

**Name: Amogh Girish Nagarkar**

**Superset ID: 6403503**

**DN-4.0 - Java FSE - Deep Skilling**

### **Exercise 1: Implementing the Singleton Pattern**

#### **Scenario:**

You need to ensure that a logging utility class in your application has only one instance throughout the application lifecycle to ensure consistent logging.

#### **Steps:**

##### **1. Create a New Java Project:**

- Create a new Java project named SingletonPatternExample.

##### **2. Define a Singleton Class:**

- Create a class named Logger that has a private static instance of itself.
- Ensure the constructor of Logger is private.
- Provide a public static method to get the instance of the Logger class.

##### **3. Implement the Singleton Pattern:**

- Write code to ensure that the Logger class follows the Singleton design pattern.

##### **4. Test the Singleton Implementation:**

Create a test class to verify that only one instance of Logger is created and used across the application.

Code:

Logger.java

```
package singleton;
```

```
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 log(String message) {
            System.out.println("Log: " + message);
        }
    }
}

Main.java

package singleton;

public class Main {
    public static void main(String[] args) {
        Logger logger1 = Logger.getInstance();

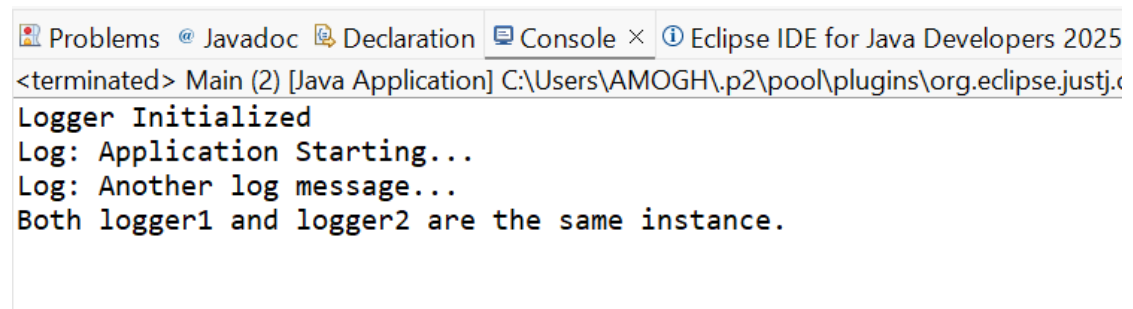
        logger1.log("Application Starting...");

        Logger logger2 = Logger.getInstance();
        logger2.log("Another log message...");

        if (logger1 == logger2) {
            System.out.println("Both logger1 and logger2 are the same instance.");
        } else {
            System.out.println("Error! Different instances");
        }
    }
}

```

### Output:

A screenshot of the Eclipse IDE's console window. The window has a title bar with tabs for 'Problems', 'Javadoc', 'Declaration', 'Console', and 'Eclipse IDE for Java Developers 2025'. The 'Console' tab is active, showing the following output: '<terminated> Main (2) [Java Application] C:\Users\AMOGH\.p2\pool\plugins\org.eclipse.justj.c', 'Logger Initialized', 'Log: Application Starting...', 'Log: Another log message...', and 'Both logger1 and logger2 are the same instance.'

```
<terminated> Main (2) [Java Application] C:\Users\AMOGH\.p2\pool\plugins\org.eclipse.justj.c
Logger Initialized
Log: Application Starting...
Log: Another log message...
Both logger1 and logger2 are the same instance.
```