Configuration Manual

MSc Research Project
Msc Cloud Computing

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Programme:	Msc Cloud Computing…………………………………… **Year:** Jan 2022………..
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I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

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Date:	14/12/2022…………………………………………………..……………………………

PLEASE READ THE FOLLOWING INSTRUCTIONS AND CHECKLIST

Attach a completed copy of this sheet to each project (including multiple copies)	☐
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Configuration Manual

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1 Introduction

Using an enhanced genetic algorithm, load balancing is implemented as shown in this Configuration Manual.

2 Prerequisites

1. Java JDK 17

2. Eclipse IDE
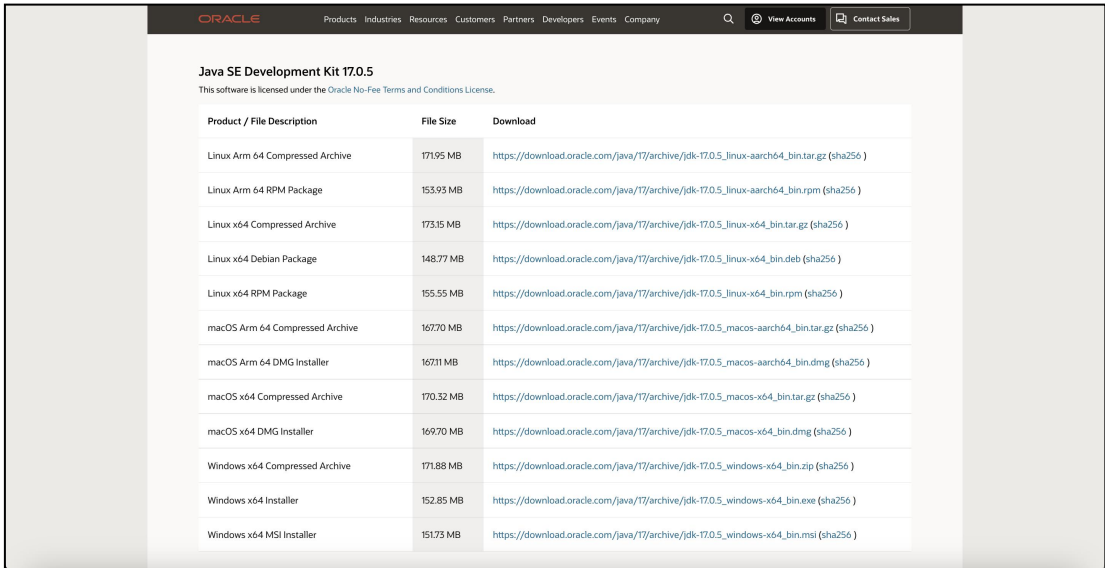
3. CloudSim 3.0.3 Framework

Note: Please follow the specific instruction for your OS to install the prerequisites as these prerequisites were installed and ran on MacOS (M1 edition).
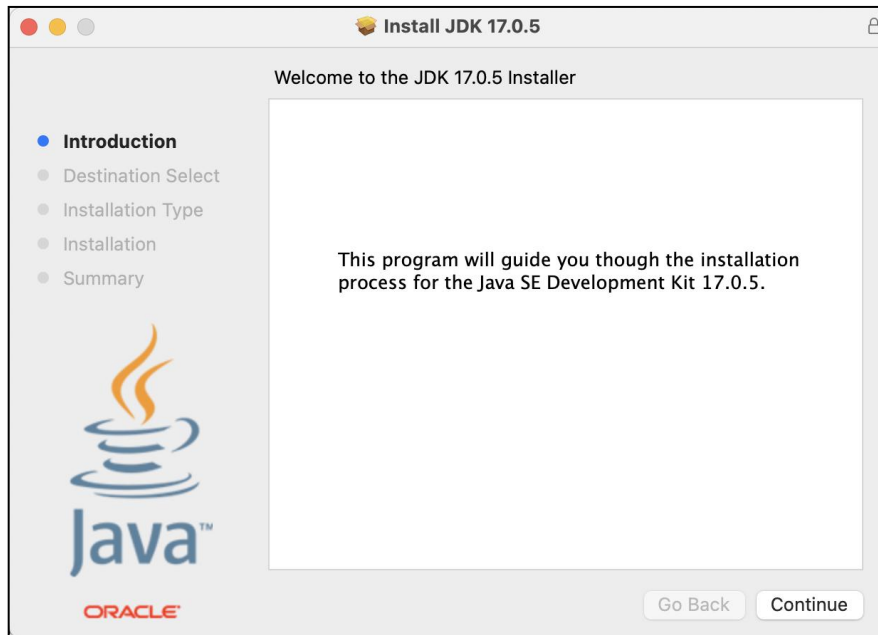
3 Prerequisite Installation

3.1 Java JDK 17

Step 1: Download Java JDK 17.0.5 for your appropriate OS.
https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html

Step 2: Install JDK

Step 3: Click on "**Install**" to install JDK.

3.2 Eclipse IDE

Step 1: Download Eclipse IDE from the following link.
https://www.eclipse.org/downloads/
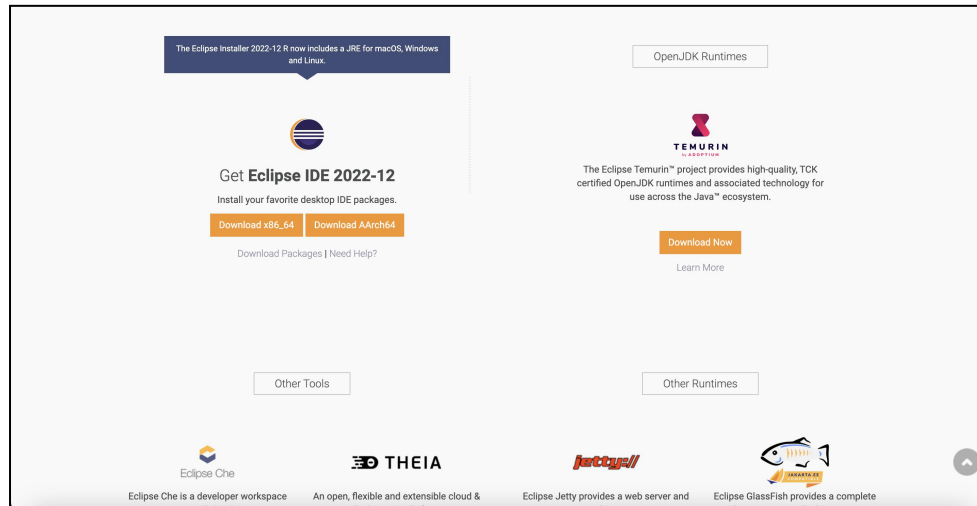
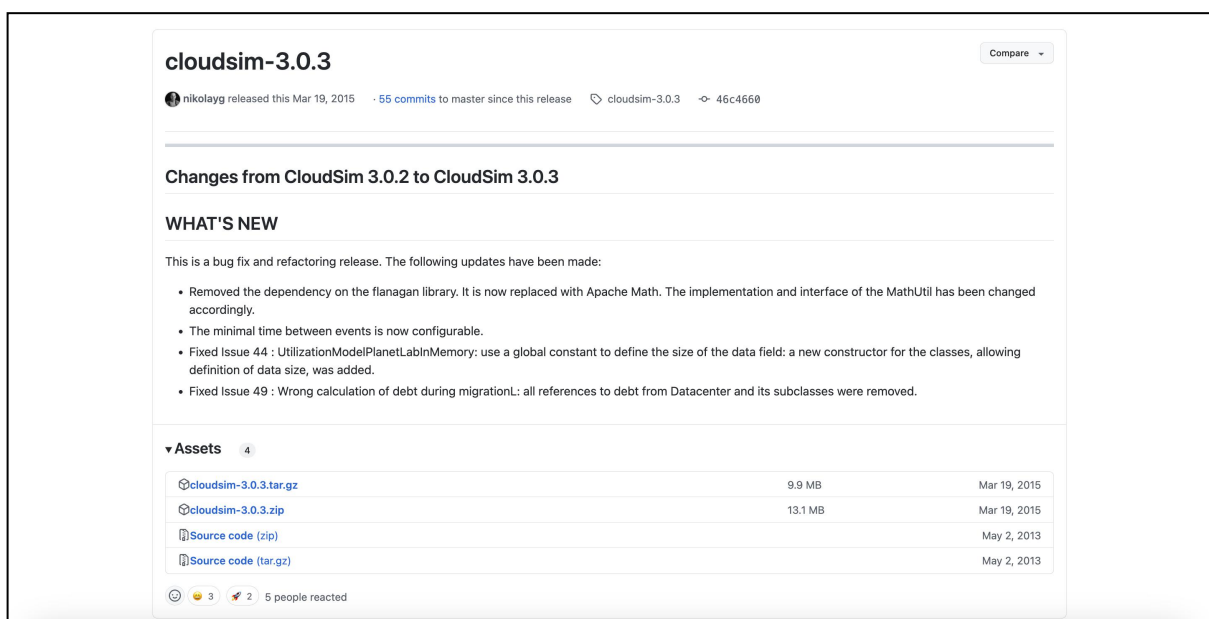**Step 2:** Select "**Eclipse IDE for Java Developers**".
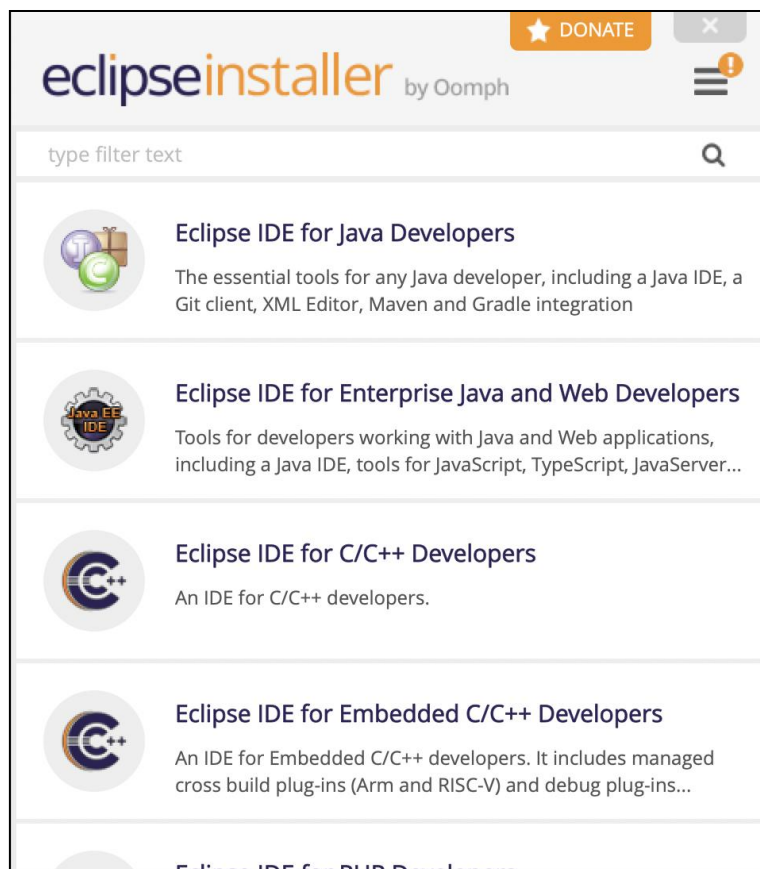
Step 3: Select the JDK path where you installed the Java JDK and the installation folder. Click on install to install.
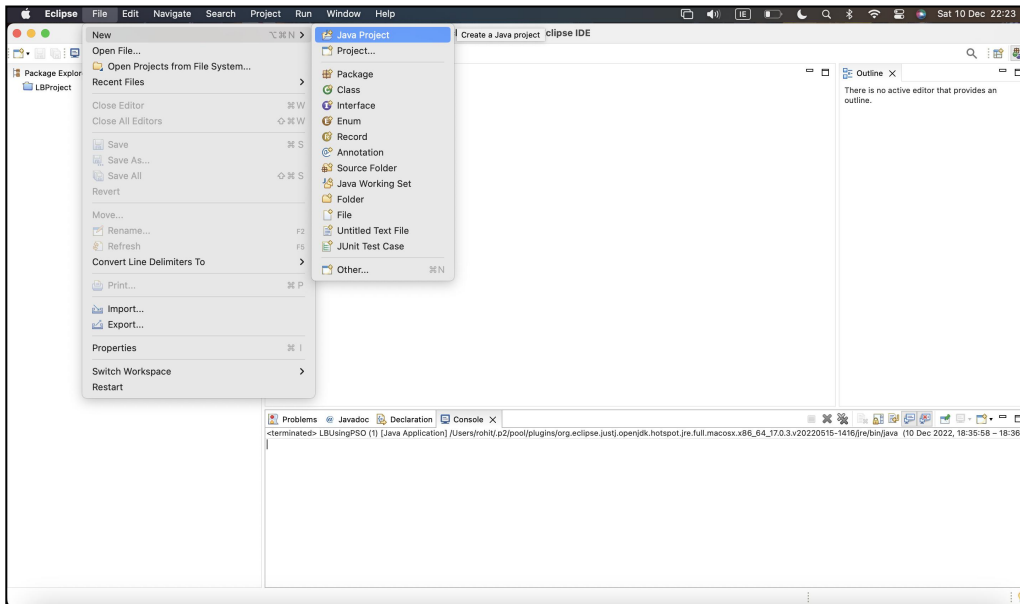

3.3 CloudSim v3.0.3

Step 1: Download CloudSim v3.0.3 from the following link.
https://github.com/Cloudslab/cloudsim/releases/tag/cloudsim-3.0.3

4 Running the proposed code

Step 1: Create a new Java Project. Click on **"File"** ➔ **"New"** ➔ **"Java Project"**.
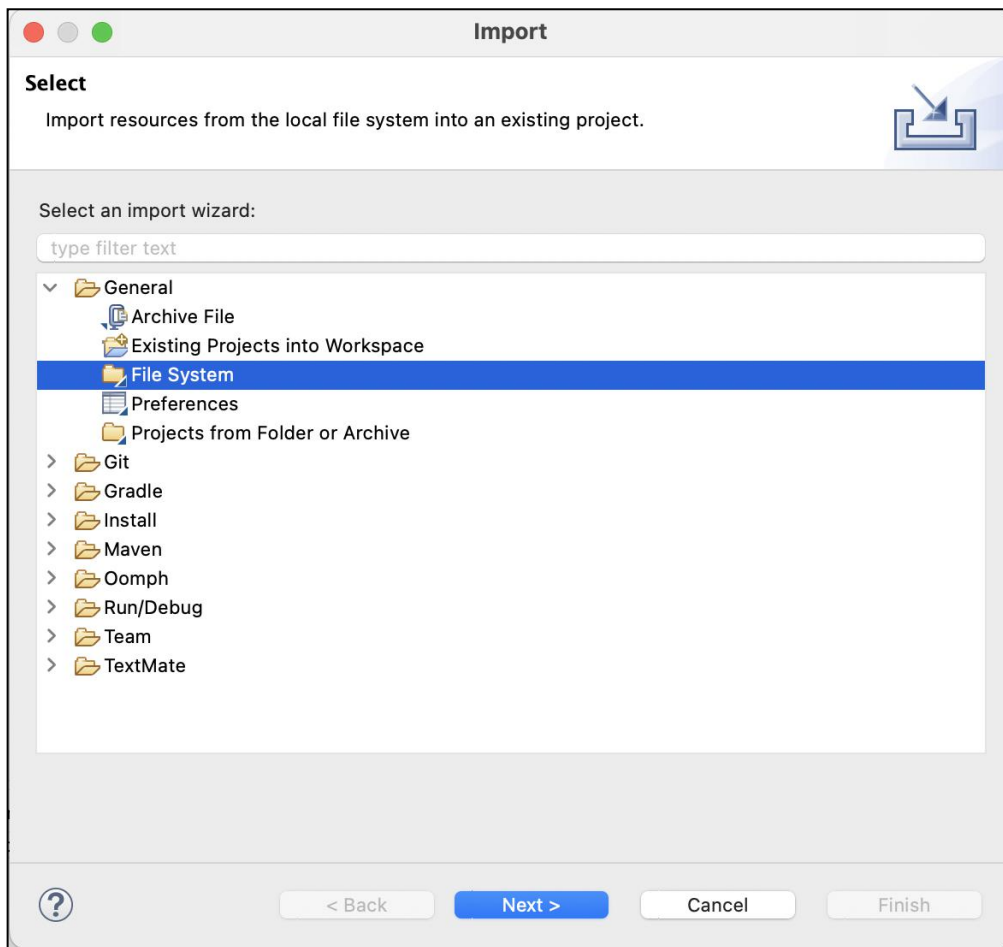

Step 2: Give your project a name in the field **"Project Name"** and untick the option **"Use default location"**. Click on **"Browse"** to select the path where you have download CloudSim v3.0.3. Then click on **"Finish"**.
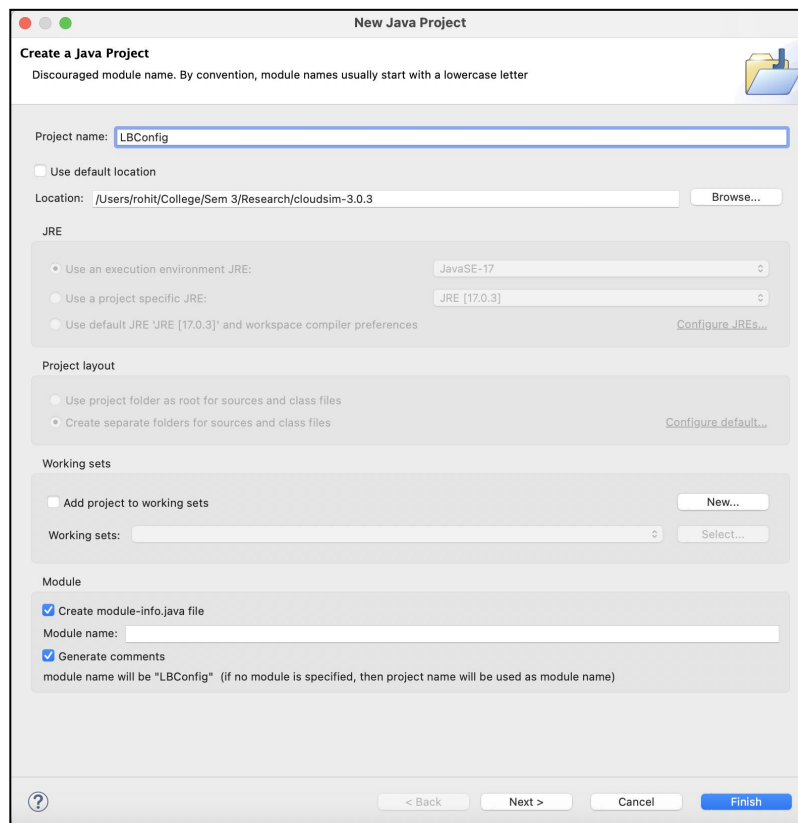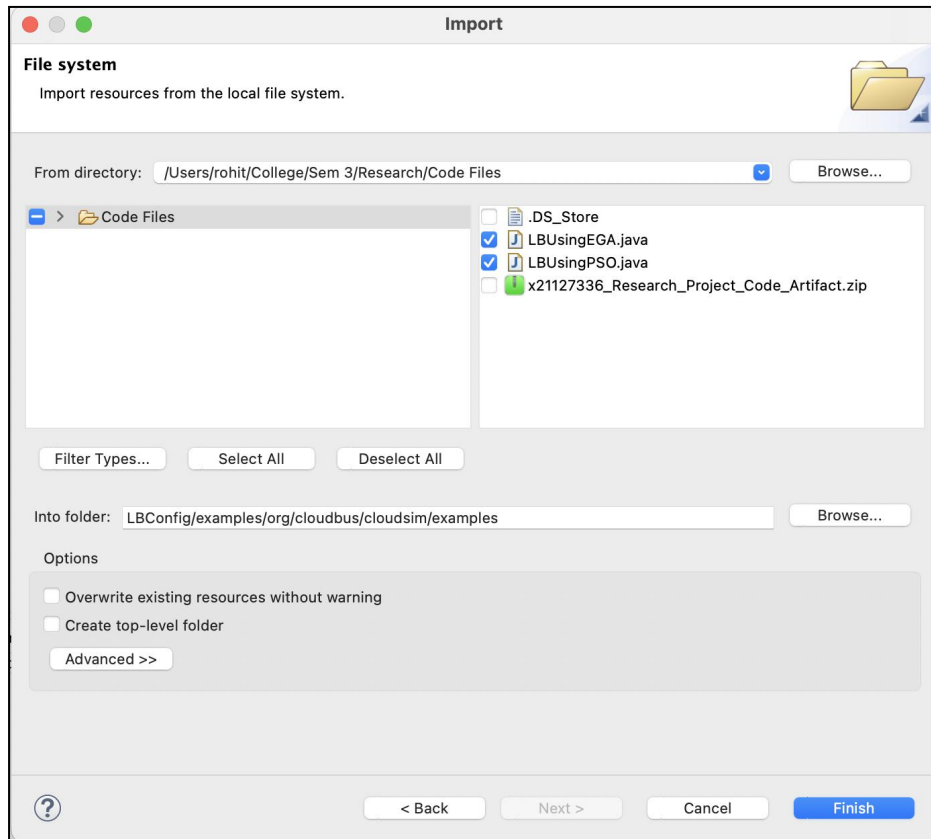
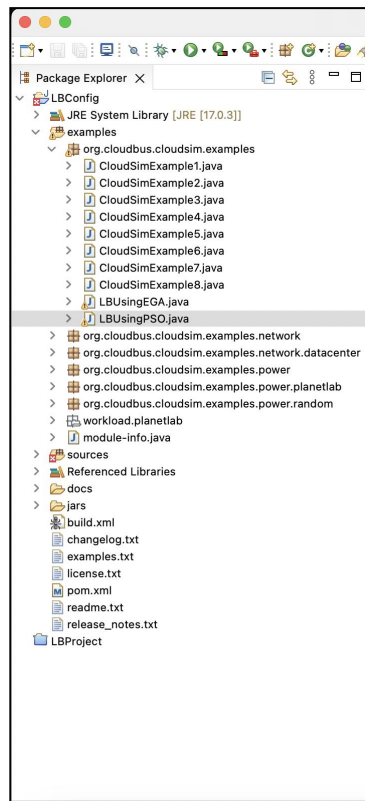**Step 3:** Open the examples, right click on **"org.cloudbus.cloudsim.examples"** and select **"Import"**.
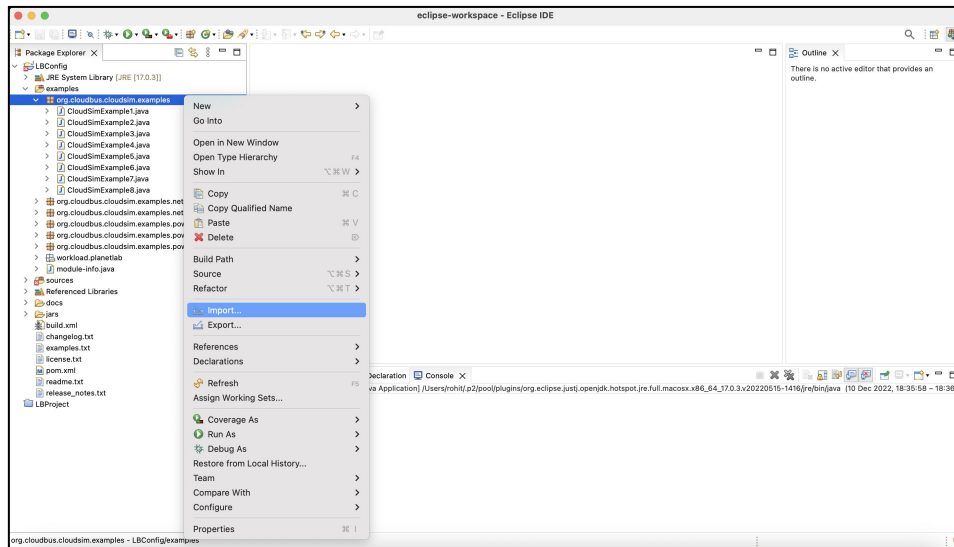
Step 4: Select **"General"** → **"File System"** and click on Next.

Step 5: Click on **"Browse"** and select the folder where the two files are located named **"LBUsingEGA.java"** and **"LBUsingPSO.java"**. Tick the two files and click on **"Finish"**.

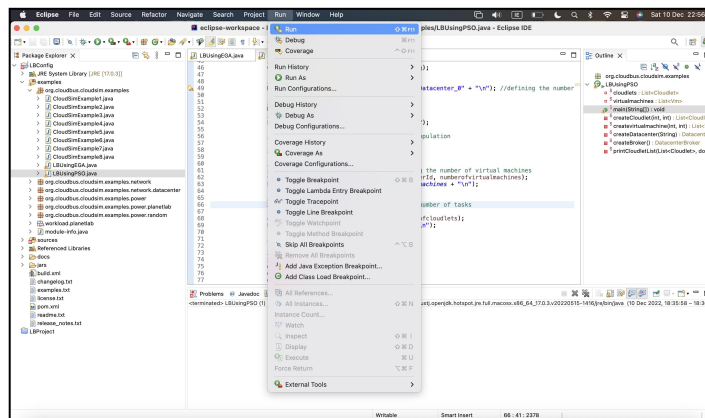**Step 6:** Double click on files to open them.

Step 7: For PSO, open the file and go to line 66. Here you define the number of cloudlets.

Step 8: Click on **"Run"** → **"Run"** to run the code.

Step 9: The results are obtained in **"Console"** tab.

Step 10: Similarly change the number of cloudlets to 75, 100, 125, and 150 respectively and run the simulation to obtain the results for it.

Step 11: Similarly run the code for 50, 75, 100, 125, 150 number of cloudlets for EGA and obtain the results. The below screenshot is the results obtained after simulating for 50 cloudlets.
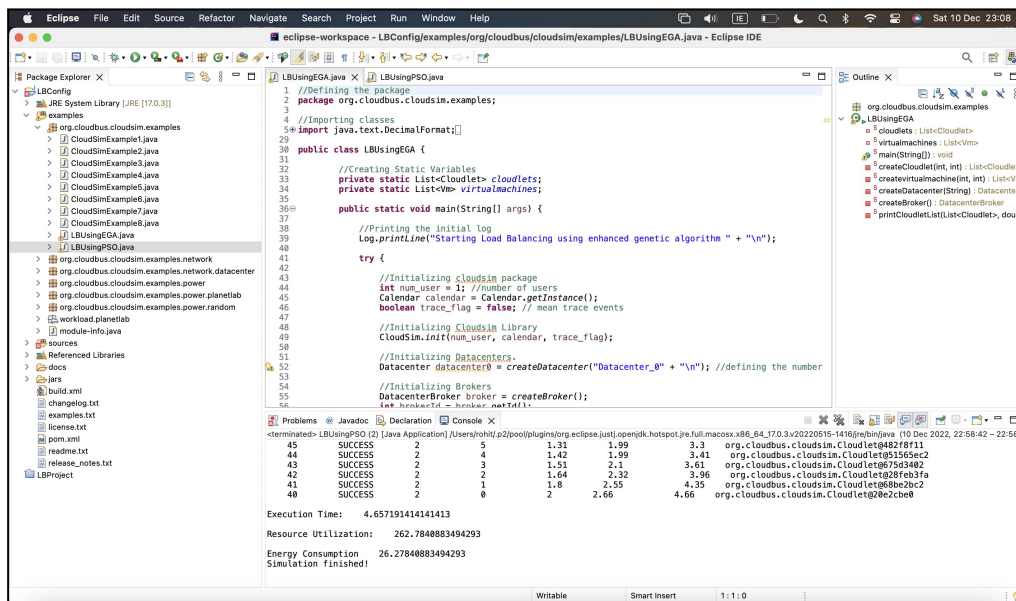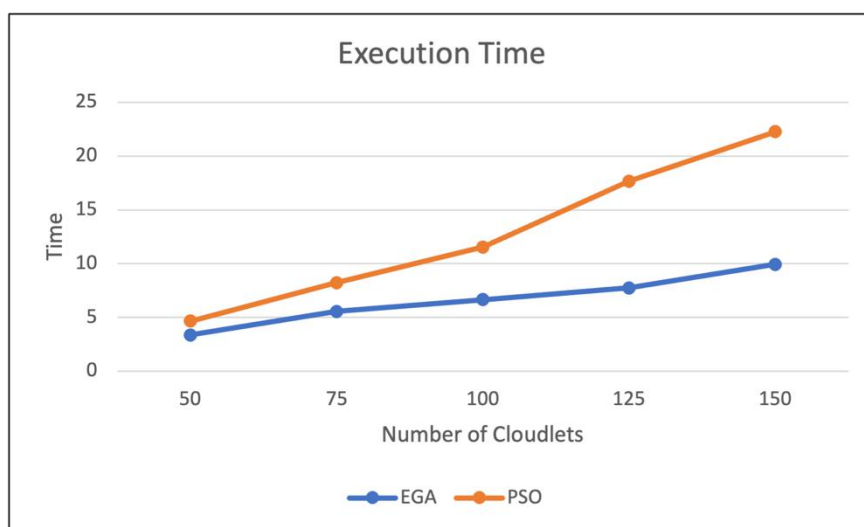

5   Results

After running 5 sets of simulations for both the algorithms for given number of cloudlets, the obtained results are compiled in a Line Graph.
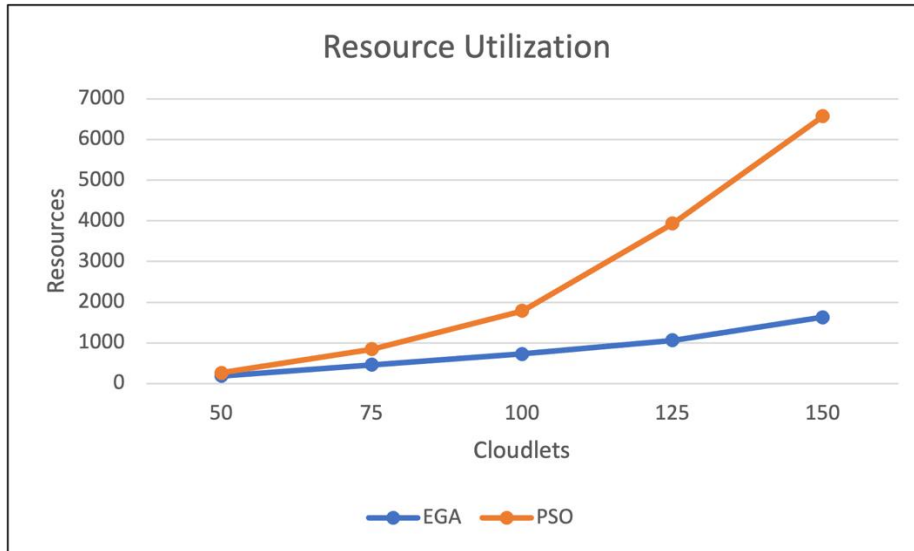
5.1   Execution Time:

The results demonstrated that EGA executes more quickly than PSO.
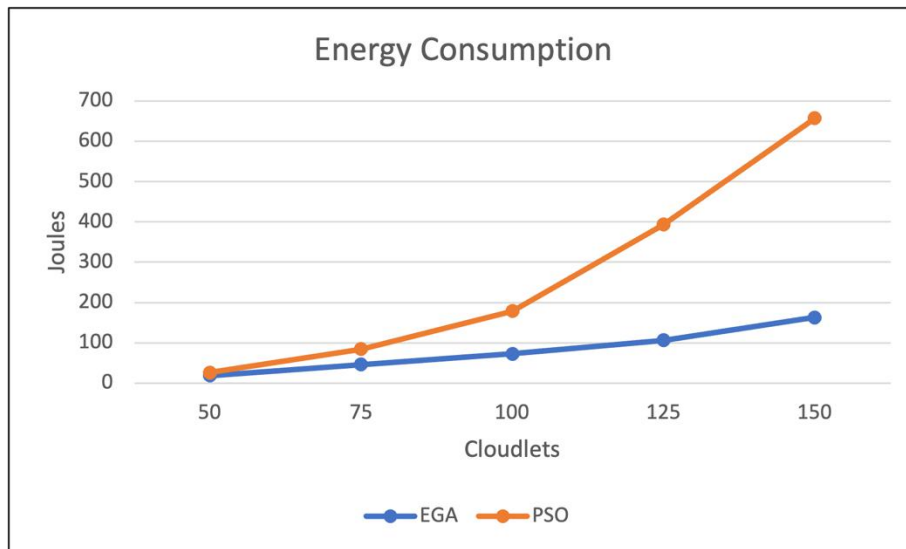
5.2 Resource Utilization

The results show that PSO uses a lot more resources than EGA.

5.3 Energy Consumption

The results demonstrated that EGA consumes less energy than EGA.

References

Cloudslab (no date) *Releases · Cloudslab/cloudsim*, *GitHub*. Available at: https://github.com/Cloudslab/cloudsim/releases (Accessed: December 10, 2022).

Eclipse installer 2022-12 R (no date) *Eclipse Installer 2022-12 R | Eclipse Packages*. Available at: https://www.eclipse.org/downloads/packages/installer (Accessed: December 10, 2022).

Installing the JDK software and setting JAVA_HOME (no date) *Installing the JDK Software and Setting JAVA_HOME (Using the GlassFish ESB Installation CLI)*. Available at: https://docs.oracle.com/cd/E19182-01/820-7851/inst_cli_jdk_javahome_t/#:~:text=a%20Windows%20System-,Install%20the%20JDK%20software.,Program%20Files%5CJava%5Cjdk1. (Accessed: December 10, 2022).