**Exercise 1: Implementing the Singleton Pattern**

**CODE:**

Logger.java

**package** com.example.singleton;

**public** **class** Logger {

**private** **static** Logger *SingleInstance*;

**private** Logger() {

System.***out***.println("Logger Instance is Created");

}

**public** **static** Logger getInstance() {

**if**(*SingleInstance*==**null**) {

*SingleInstance*=**new** Logger();

}

**return** *SingleInstance*;

}

**public** **void** log(String log) {

System.***out***.println(log);

}

}

Main.java

**package** com.example.singleton;

**public** **class** Main {

**public** **static** **void** main(String[] args) {

Logger log1=Logger.*getInstance*();

Logger log2=Logger.*getInstance*();

log1.log("First Log Message");

log2.log("Second Log Message");

**if**(log1==log2)

{

System.***out***.println("singleton works");

}

**else**

{

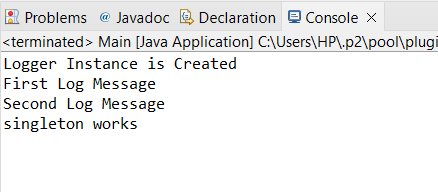
System.***out***.println("singleton failed");

}

}

}

**OUTPUT:**

****

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

**CODE:**

WordDocument.java

**package** com.example.factory;

**public** **class** WordDocument **implements** Document {

**public** **void** open() {

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

}

}

PdfDocument.java

**package** com.example.factory;

**public** **class** PdfDocument **implements** Document {

**public** **void** open() {

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

}

}

ExcelDocument.java

**package** com.example.factory;

**public** **class** ExcelDocument **implements** Document {

**public** **void** open() {

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

}

}

DocumentFactory.java

**package** com.example.factory;

**public** **abstract** **class** DocumentFactory {

**public** **abstract** Document createDocument();

}

WordDocumentFactory.java

**package** com.example.factory;

**public** **class** WordDocumentFactory **extends** DocumentFactory{

**public** Document createDocument() {

**return** **new** WordDocument();

}

}

PdfDocumentFactory.java

**package** com.example.factory;

**public** **class** PdfDocumentFactory **extends** DocumentFactory {

**public** Document createDocument() {

**return** **new** PdfDocument();

}

}

ExcelDocumentFactory.java

**package** com.example.factory;

**public** **class** ExcelDocumentFactory **extends** DocumentFactory {

**public** Document createDocument() {

**return** **new** ExcelDocument();

}

}

Main.java

**package** com.example.factory;

**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();

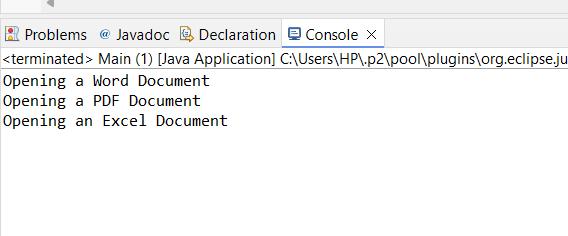
Document excelDoc=excelFactory.createDocument();

excelDoc.open();

}

}

**OUTPUT:**

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