SE3030 - Software Architecture – 2025

Software Architecture - Assignment 01

Assignment : Microkernel Architecture
Objective : This assignment aims to assess students' understanding of the OSGi framework, its architecture, service communication, service registration, and the lifecycle management of OSGi bundles.
Weightage : 20% of the final grade
Released on : 20/02/2025
Deadline : 12.00 AM, 12/03/2025, +5.30 GMT

Guidelines:

1. This is an open-ended assignment, and the scenario can be created as needed.
2. The task is similar to the practical example in Lab Practical 01 and 02, requiring the development of a publisher-subscriber scenario.
3. Apache Felix, Eclipse Equinox, or any compatible OSGi framework may be used for deployment.
4. Marks will be awarded based on the specified deliverables, as outlined in the marking scheme below.
5. The submission deadline is **March 12, 2025**, with no extensions granted.
6. Each group may consist of a maximum of **four members**.
7. Any code directly copied from the internet, or another source will be considered **plagiarism** and handled accordingly. (Plagiarism detection software will be used for verification).

Task:

A **Producer-Consumer** scenario must be implemented using the OSGi framework for a suitable scenario that you may come up with. Separate service bundles should be created, where one or more **producer bundles** provide services, and one or more **consumer bundles** consume those services. Meaningful service communication between producers and consumers must be established.

The scenario may include **one or multiple producers** and **one or multiple consumers**, depending on the chosen design.

In this assignment, implementing at least one producer and one consumer per group member is sufficient. However, additional marks will be awarded for creativity if multiple producers and consumers are implemented.

Deliverables:

1. **Source codes** of producer implementation & consumer implementation.
2. **Producer & Consumer bundles** (jars)
3. **Report:**

   You should provide a report that include below details.

   a. Explanation of your scenario and the designed system using a diagram.
   b. Manifest implementation (Exported services/ imported services)
   c. All commands required to install and run bundles in the OSGi framework. (Clearly mention commands for the producer installation, consumer installation, running services in the correct order).
   d. Sample screenshots of the system behavior and outputs.

   Important: If the application does not run successfully during evaluation, marks may be awarded based on the screenshots provided in the report.

Marking Scheme:

Feature	**Allocated marks out of 20**	**Leader Marks**	**Member 02 Marks**	**Member 03 Marks**	**Member 04 Marks**
Producer / Consumer Manifest implementation	04				
Producer Implementation • Proper implementation of lifecycle methods • Proper service implementation • Producer bundle exposes the services successfully	04				

Consumer Implementation • Proper implementation of lifecycle methods • Proper service implementation • Consumer bundle consumes the required services successfully	04				
Report	04				
Creativity/ Complexity of the scenario	04				
Total Marks	**20**				

Group ID:

Comments per student regarding his/her marks

Student ID	Student Name	Marks

Evaluator Name: