**Exercise 1: Implementing the Singleton Pattern**

**1,2.**

**Code**

public class Logger{

    private static Logger instance;

    private Logger(){

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

    }

    public static Logger getInstance(){

        if(instance==null){

            instance = new Logger();

        }

        return instance;

    }

    public void TestFunction(){

        System.out.println("Working!!");

    }

}

**3,4.**

**Code**

public class LoggerTest {

    public static void main(String[] args) {

        Logger logger=Logger.getInstance();

        Logger logger1=Logger.getInstance();

        logger.TestFunction();

        logger1.TestFunction();

        if(logger==logger1){

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

        }

        else{

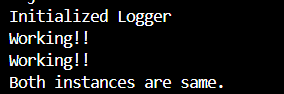
             System.out.println("Both instances are not same.");

        }

    }

}

**Output**

****

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

**1,2,3.**

**Code**

public interface Document {

    void open();

}

public class WordDocument implements Document {

    public void open() {

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

    }

}

public class PdfDocument implements Document {

    public void open() {

        System.out.println("Pdf Document opens.");

    }

}

public class ExcelDocument implements Document {

    public void open() {

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

    }

}

**4.**

**Code**

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.**

**Code**

public class Test {

    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**

