National College of Ireland

Configuration Manual

MSc Research Project
Cloud Computing

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National College of Ireland

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Project Submission Sheet
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Student Name:	Shamir Ahamed A M
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Configuration Manual

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1 Introduction

This article covers the setting setup of the Cloud sim simulator for the simulation of container-based simulation. These comprise not just the tools and technology used to create the solution, but also the conditions necessary for its effective rollout. The document provides comprehensive instructions for setting up a simulation of this architecture for any other system.

2 Tools/Technologies Prerequisites

The following are some of the necessary conditions for the setup:

- JavaSE - 1.8
- Eclipse IDE
- Downloading Artifact (cloudsim-cloudsim-4.0)

3 Solution Deployment Configuration

As the Cloudsim tool is a Java application and I have used Windows machines for implementation, there are some things we need to do before we run the simulation.As the Cloudsim tool is a Java application and I have used Windows machines for implementation, there are some things we need to do before we run the simulation.

3.1 Installation of Java

The Eclipse platform, which was created with Java, may be used to create IDEs, IDE plugins, and rich client applications. You may use Eclipse as an integrated development environment (IDE) for Java language for simulation.

3.1.1 Download Link

url: `https://www.oracle.com/java/technologies/downloads/#java8`

3.1.2 Installation of java

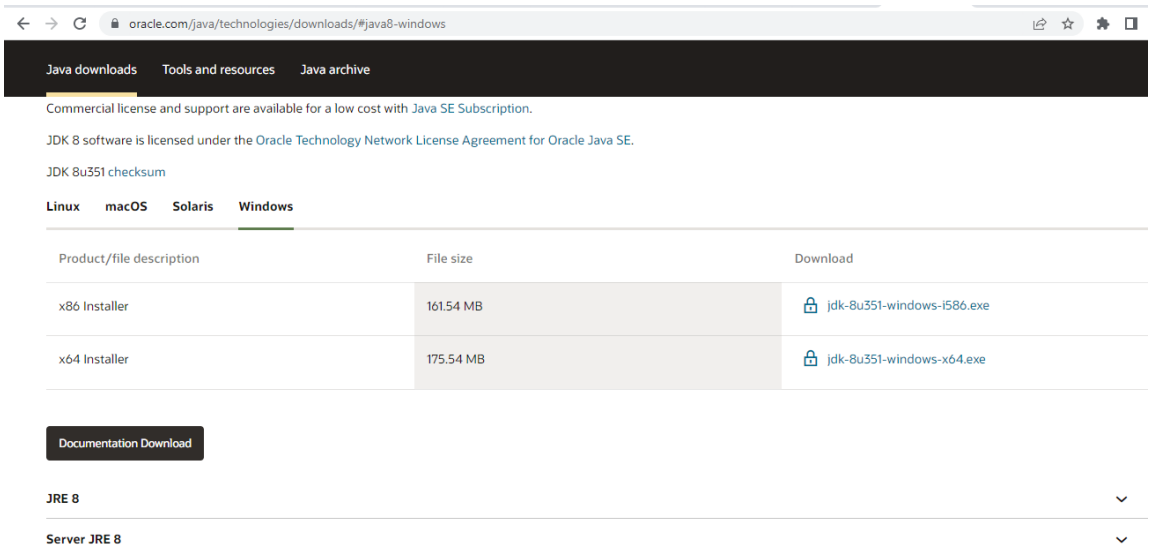

Figure 1: Click "Next"

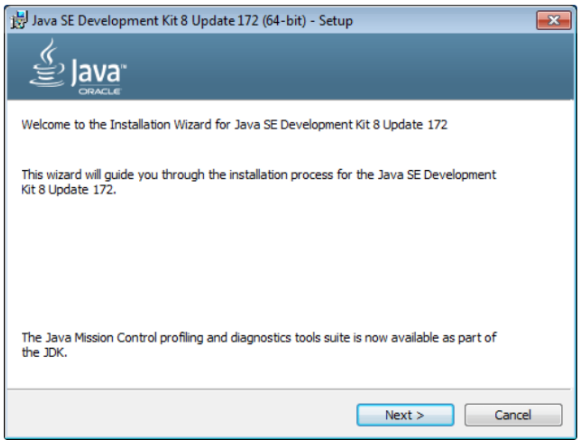

Figure 2: Click "Next"

Figure 3: Click "Close"

3.2 Installation of Eclipse IDE - V2022-09

In order to use Eclipse, system must meet certain criteria.

Table 1: Min. System Configuration

Memory	CPU	File Size:	OS
4GB	CPU: Intel Core i5-3570.	30 GB	Windows 7/10 (latest service pack)

Upon completion, the Eclipse Installer executable for Windows must be accessible in the downloads folder. Launch the program that will install Eclipse

3.2.1 Download Link

url: `https://www.eclipse.org/downloads/`

3.2.2 Installation of Eclipse

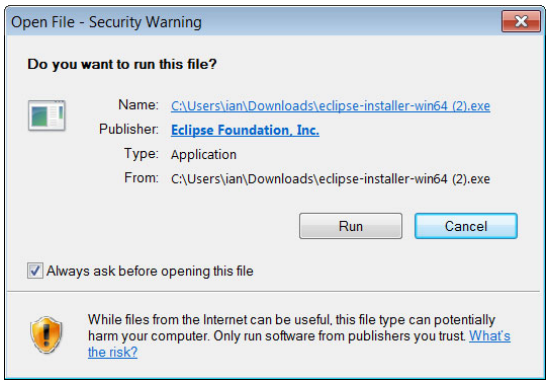

Figure 4: To launch Eclipse, run the installation file.

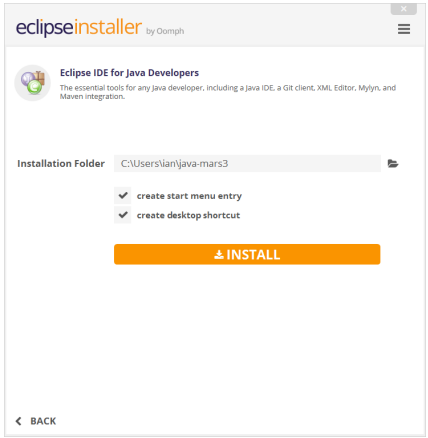

Figure 5: To start the installation, click the "Install" option.

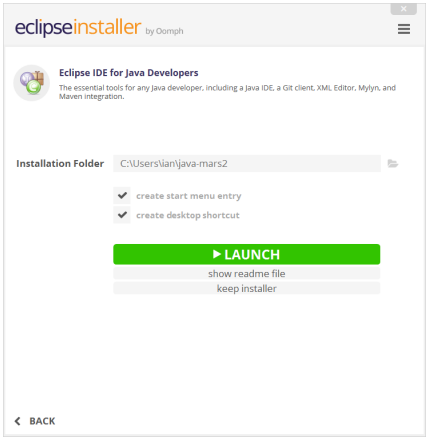

Figure 6: As soon as the setup is finished,Start Eclipse..

You may direct Eclipse's installation to a specific directory of your choosing. Your user directory is where things will be stored by default.

Open Eclipse As soon as the setup is finished,

3.3 Downloading Artifact (cloudsim-cloudsim-4.0)

We can download source code on NCI portal.
Alternatively we can download from github.

github repo url: `https://github.com/shamirahamed/Cloudsim_simulation.git`

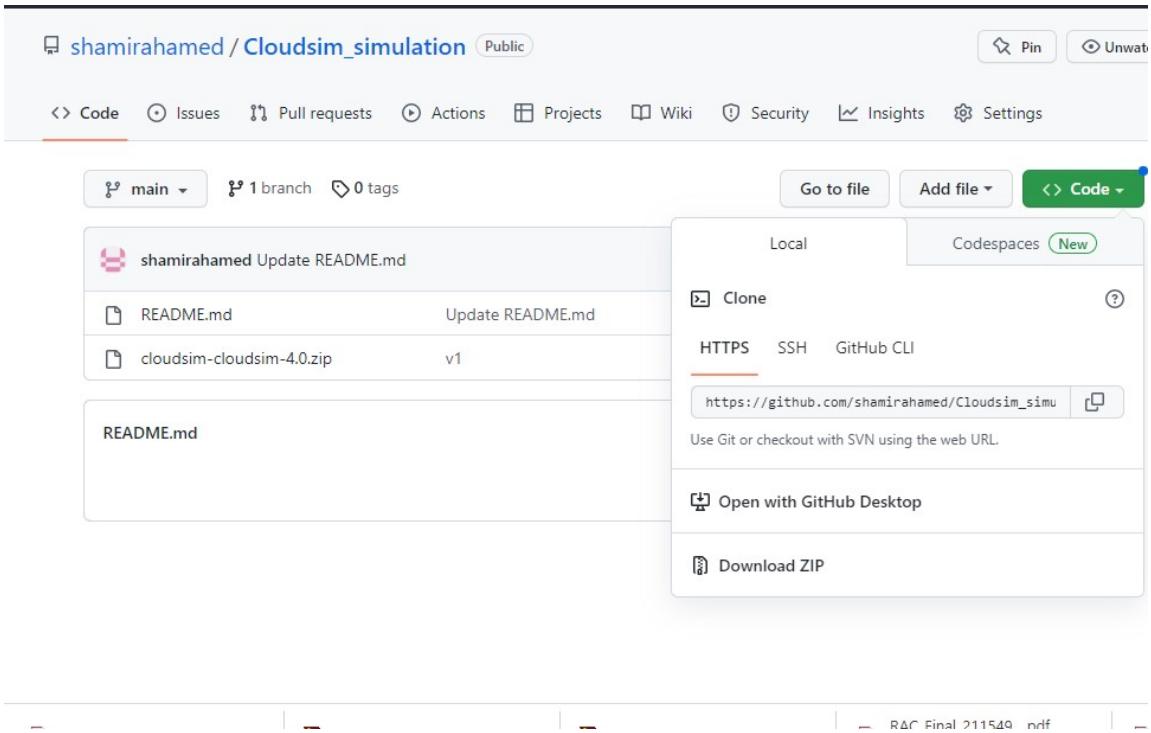

Figure 7: Code → DownloadZip

3.4 Import (cloudsim-cloudsim-4.0) Maven project to Eclipse IDE

Cloudsim Download link: `https://github.com/Cloudslab/cloudsim/releases` Cloudsim Scheduler link: `https://github.com/michaelfahmy/cloudsim-task-scheduling`

Importing Maven project from Artifact

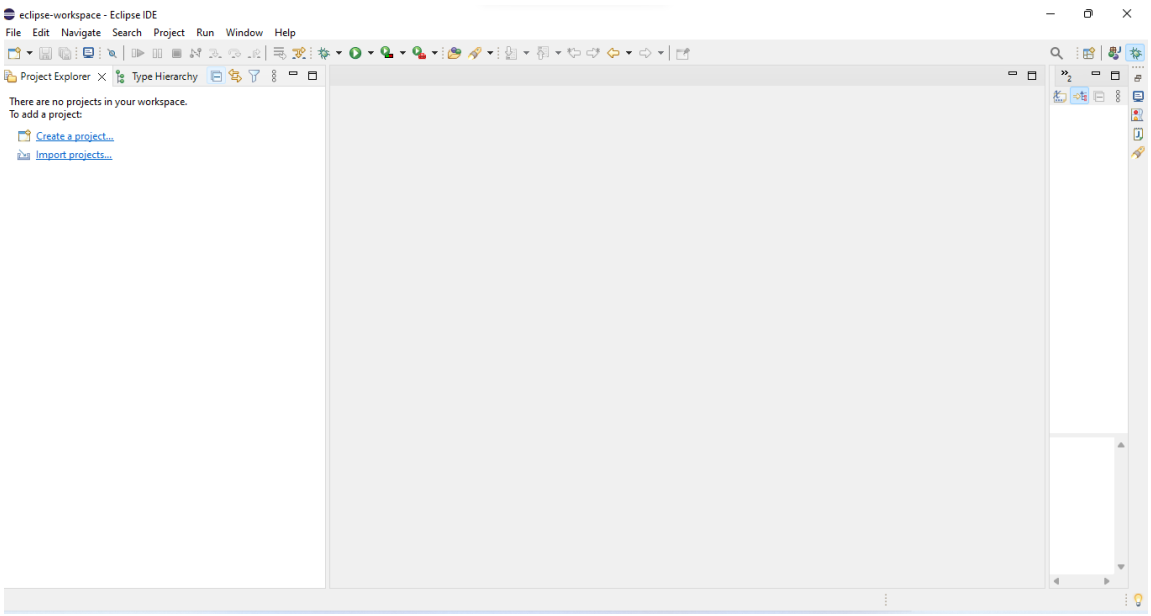

Figure 8: Import projects → Maven Projects

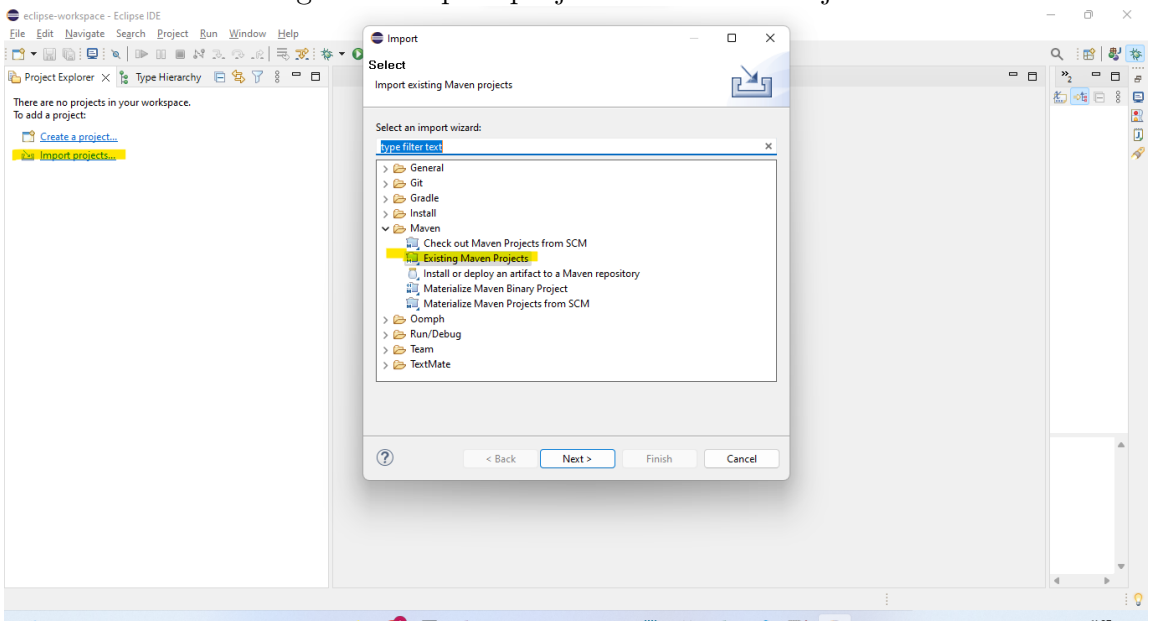

Figure 9: Import projects → Existing Maven Projects

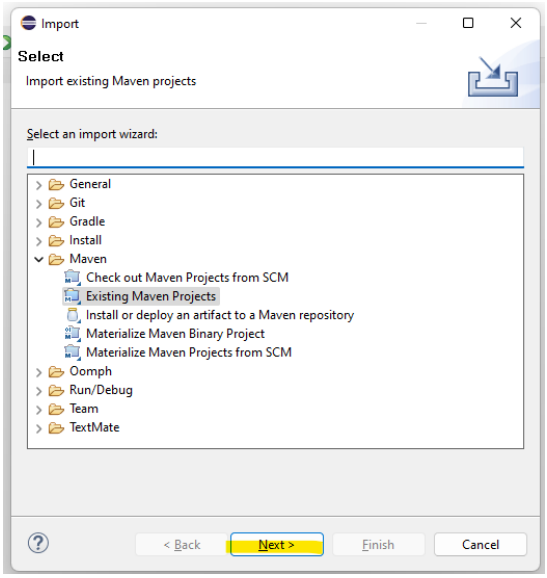

Figure 10: Click "Next"

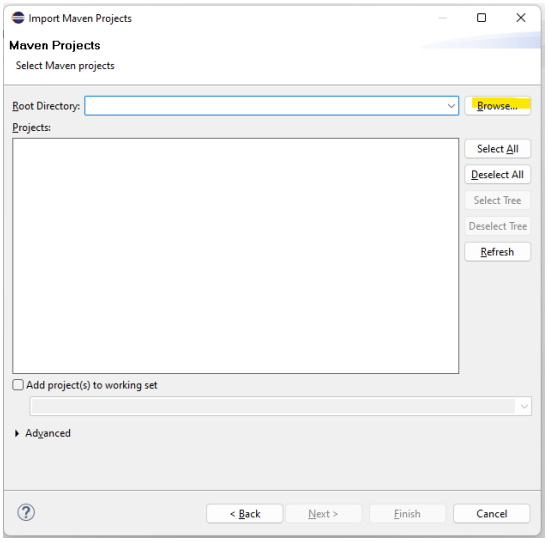

Figure 11: Click "Browse"

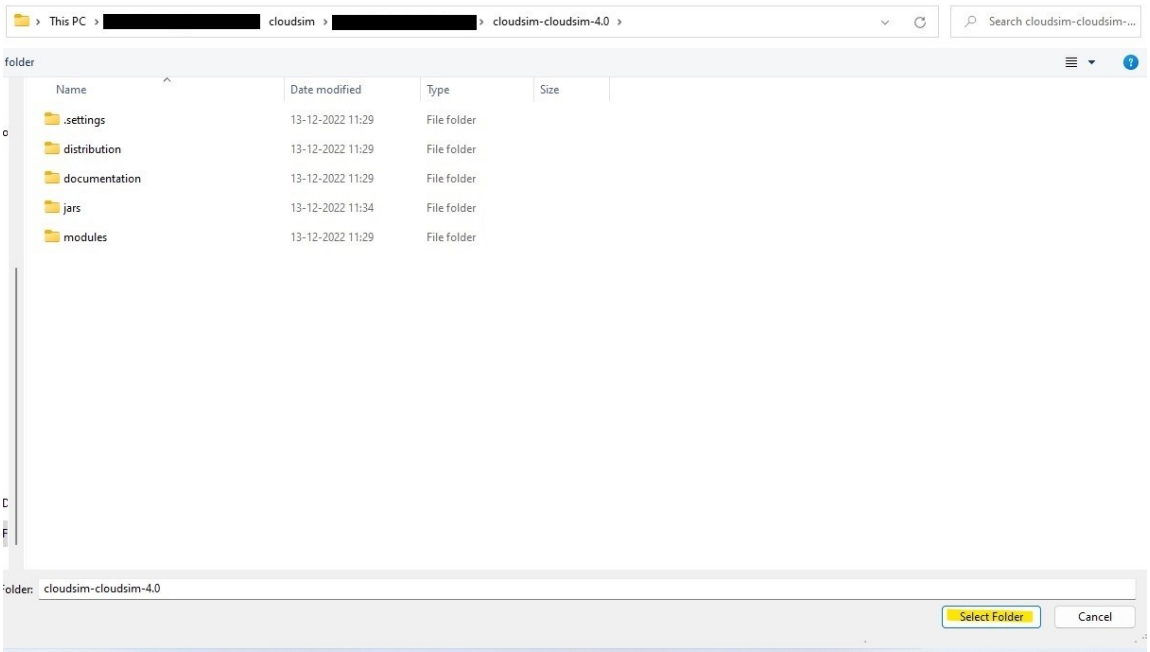

Figure 12: Browse the artifact location Location will be like → C:\ cloudsim-cloudsim-4.0

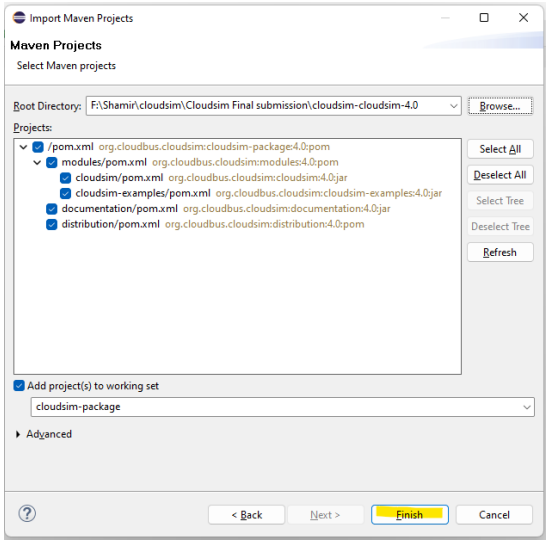

Figure 13: Click → Finish Please make sure all check boxes are marked

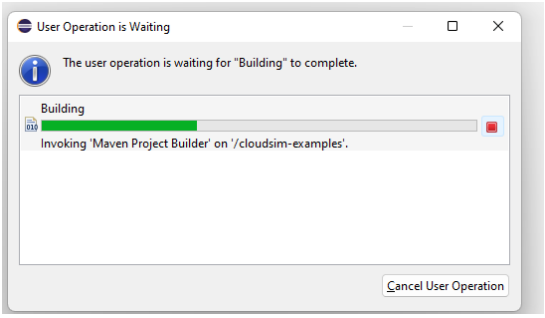

Figure 14: Wait for the build process to finish before responding to this pop-up.

4 Configuration

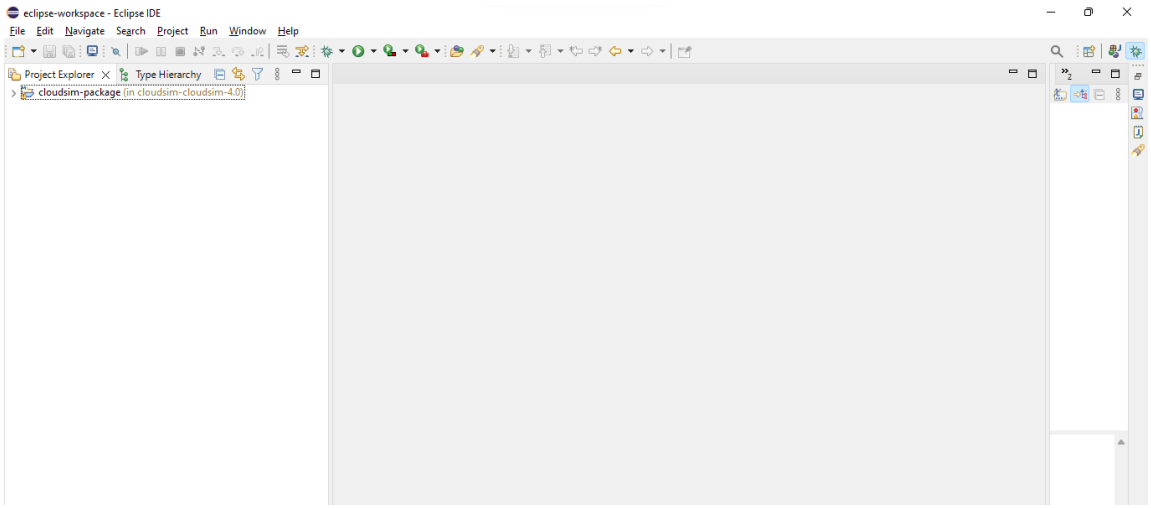

Figure 15: After build Eclipse IDE Looks Like

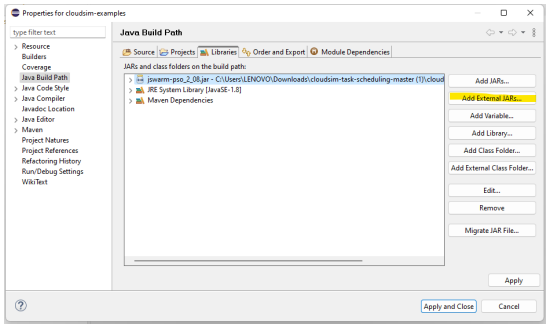

Figure 16: Right-click on the cloudsim-example folder and select Build Path. Java Build Path → Libraries Add External Jars

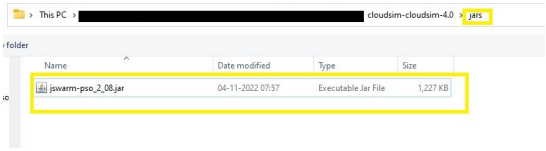

Figure 17: Location: C:\cloudsim-cloudsim-4.0.jars \ jswarm-pso-2-08.jar

5 Validations

Validations have been performed using standard cloud simulation tools (Cloudsim); moreover, we're implementing Continer modules and algorithms like FCFS,PSO,RR, and SJF, and feeding it data in accordance with AWS instance characteristics like cores,ram, and storage. We're layering container scheduling on top of the scheduling modules and utilizing it to gauge performance..

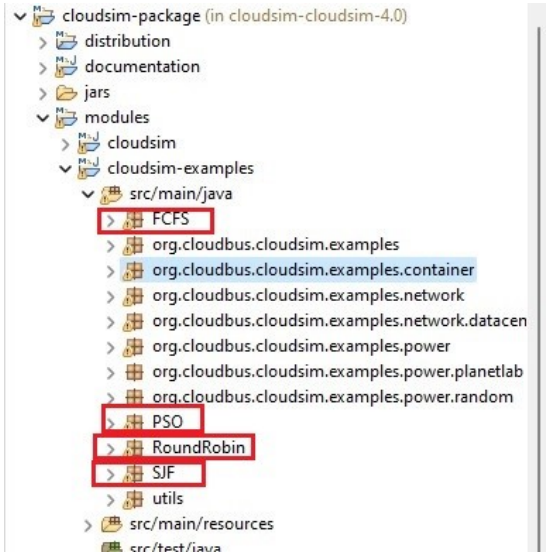

Figure 18: Project files are FCFS, PSO, RoundRobin, and SJF

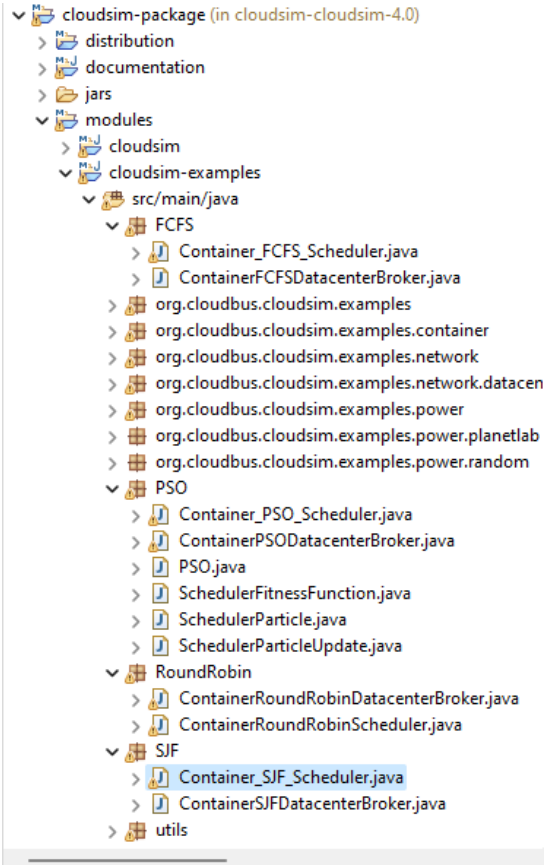

Figure 19: Expansion of project files

5.1 Workloadfiles and configurations

We can give different workload files and can be used in the program

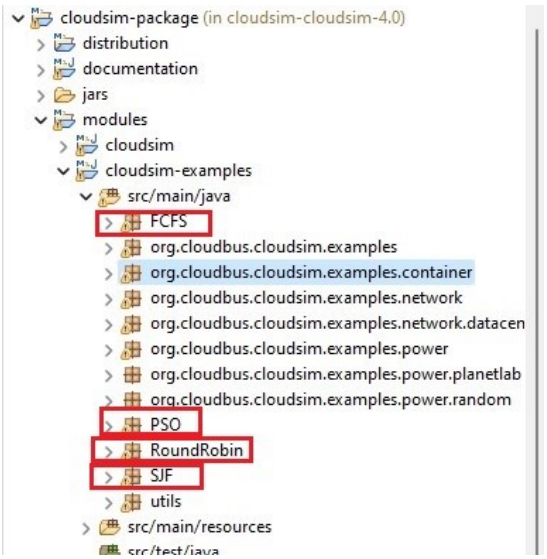

Figure 20: Workload files

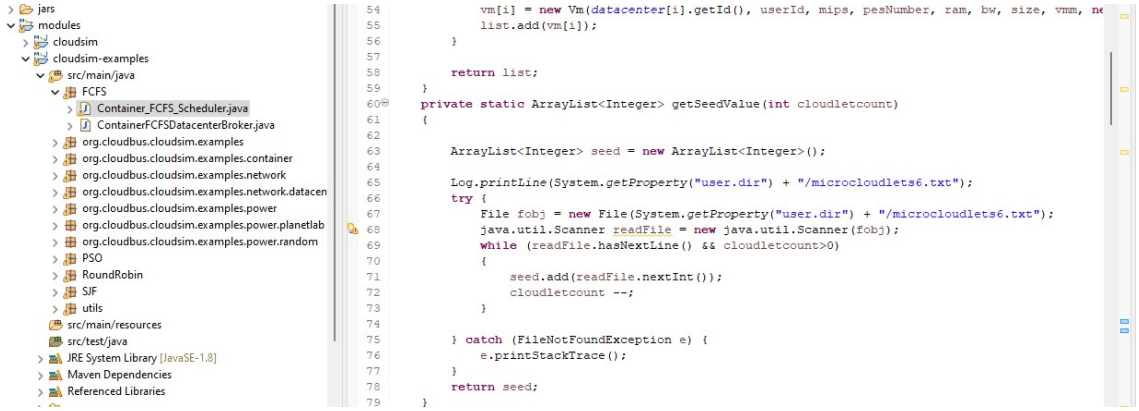

Figure 21: code for swapping Workload files

Figure 22: code for VM configurations it will be on Container(FCFS,PSO,SJF,RoundRobin).java

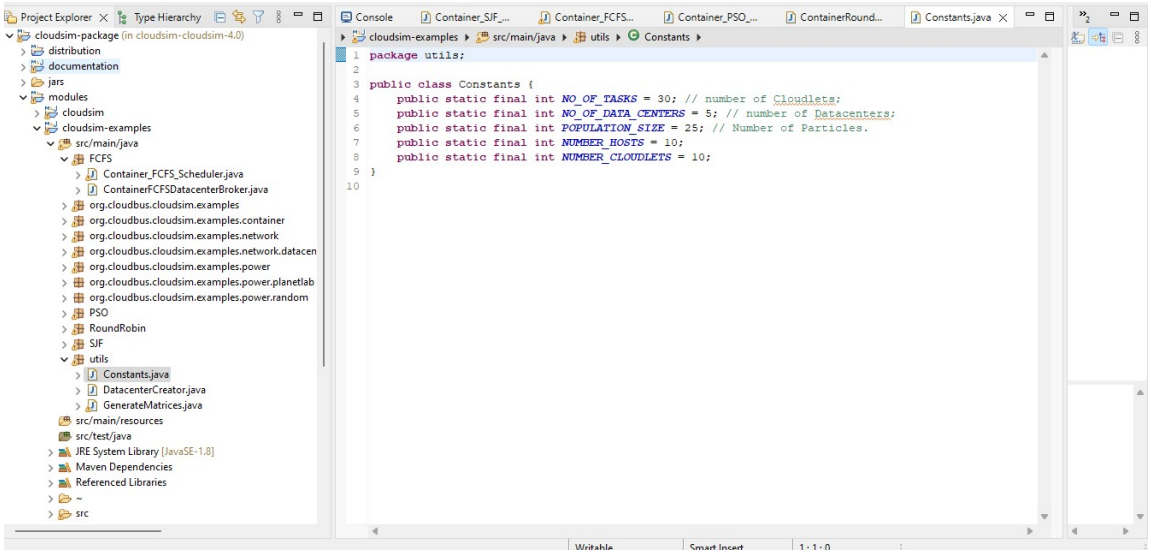

Figure 23: code for change some constants for Container(FCFS,PSO,SJF,RoundRobin).java → utils \ constants.java

5.2 Running Simulations

After running the simulations. We can evaluate the container scheduling using the logs which is printed on the console

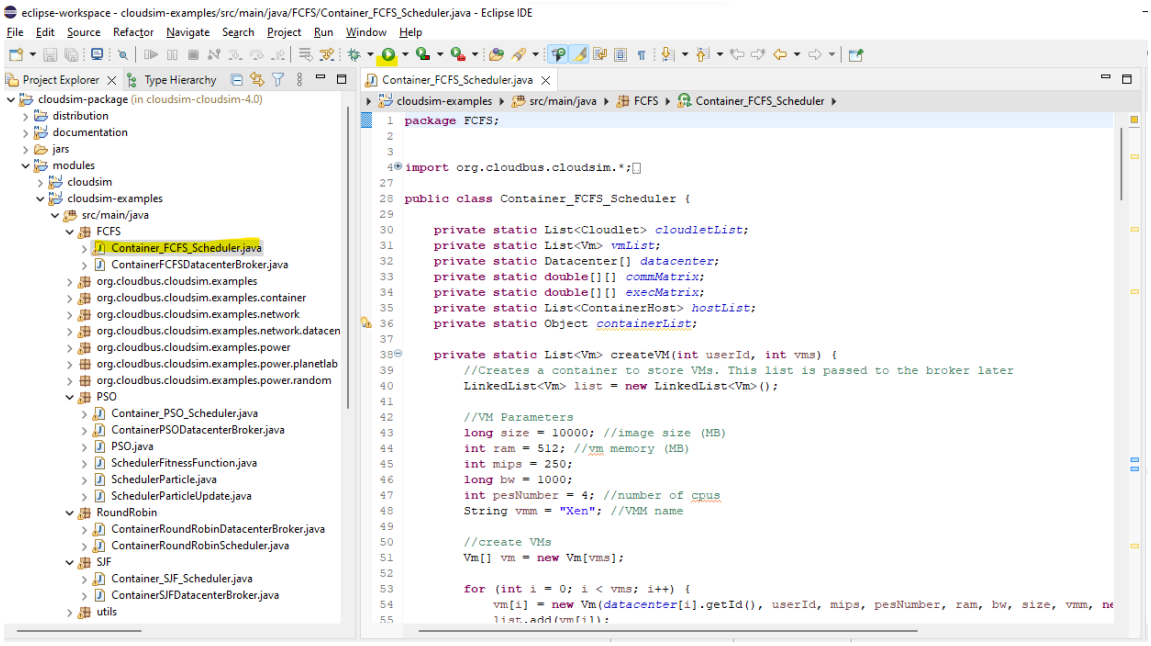

Figure 24: To run → Open Container-FCFS-Scheduler.java and click run button

```
========== OUTPUT ==========
CloudletID    DataCenterID    CloudletLength    VMID        ContainerID    CPU Utilization    Time     St
    22              4              2001            4             42              00.67          08     00.
    29              4              2101            4             44              00.53          08.4     0
    08              6              2185            6             63              00.47          08.74
    00              5              2194            5             51              00.54          08.78
    07              5              2211            5             53              00.58          08.89
    13              6              2338            6             64              00.49          09.35
    09              5              2442            5             54              00.76          09.77
    21              4              2501            4             41              00.77          10     00.
    02              2              2505            2             22              00.66          10.02
    01              2              2558            2             21              00.55          10.23
    06              5              2594            5             52              00.5           10.37     0
    28              3              2619            3             33              00.45          10.48
    05              2              2637            2             23              00.63          10.55
    17              3              2647            3             32              00.51          10.59
    04              6              2671            6             62              00.54          10.68
    10              2              2830            2             24              00.53          11.32
    03              6              2924            6             61              00.69          11.7     0
    23              4              2993            4             43              00.63          11.97
    16              3              2998            3             31              00.61          11.99
    19              6              2123            6             61              00.7           08.49    0
    15              5              2235            5             52              00.67          08.94
    26              5              2116            5             53              00.52          08.46
    12              5              2490            5             51              00.46          09.96
    27              5              2093            5             54              00.59          08.47
```

Figure 25: The output of FCFS Scheduler will be displayed in the console

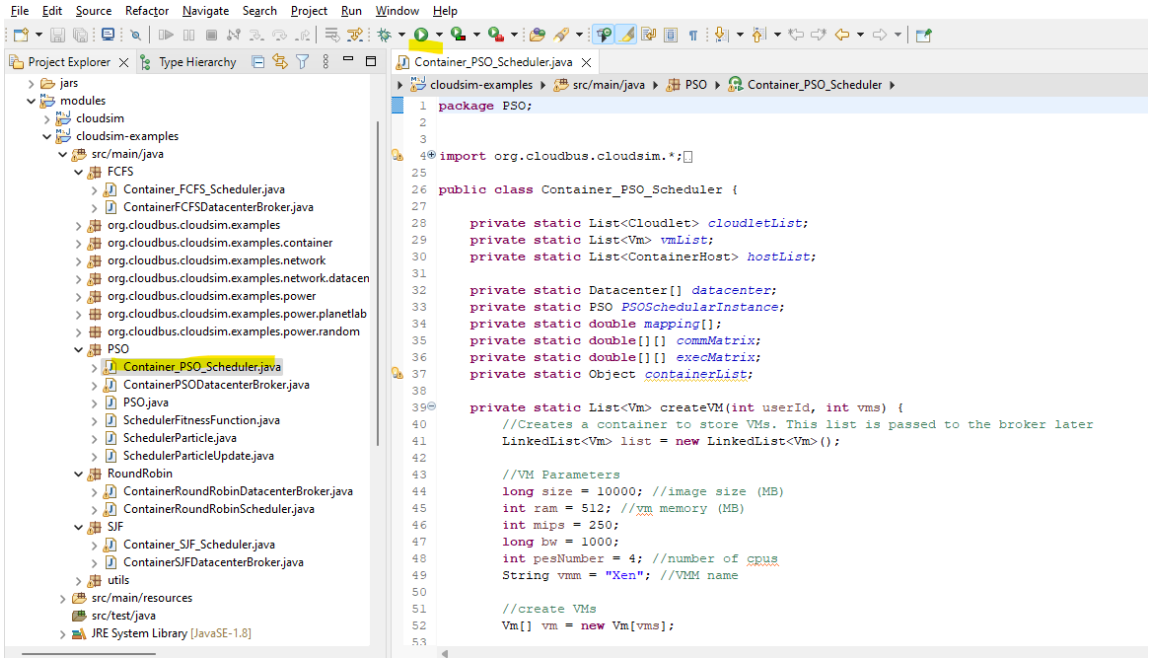

Figure 26: To run → Open Container-PSO-Scheduler.java and click run button

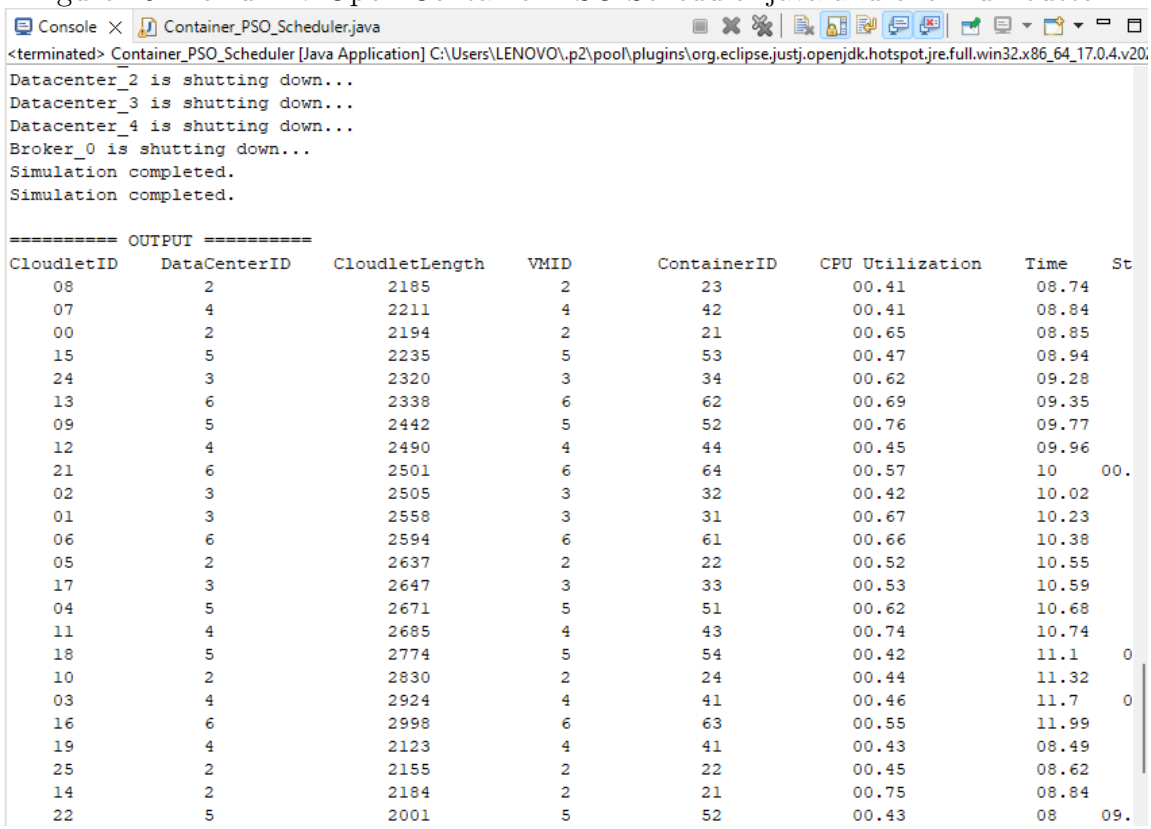

Figure 27: The output of PSO Scheduler will be displayed in the console

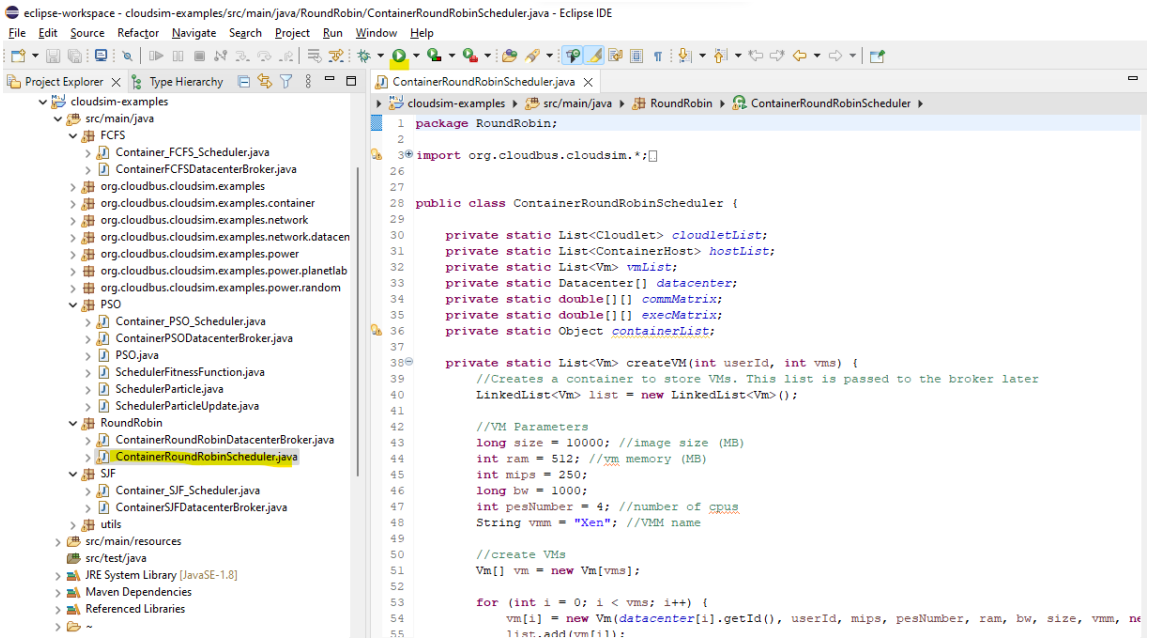

Figure 28: To run → Open Container-RoundRobinScheduler-Scheduler.java and click run button

```
========== OUTPUT ==========
CloudletID    DataCenterID    CloudletLength    VMID        ContainerID    CPU Utilization    Time     St
    22             4               2001           4             42             00.67          08     00.
    29             4               2101           4             44             00.53          08.4     0
    08             6               2185           6             63             00.47          08.74
    00             5               2194           5             51             00.54          08.78
    07             5               2211           5             53             00.58          08.89
    13             6               2338           6             64             00.49          09.35
    09             5               2442           5             54             00.76          09.77
    21             4               2501           4             41             00.77          10     00.
    02             2               2505           2             22             00.66          10.02
    01             2               2558           2             21             00.55          10.23
    06             5               2594           5             52             00.5           10.37     0
    28             3               2619           3             33             00.45          10.48
    05             2               2637           2             23             00.63          10.55
    17             3               2647           3             32             00.51          10.59
    04             6               2671           6             62             00.54          10.68
    10             2               2830           2             24             00.53          11.32
    03             6               2924           6             61             00.69          11.7     0
    23             4               2993           4             43             00.63          11.97
    16             3               2998           3             31             00.61          11.99
    19             6               2123           6             61             00.7           08.49    0
    15             5               2235           5             52             00.67          08.94
    26             5               2116           5             53             00.52          08.46
    12             5               2490           5             51             00.46          09.96
    27             5               2093           5             54             00.59          08.47
```

Figure 29: The output of RoundRobinScheduler Scheduler will be displayed in the console

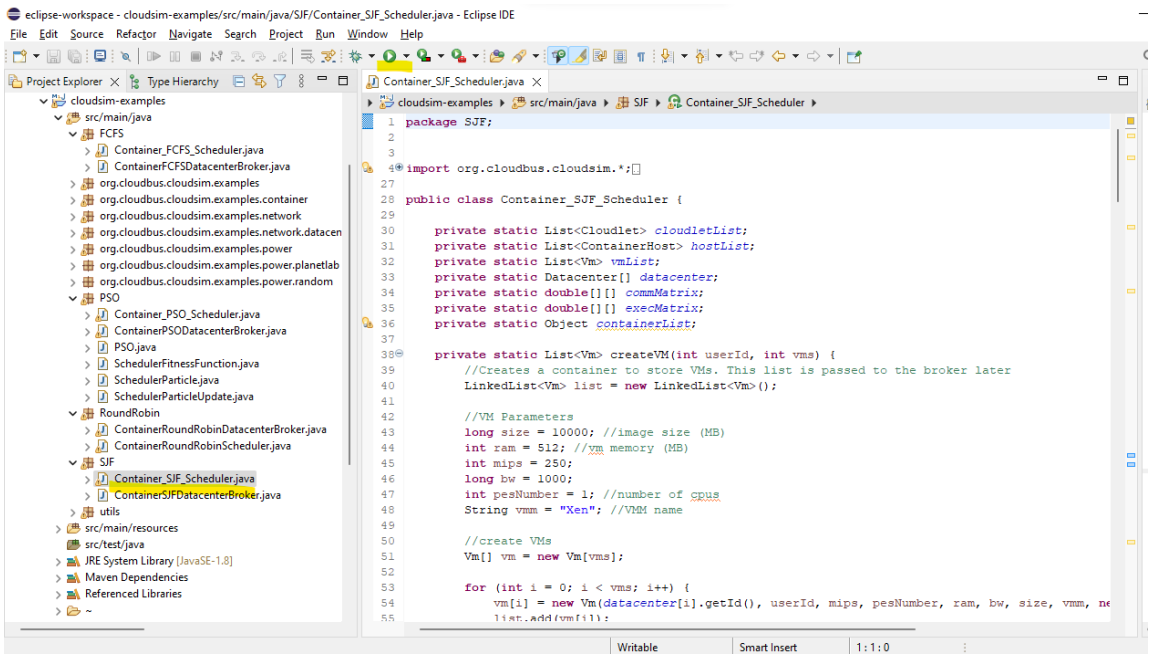

Figure 30: To run → Open Container-SJF-Scheduler.java and click run button

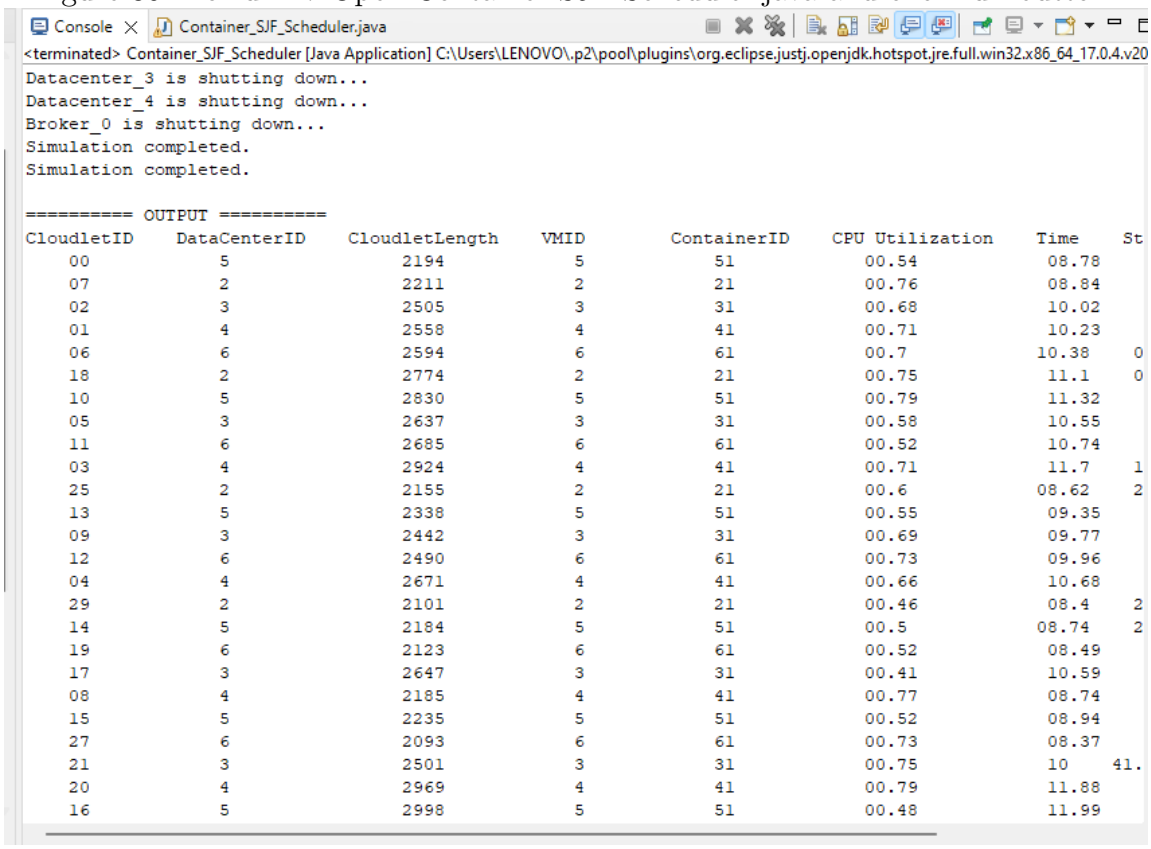

Figure 31: The output of SJF Scheduler will be displayed in the console