National College of Ireland

Configuration Manual

MSc Research Project
Cloud Computing

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MSc Project Submission Sheet

School of Computing

Student Name: …….Poorva Shrivastava

Student ID: ……21216941……..……

Programme: ……MSc Cloud Computing…… **Year:** ……2023

Module: ……MSc Research Project…….……

Lecturer: ……Aqeel Kazmi…….……

Submission Due Date: ……10/12/2023……

Project Title: ……Cost Optimization in Hybrid Cloud Architecture

Word Count: ……887…… **Page Count:** ……11 ……..……..……

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

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1 Introduction

This manual describes how to set up and run the CloudSim-based project, which blends Q-learning with the ACO and HCOC algorithms for comparisons and compares the outcomes for cloud computing simulations. It provides instructions for academics and students on how to install required software and operate the CloudSimACO project.

2 Required Software Tools

The following software tools are required for the CloudSimACO project's execution:

- Eclipse IDE: This tool is used for the implementation of java code for this research project.
- CloudSim Toolkit: A simulation framework for cloud computing environments.
- JDK 17 version: It consists of Java libraries that are required for running the suggested algorithm.

3 Hardware Requirements

- Operating system: Windows/ Mac/ Linux (We can use any OS).
- RAM: Minimum 4GB / 8GB or more than needed.
- Processor: Any Processor from the Intel Core is suitable.

4 Step by Step Software Installation

The steps for the installation of software and tools are shown below.

4.1 JDK Installation

- Java Development Kit (JDK)
- Download JDK 17.0.9 version from the specified Link [1].

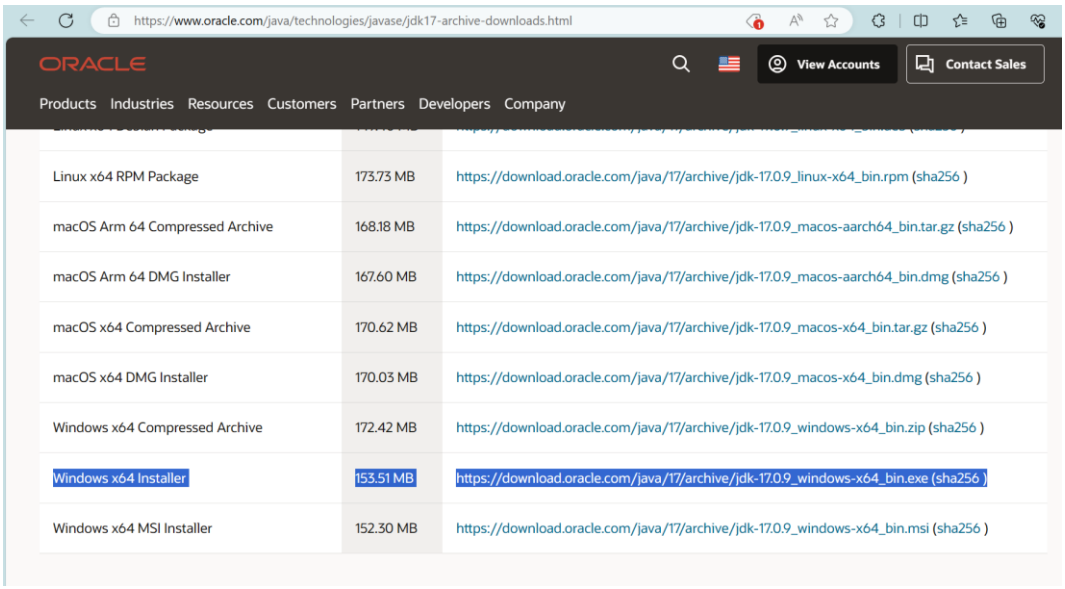


Figure 1: Download Java Development Kit (JDK)

- Install the JDK 17.0.9 Version into the system.

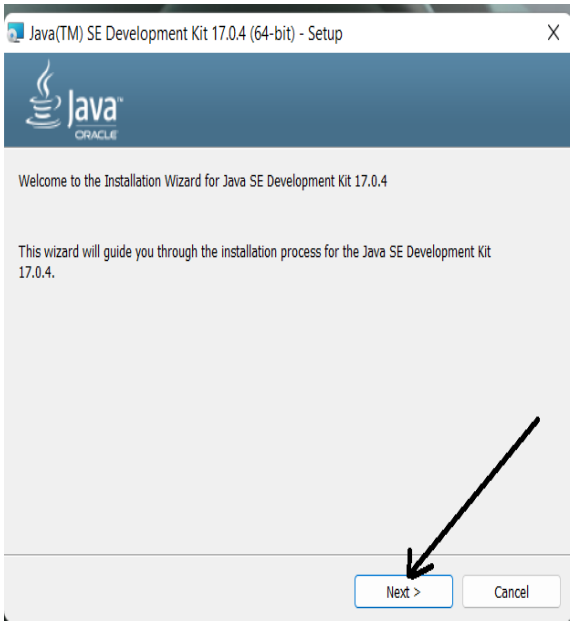


Figure 2: JDK Installation

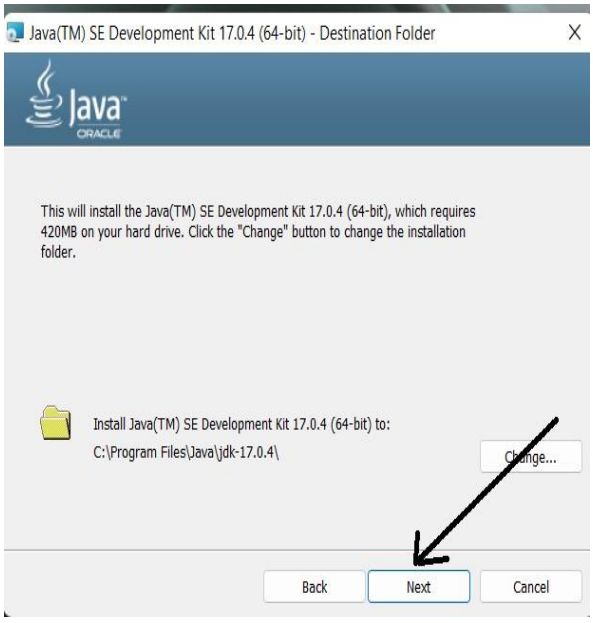


Figure 3: Installation of JDK

4.2 Eclipse IDE Installation

- Download the Eclipse Integrated Development Environment 2022-06 from the given link [2]

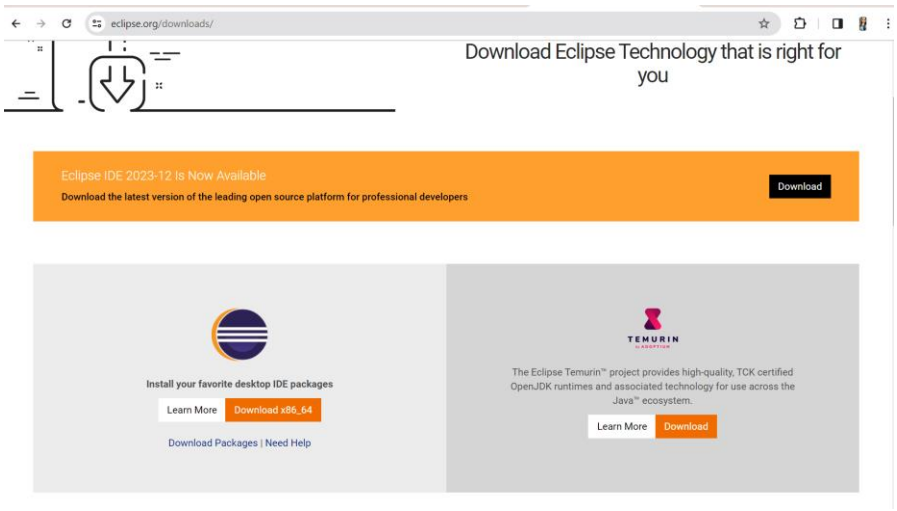


Figure 4:- Download Eclipse

- Install the download Eclipse IDE 2022-06 in system

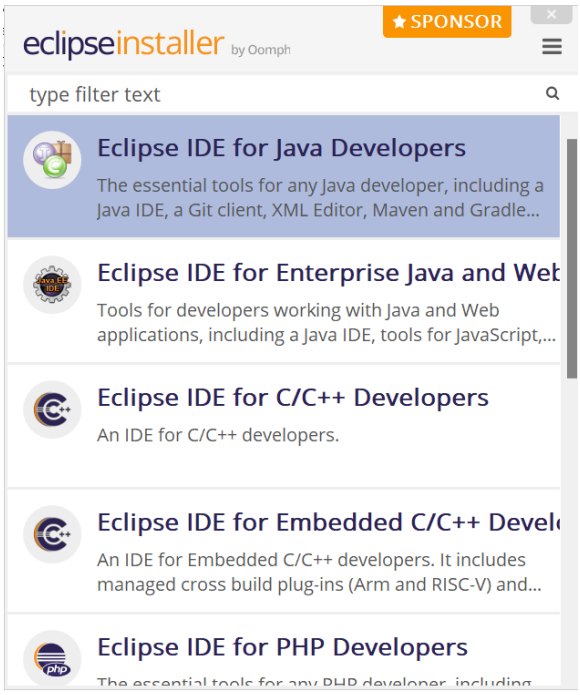


Figure 5: Install Eclipse

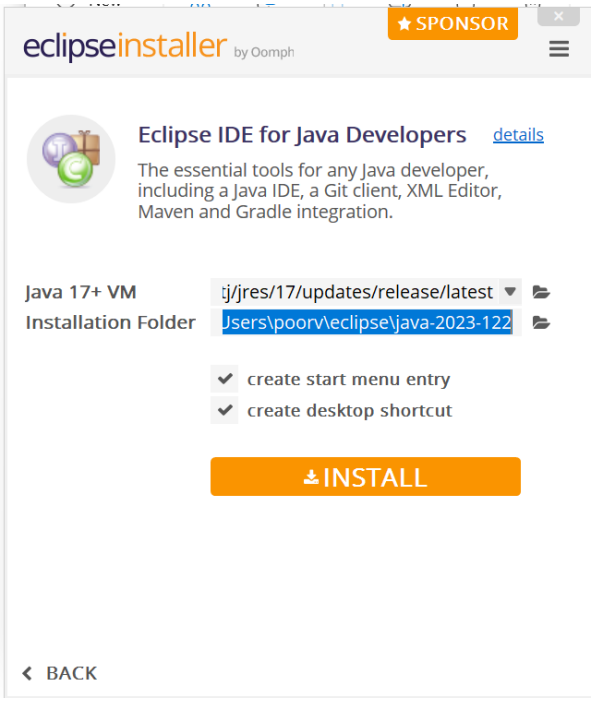


Figure 6: Final step in Eclipse Installation

- Make Sure the java JDK version before installing Eclipse IDE
- Now open the Eclipse and create a workspace.

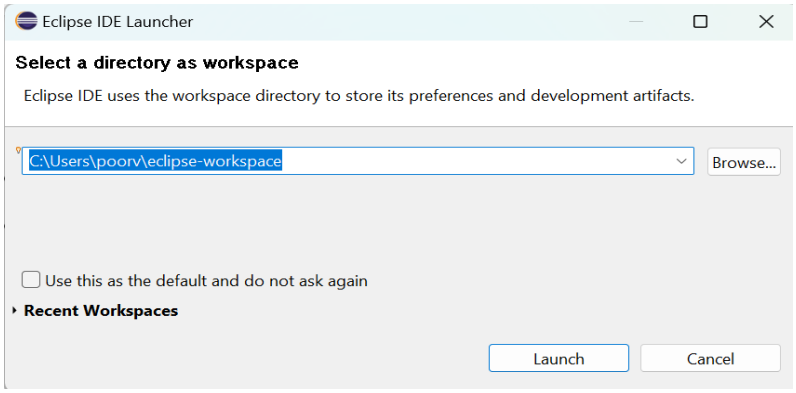


Figure 7:- Workspace Creation for Eclipse IDE

- The created workspace shouldn't be changed. Otherwise, the work done will not be available.
- Now create a new Java project in Eclipse IDE

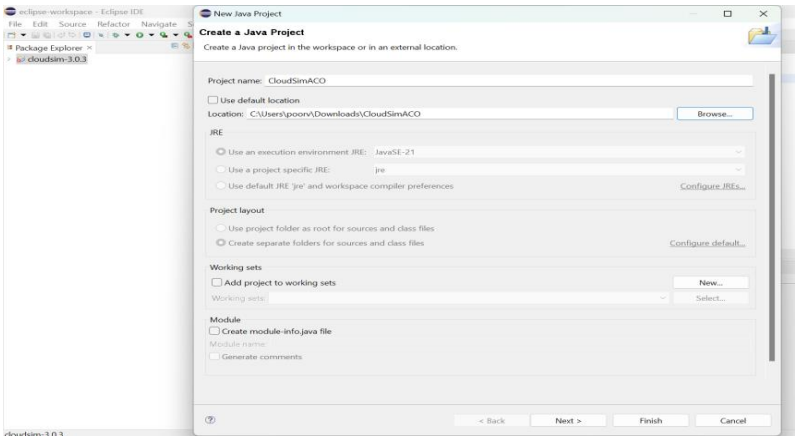


Figure 8: The new project creation in Eclipse IDE

- Make sure the Java Version and name a project of your interest.

4.3 Installation of 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

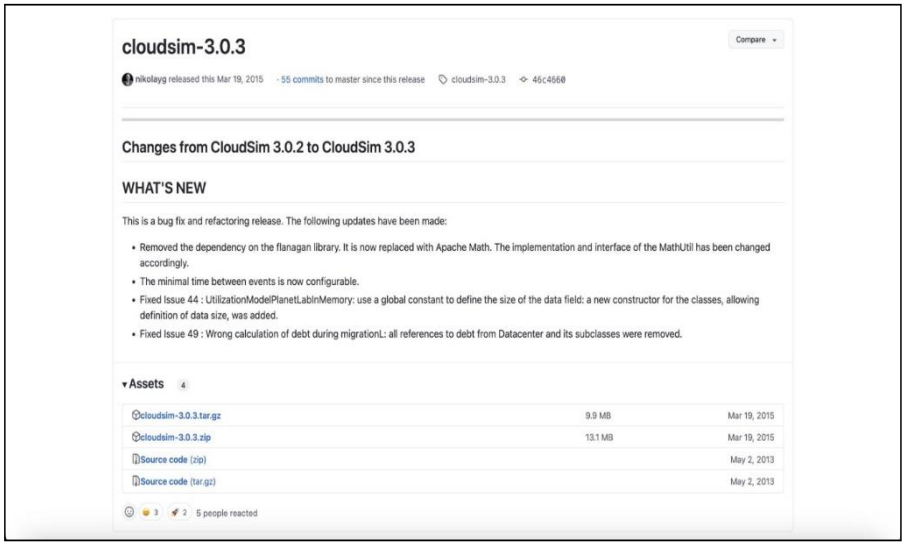


Figure 9: Download the CloudSim

- Importing the downloaded file into Eclipse.

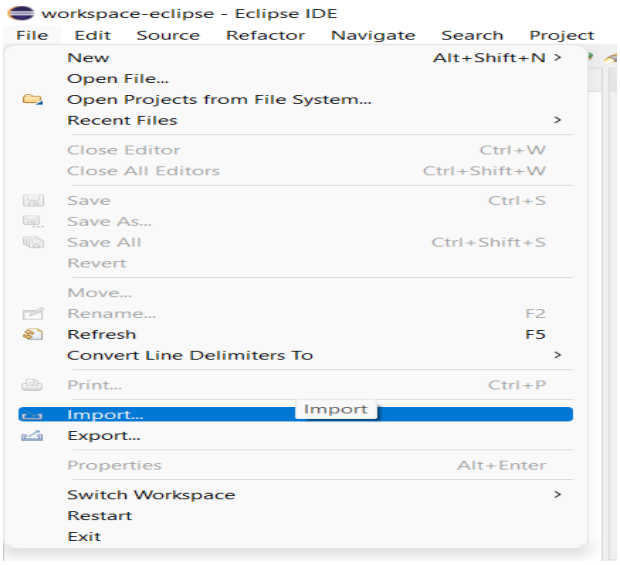
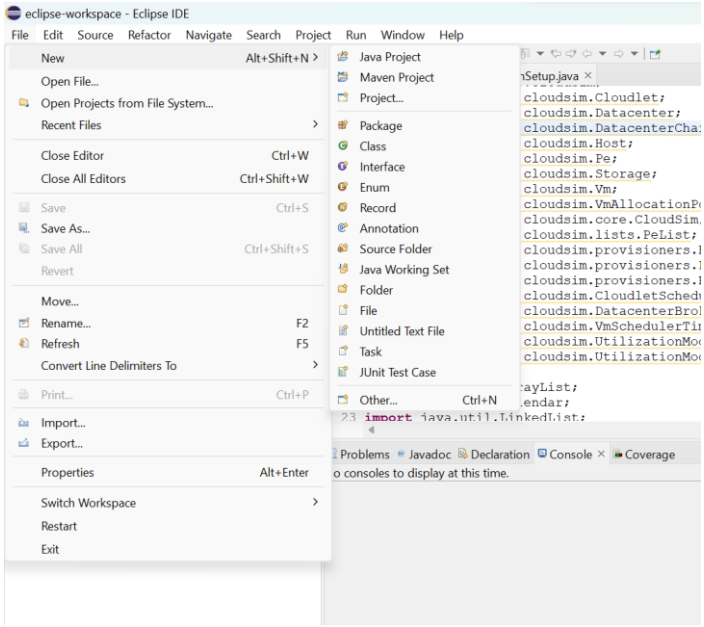


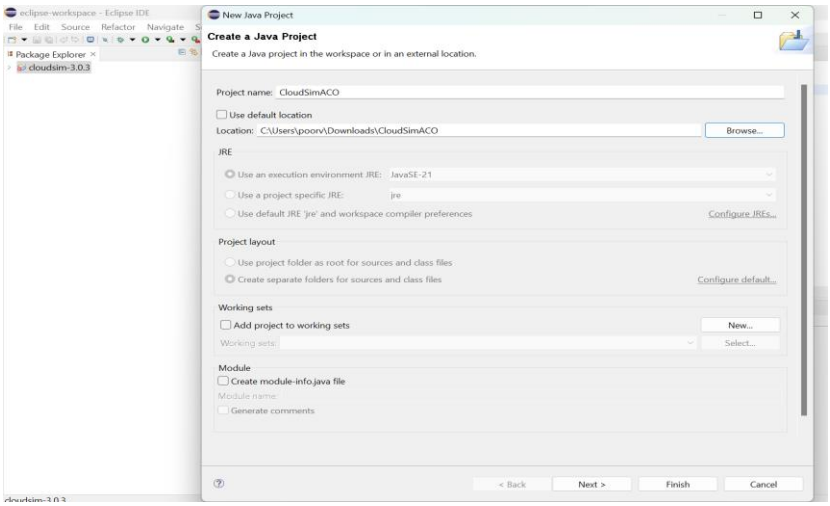
Figure 10: Import option in Eclipse IDE

5 Running the Proposed Algorithm

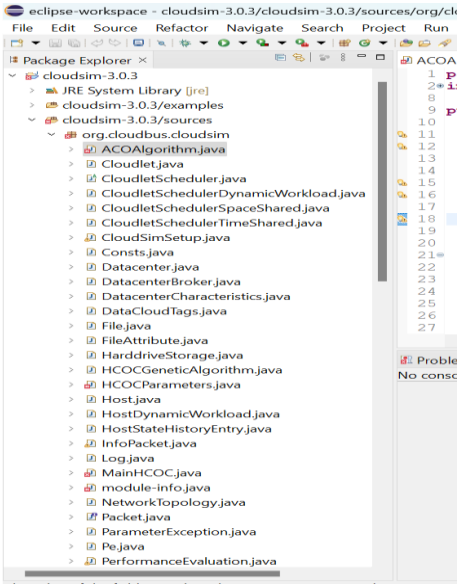
Step 1: To create a new java project, click on **File → New → Java Project**.



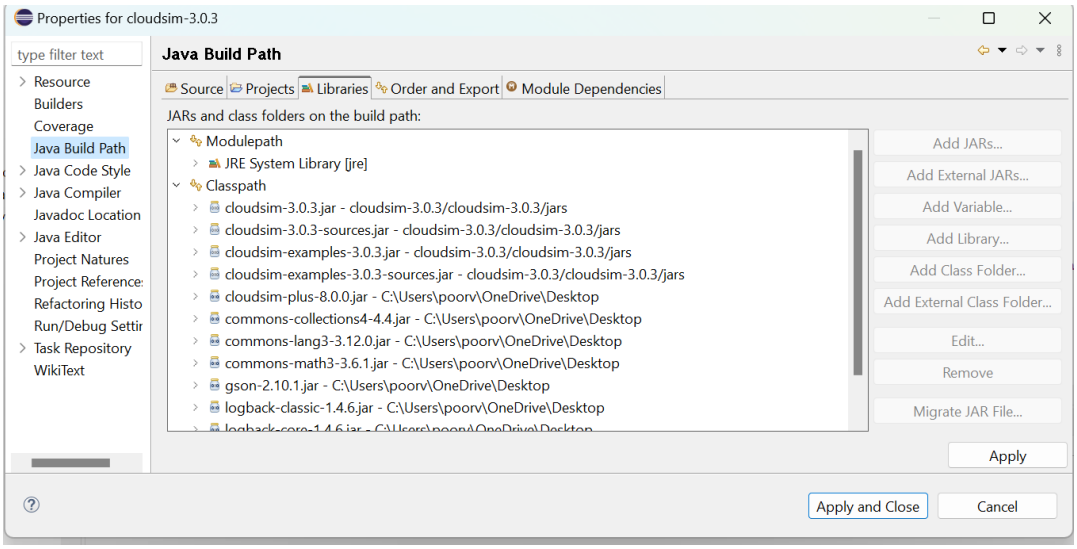
Step 2: Give your project a name in the field **"Project Name"** and untick the option **"Use default location"**. Click on **"Browse"** to select the path where you have downloaded CloudSimv3.0.3. Then click on **"Finish"**.



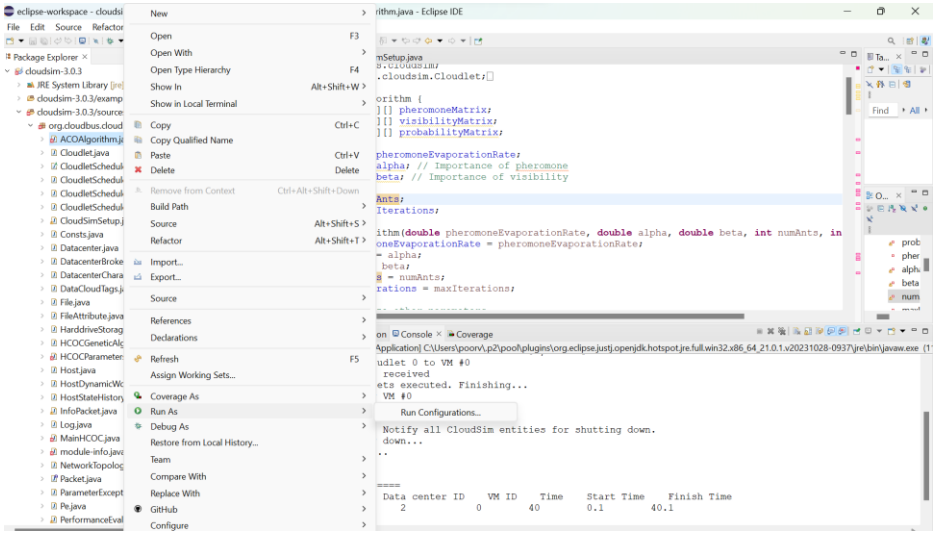
Step 3: Double click on files to open them.



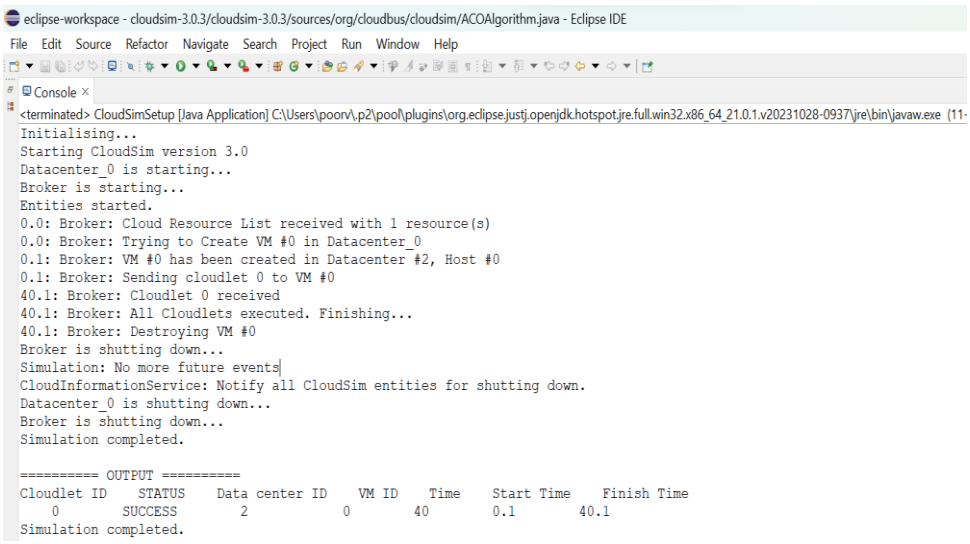
Step 4 : Add the .jar file, open the file and go to properties. Click on Java Build Path and add the required **.jar** files.



Step 5: For running the algorithms, click on the Algorithm file name and run to get the simulation output.



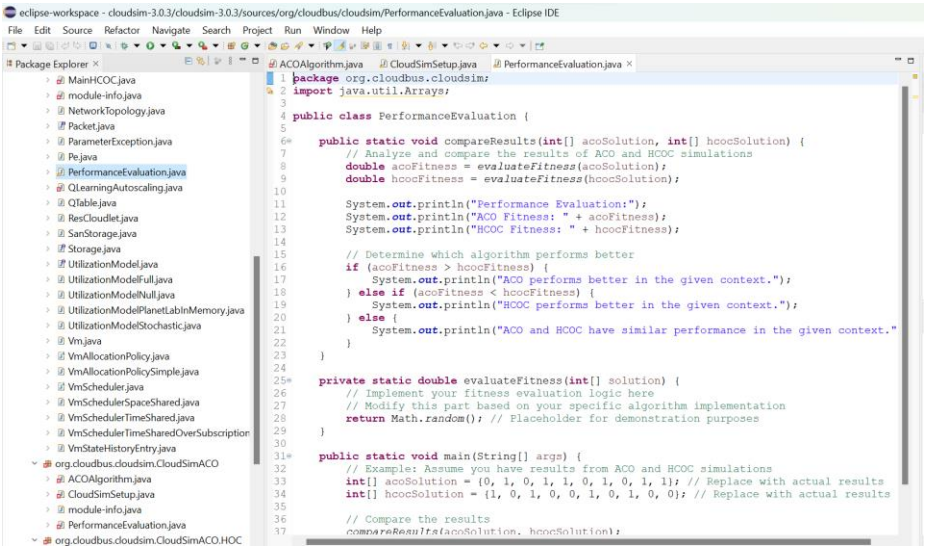
Step 6: The output will be shown in console.



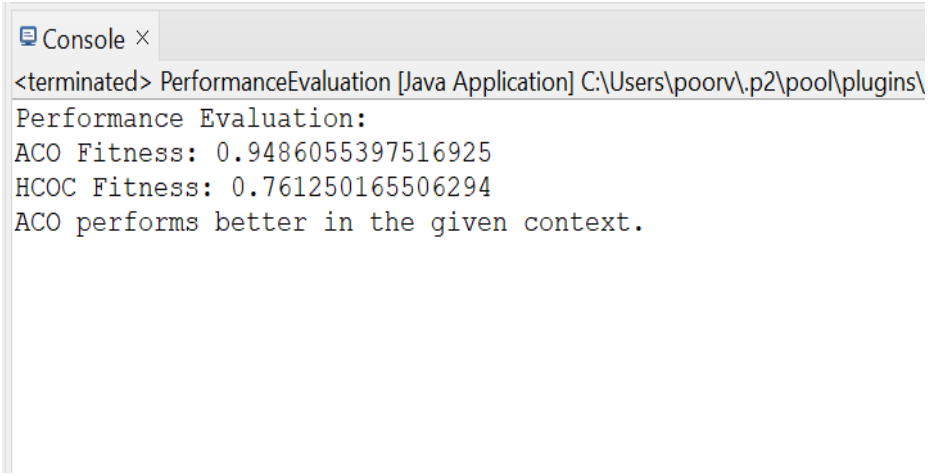
Step 7: Note the execution time for the algorithm by checking the "start time" and "finish time." Repeat the same process by changing number of VMs and Cloudlets in the code.

Step 8: Repeat the same process for another algorithm and note the execution time.

Step 9: Run the Performance Evaluation file which shows the comparison of both the algorithm when integrated with Q-learning.

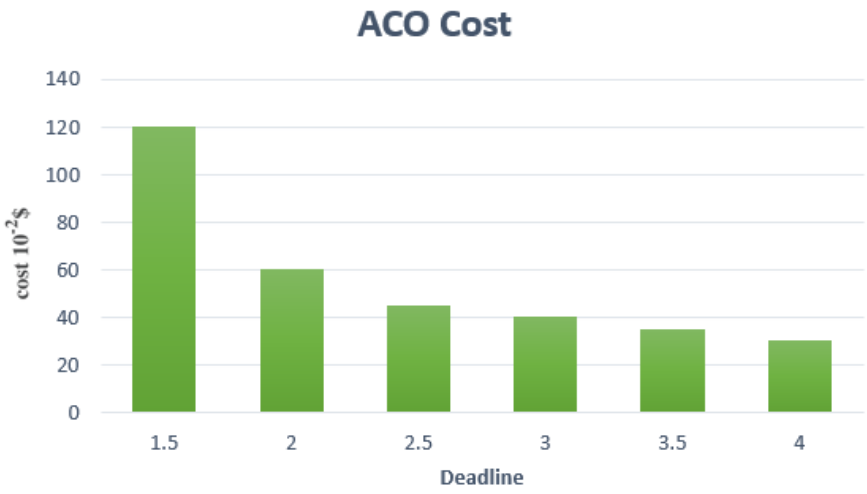


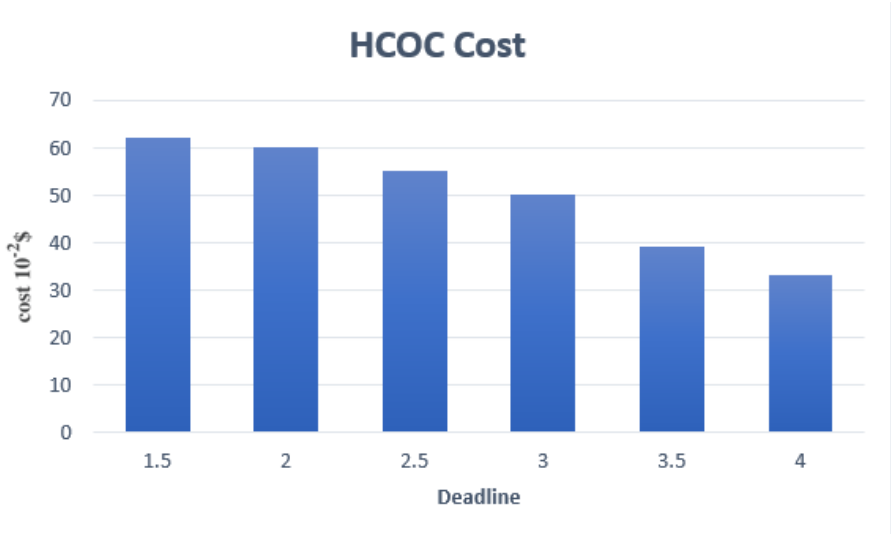
Step 10: The results are obtained in **"Console"** tab.

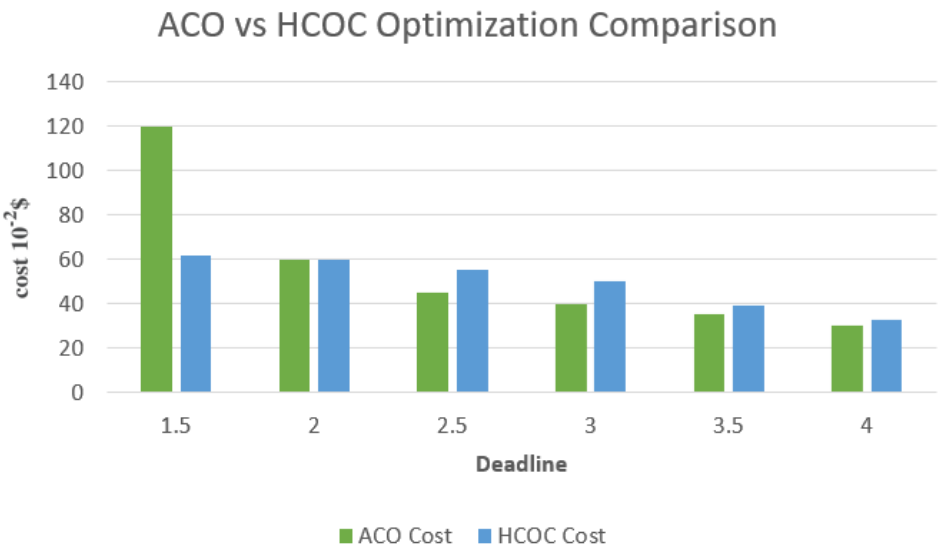


Results

After running simulations for both the algorithms for given number of cloudlets, the obtained average execution time is used for calculating the execution cost of the algorithms. The results are then compiled in Graphs.







References

[1] "Oracle," [Online]. Available: https://download.oracle.com/java/17/archive/jdk-17.0.9_windows-x64_bin.exe (sha256) [Accessed August 2022].

[2] "Eclipse Foundation," Eclipse, [Online]. Available: https://www.eclipse.org/downloads/aca.

[3] "CloudSim: A Framework For Modeling And Simulation Of Cloud Computing Infrastructures And Services," The Cloud Computing and Distributed Systems (CLOUDS) Laboratory, University of Melbourne, [Online]. Available: http://www.cloudbus.org/cloudsim/. [Accessed June 2022].