**1) Implementing the Singleton Pattern**

**Code**:

Logger.java

package SingletonPatternExample;

class Logger{

  private static Logger instance = null;

  private Logger(){}

  public static Logger getInstance(){

    if(instance==null) instance = new Logger();

    return instance;

  }

}

LoggerTest.java

package SingletonPatternExample;

public class LoggerTest {

    public static void main(String[] args) {

        Logger logger1 = Logger.getInstance();

        Logger logger2 = Logger.getInstance();

        if (logger1 == logger2) {

            System.out.println("PASS: Both logger instances are the same.");

        } else {

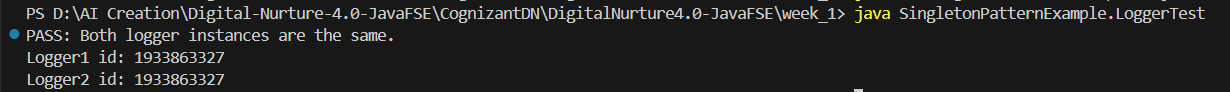
            System.out.println("FAIL: Logger instances are different.");

        }

    }

}

**Output:**



**2) Implementing the Factory Method Pattern**

**Code:**

Document.java

package FactoryMethodPatternExample;

public interface Document {

  public void open();

}

WordDocument.java

package FactoryMethodPatternExample;

public class WordDocument implements Document{

  public void open(){

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

    }

}

PdfDocument.java

package FactoryMethodPatternExample;

public class PdfDocument implements Document{

  public void open(){

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

    }

}

ExcelDocument.java

package FactoryMethodPatternExample;

public class ExcelDocument implements Document{

  public void open(){

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

    }

}

DocumentFactory.java

package FactoryMethodPatternExample;

public abstract class DocumentFactory {

  public abstract Document createDocument();

}

WordDocumentFactory.java

package FactoryMethodPatternExample;

public class WordDocumentFactory extends DocumentFactory{

  @Override

  public Document createDocument(){

    return new WordDocument();

  }

}

PdfDocumentFactory.java

package FactoryMethodPatternExample;

public class PdfDocumentFactory extends DocumentFactory {

  @Override

  public Document createDocument() {

    return new PdfDocument();

  }

}

ExcelDocumentFactory.java

package FactoryMethodPatternExample;

public class ExcelDocumentFactory extends DocumentFactory {

  @Override

  public Document createDocument() {

    return new ExcelDocument();

  }

}

DocumentFactoryTest.java

package FactoryMethodPatternExample;

public class DocumentFactoryTest {

    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:**

