null)
13        {
14            instance = new Logger();
15        }
16        return instance;
17    }
18    public void log(String msg)
19    {
20        System.out.println("LOG: " + msg);
21    }
22 }
23
```

```
<terminated> Main [Java Application] C:\Users\sashm\Downloads\eclipse-jee-2025-03-R-win32-x86_64\eclipse\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_21.0.6.v20250130-0529\jre\bin\javaw.exe
Logger instance created
LOG: First log msg
LOG: Second log msg
l1 and l2 are same instances
```

## Exercise 2: Implementing the Factory Method Pattern

### Document.java

```
package Q2;

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

### **WordDocument.java**

```
package Q2;

public class WordDocument implements Document{

    public void open()

    {

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

    }

}
```

### **PdfDocument.java**

```
package Q2;

public class PdfDocument implements Document{

    public void open()

    {

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

    }

}
```

### **ExcelDocument.java**

```
package Q2;

public class ExcelDocument implements Document{

    public void open() {

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

    }

}
```

### **DocumentFactory.java**

```
package Q2;

public abstract class DocumentFactory {

    public abstract Document createDocument();

}
```

**WordDocumentFactory.java**

```
package Q2;

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

**PdfDocumentFactory.java**

```
package Q2;

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

**ExcelDocumentFactory.java**

```
package Q2;

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

**Main.java**

```
package Q2;

public class Main {

    public static void main(String[] args)
    {

        DocumentFactory wordFactory = new WordDocumentFactory();

        Document wordDoc = wordFactory.createDocument();

        wordDoc.open();


        DocumentFactory pdfFactory = new PdfDocumentFactory();

        Document pdfDoc = pdfFactory.createDocument();

        pdfDoc.open();


        DocumentFactory excelFactory = new ExcelDocumentFactory();

        Document excelDoc = excelFactory.createDocument();

        excelDoc.open();

    }

}
```

**Output:**

Opening Word document

Opening PDF document

Opening Excel document