**Exercise 1: Implementing the Singleton Pattern**

**1. Create a New Java Project**

**2. Define a Singleton Class**

public class Logger {

    private static Logger instance;

    private Logger(){

        System.out.println("Logger initialized");

    }

    public static Logger getInstance(){

        if(instance==null){

            instance=new Logger();

        }

        return instance;

    }

    public void testFunc(){

        System.out.println("Logger is working fine!!!");

    }

}

**3. Implement the Singleton Pattern**

**4. Test the Singleton Implementation**

public class TestLogger {

    public static void main(String args[]) {

        Logger logger1 = Logger.getInstance();

        Logger logger2 = Logger.getInstance();

        logger1.testFunc();

        logger2.testFunc();

        if (logger1 == logger2) {

            System.out.println("Both instances are same");

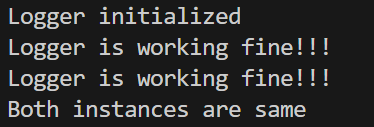
        } else {

            System.out.println("Both instances are different");

        }

    }

}



**Exercise 2: Implementing the Factory Method Pattern**

**1. Create a New Java Project**

**2. Define Document Classes**

**3. Create Concrete Document Classes:**

public interface Document {

    void open();

}

public class WordDocument implements Document {

    public void open(){

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

    }

}

public class PdfDocument implements Document {

    public void open(){

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

    }

}

public class ExcelDocument implements Document {

    public void open(){

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

    }

}

**4. Implement the Factory Method**

public abstract class DocumentFactory {

    public abstract Document createDocument();

}

public class WordDocumentFactory extends DocumentFactory{

    public Document createDocument(){

        return new WordDocument();

    }

}

public class PDFDocumentFactory extends DocumentFactory{

    public Document createDocument(){

        return new PdfDocument();

    }

}

public class ExcelDocumentFactory extends DocumentFactory{

    public Document createDocument(){

        return new ExcelDocument();

    }

}

**5. Test the Factory Method Implementation**

public class FactoryTest {

    public static void main(String[] args) {

        DocumentFactory wordDoc=new WordDocumentFactory();

        Document wd=wordDoc.createDocument();

        wd.open();

        DocumentFactory pdfDoc=new PDFDocumentFactory();

        Document pd=pdfDoc.createDocument();

        pd.open();

        DocumentFactory excelDoc=new ExcelDocumentFactory();

        Document ed=excelDoc.createDocument();

        ed.open();

    }

}

