Exercise 1: Implementing the Singleton Pattern

Code:

public class SingletonPatternExample {

    static class Logger {

        private static Logger instance;

        private Logger() {

            System.out.println("Logger instance created");

        }

        public static Logger getInstance() {

            if (instance == null) {

                instance = new Logger();

            }

            return instance;

        }

        public void log(String message) {

            System.out.println("[LOG] " + message);

        }

    }

    public static void main(String[] args) {

        Logger logger1 = Logger.getInstance();

        Logger logger2 = Logger.getInstance();

        logger1.log("First message");

        logger2.log("Second message");

        if (logger1 == logger2) {

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

        } else {

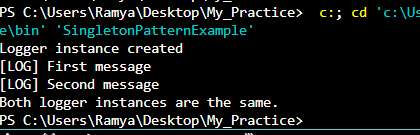
            System.out.println("Logger instances are different!");

        }

    }

}

Output:



Exercise 2: Implementing the Factory Method Pattern

Code:

public class FactoryMethodDemo {

    interface Document {

        void open();

    }

    static class WordDocument implements Document {

        public void open() {

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

        }

    }

    static class PdfDocument implements Document {

        public void open() {

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

        }

    }

    static class ExcelDocument implements Document {

        public void open() {

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

        }

    }

    abstract static class DocumentFactory {

        public abstract Document createDocument();

    }

    static class WordDocumentFactory extends DocumentFactory {

        public Document createDocument() {

            return new WordDocument();

        }

    }

    static class PdfDocumentFactory extends DocumentFactory {

        public Document createDocument() {

            return new PdfDocument();

        }

    }

    static class ExcelDocumentFactory extends DocumentFactory {

        public Document createDocument() {

            return new ExcelDocument();

        }

    }

    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:

