

Configuration Manual

Research Project
MSc Cloud Computing

Zain Ull Abbdin Mohammed
Student ID: x22142169

School of Computing
National College of Ireland

Supervisor: Vikas Sahni

National College of Ireland
Project Submission Sheet
School of Computing



Student Name:	Zain Ull Abbdin Mohammed
Student ID:	x22142169
Programme:	MSc Cloud Computing
Year:	2023
Module:	Research Project
Supervisor:	Vikas Sahni
Submission Due Date:	14/12/2023
Project Title:	Enhanced Genetic Algorithm For Dynamic Dependent Workloads To Improve Load Balancing Efficiency in Cloud Computing
Word Count:	394
Page Count:	8

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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Configuration Manual

Zain Ull Abbdin Mohammed
x22142169

1 Introduction

The steps to implement load balancing with dynamic workload in a simulated environment are listed in this configuration manual.

2 Prerequisites

Below are the prerequisites to install and implement the cloudsim set up.

- Eclipse IDE
- Java JDK 17
- CloudSim 3.0.3 Framework

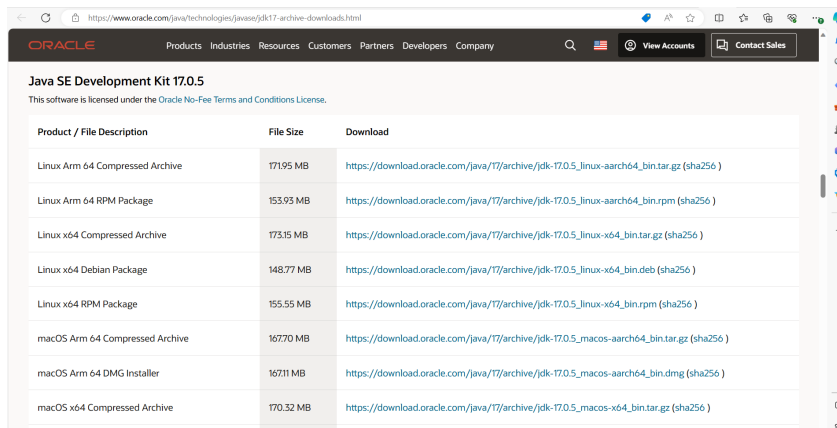
Note: Kindly follow the specific instructions listed for your operating system. This set up was installed and implemented on a Windows 11 machine with 8 GB RAM and 500GB storage.

3 Installation of Prerequisites

3.1 Java JDK 17

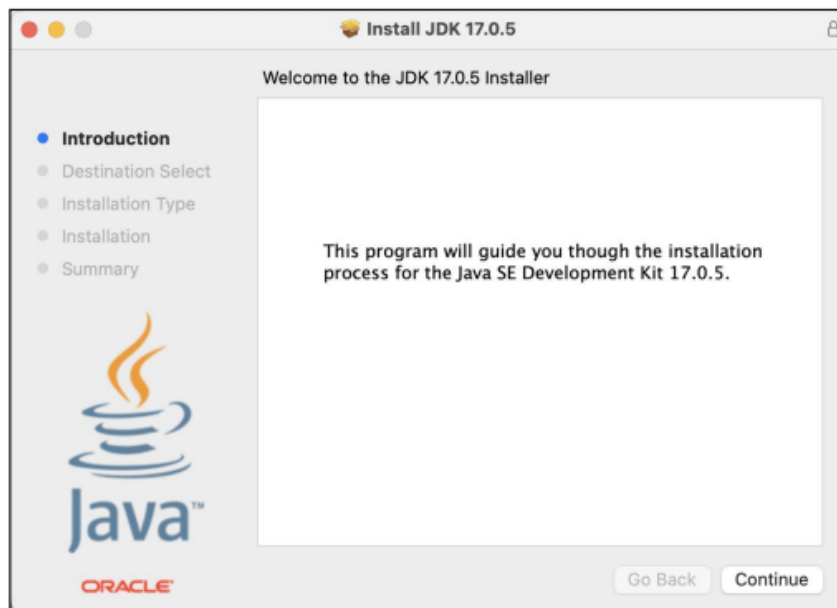
Step 1: For the relevant operating system, download Java JDK 17.0.5.

<https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html>



Product / File Description	File Size	Download
Linux Arm 64 Compressed Archive	17195 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_linux-aarch64_bin.tar.gz (sha256)
Linux Arm 64 RPM Package	153.93 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_linux-aarch64_bin.rpm (sha256)
Linux x64 Compressed Archive	17335 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_linux-x64_bin.tar.gz (sha256)
Linux x64 Debian Package	148.77 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_linux-x64_bin.deb (sha256)
Linux x64 RPM Package	155.55 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_linux-x64_bin.rpm (sha256)
macOS Arm 64 Compressed Archive	16770 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_macos-aarch64_bin.tar.gz (sha256)
macOS Arm 64 DMG Installer	16711 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_macos-aarch64_bin.dmg (sha256)
macOS x64 Compressed Archive	170.32 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_macos-x64_bin.tar.gz (sha256)

Step 2: Run the setup file and install JDK

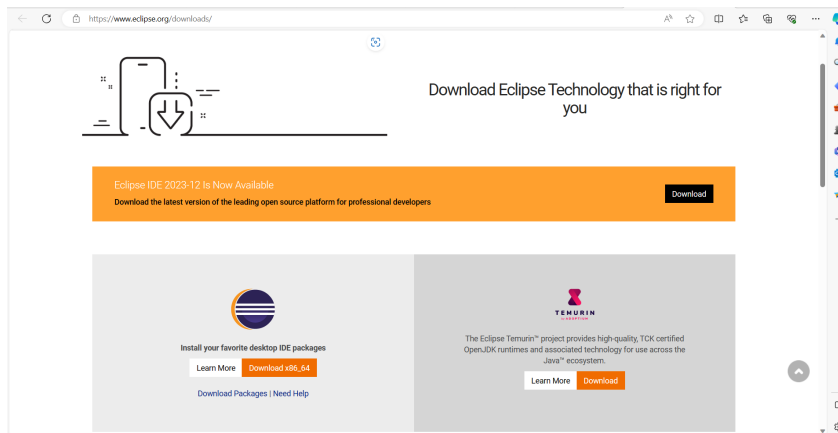


Step 3: Click Install

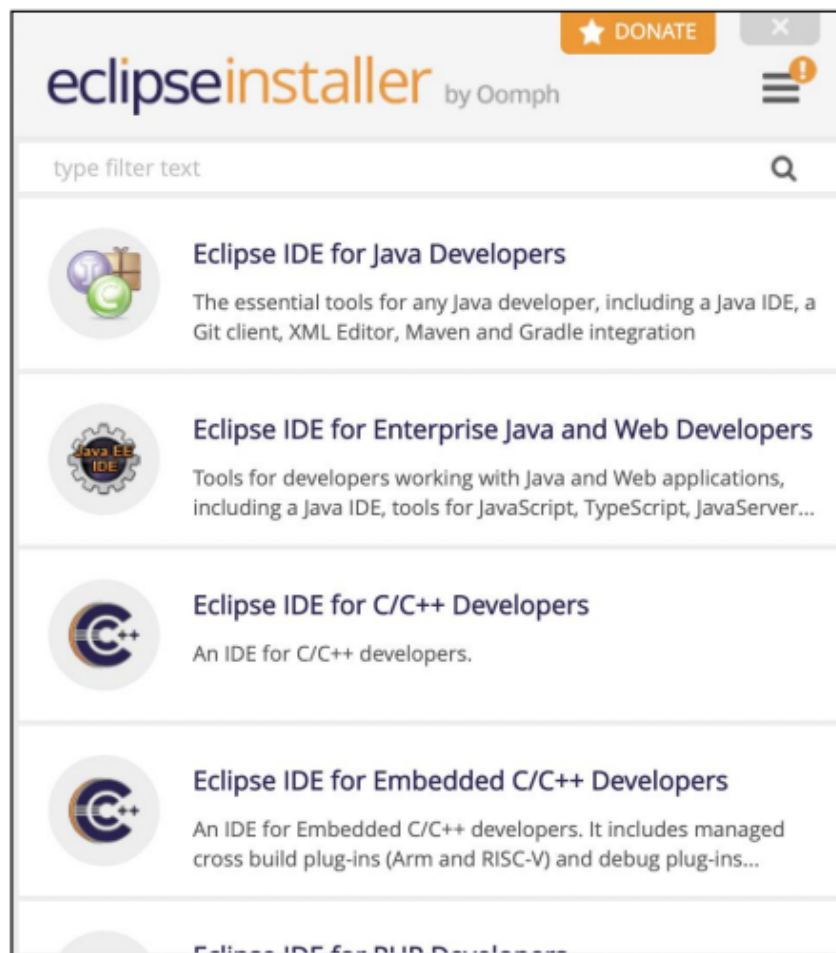


3.2 Eclipse IDE

Step 1: Use the below link to download Eclipse IDE.
<https://www.eclipse.org/downloads/>



Step 2: Choose the "Eclipse IDE for Java Developers" option.



Step 3: Choose the installation folder and the JDK directory where you installed the Java JDK.

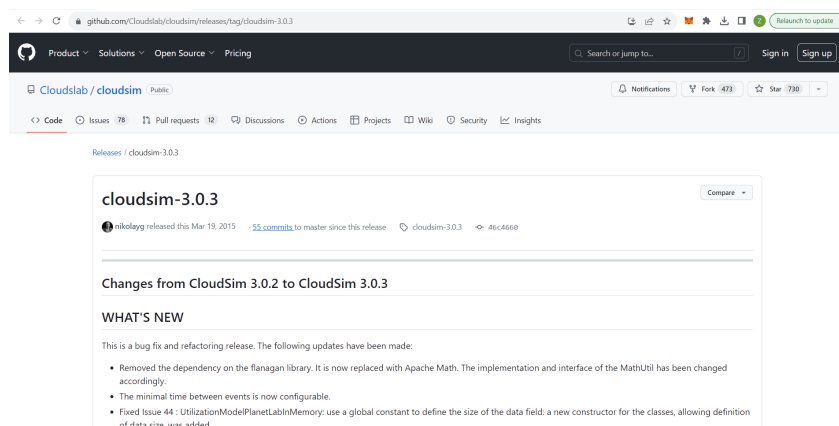
Click "Install"



3.3 CloudSim version 3.0.3

Step 1: Use the below link to download CloudSim

<https://github.com/Cloudslab/cloudsim/releases/tag/cloudsim-3.0.3>

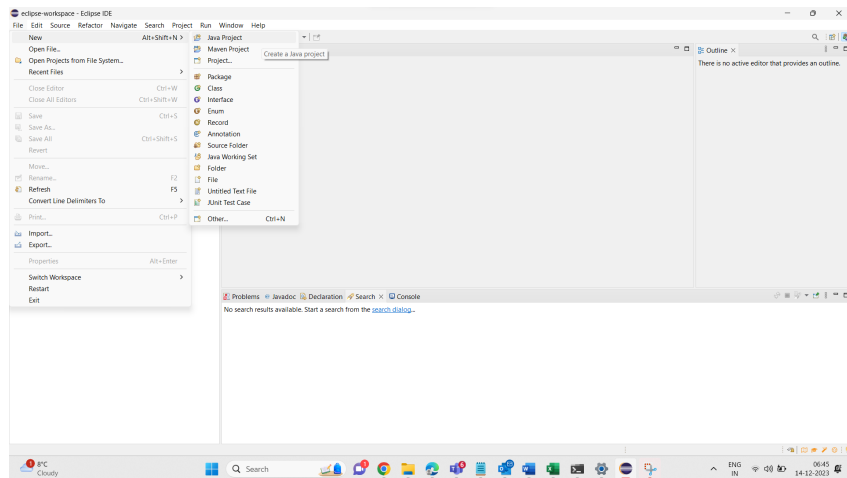


Cloudsim is a simulation tool Goyal et al. (2012).

4 Steps to execute the proposed code

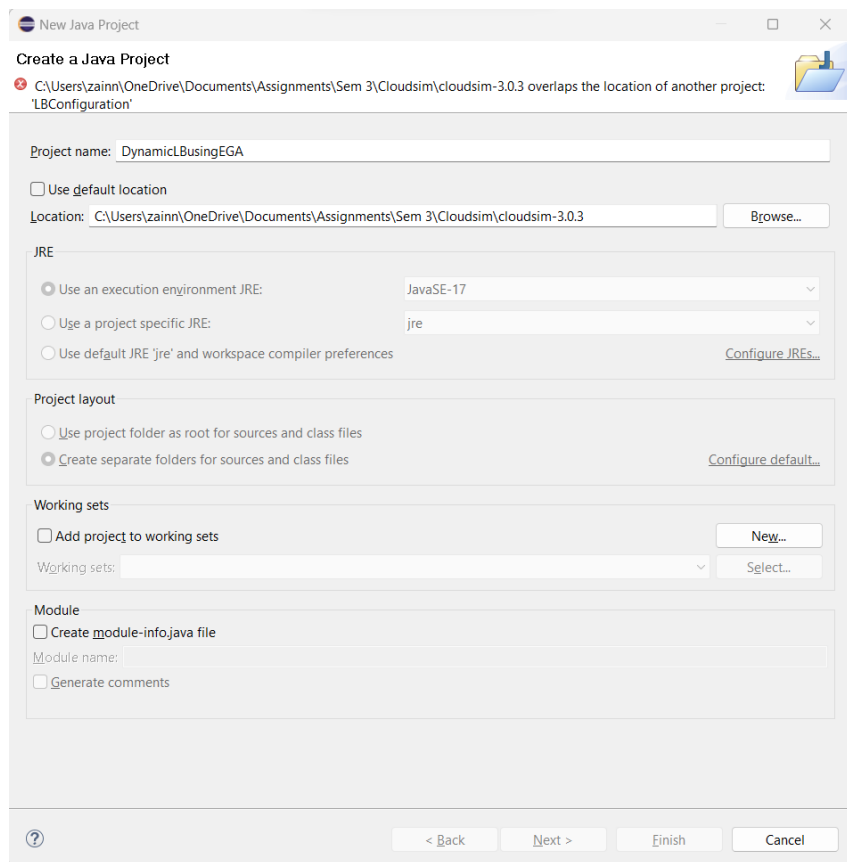
Step 1: Open Eclipse IDE and create a new Java Project.

Click on “File” > “New” > “Java Project”

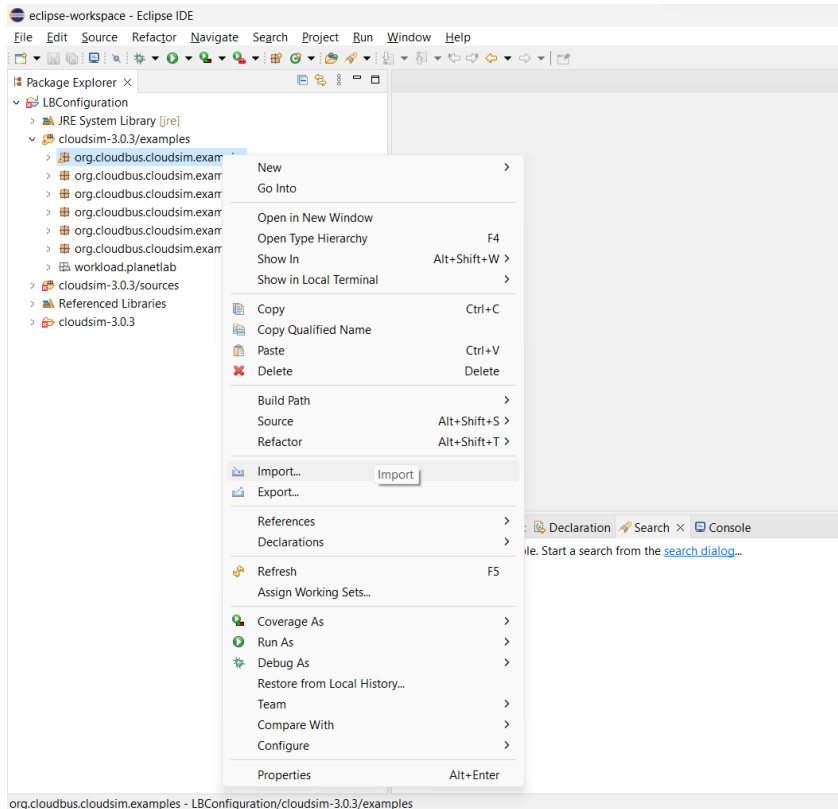


Step 2: Give a project name and uncheck “Use default location” option. Click Browse.

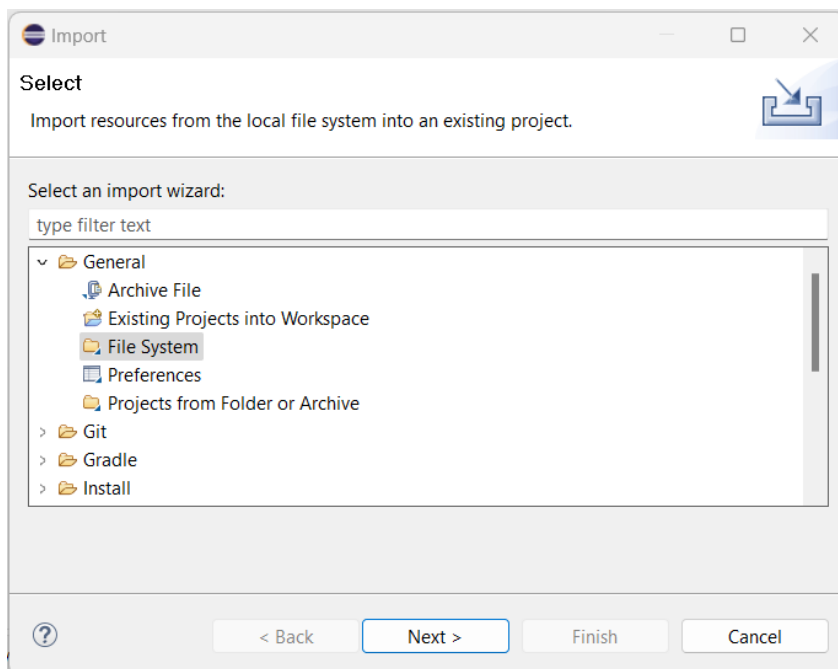
Browse through the path where the clousim is downloaded and click “Finish”.



Step 3: Browse through “Project name” > “cloudsim-3.0.3/examples”, right click on “org.cloudbus.cloudsim.examples” and select “import”.

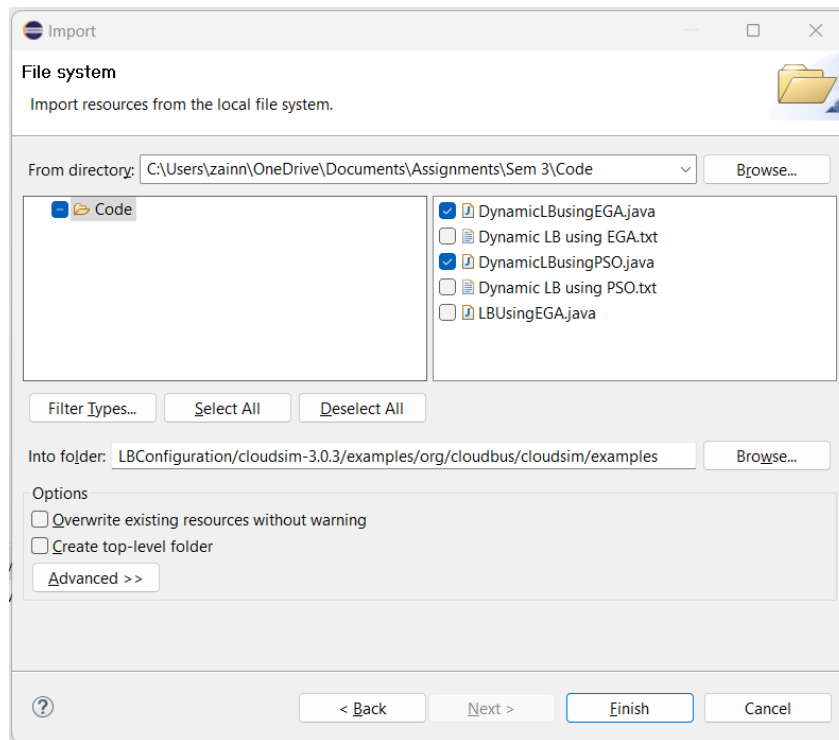


Step 4: Open "General" folder and select "File System" and click "next".

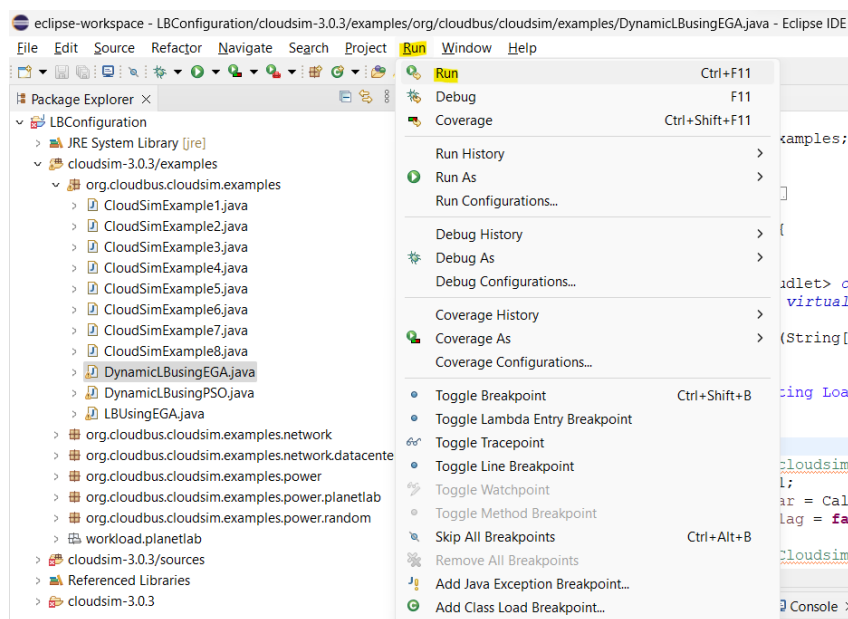


Step 5: Browse through the path where the code files in .java extension are present.

Select the files "DynamicLBUsingEGA.java" and "DynamicLBUsingPSO.java" and click "Finish"



Step 6: Click "Run" > "Run" to execute the program.



The simulation will start and the below outputs are generated.

- Execution Time
- Resource Utilization
- Energy consumption

References

Goyal, T., Singh, A. and Agrawal, A. (2012). Cloudsim: simulator for cloud computing infrastructure and modeling, *Procedia Engineering* **38**: 3566–3572.