National College of Ireland

Configuration Manual

MSc Research Project
MSc Cloud Computing

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Project Submission Sheet
School of Computing

Student Name:	Aditi Sulke
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Supervisor:	Prof. Punit Gupta
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Configuration Manual

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1 Introduction

A configuration manual is a document that explains how to set up any specific software, hardware, or any other application and also explains how to configure the setup required. This document is material for users who want to configure the setup and components to ensure that the system works in a defined manner. This manual has a step-by-step description of instructions, what type of settings to use, which versions of software to use, and other important requirements, which helps in assisting the user to get through the process of setup of available configurations. This manual holds all the information about which simulator is used, the programming language used, versions of each software, and the required library.

2 Environment Setup

2.1 System Specification

For this research, the CloudSim Simulator is used. CloudSim is a framework for modeling and simulation of cloud computing infrastructures and services. One can access the open-source version of Cloudsim 3.0.3 on GitHub. From the folder of Cloudsim, the CloudsimExample6.java file is used to get the expected outcome. Since Cloudsim has all the codes written in Java, Eclipse IDE, and JDK are needed. Once you have the results, to visualize them Microsoft Excel is used where graphs can be plotted of required parameters.Sankaran and Subramanian (2021)

2.2 Data Source

To get to know about VM utilisation, execution time is to be calculated. The data which is used as an input is number of VM, number of Cloudlets, number of Datacenters. For getting an idea about real world parameters it's difficult so

2.3 Prerequisites

To understand how the implementation works, one needs a prior understanding of Java Programming language and be used to IDE(Integrated Development Environments) such as Eclipse. It is important to understand fundamentals of Java to get familiar to Cloudsim. Also once the code is executed the graphs are plotted in Microsoft Excel, so for this one needs to be familiar to use Excel Sheet as well.

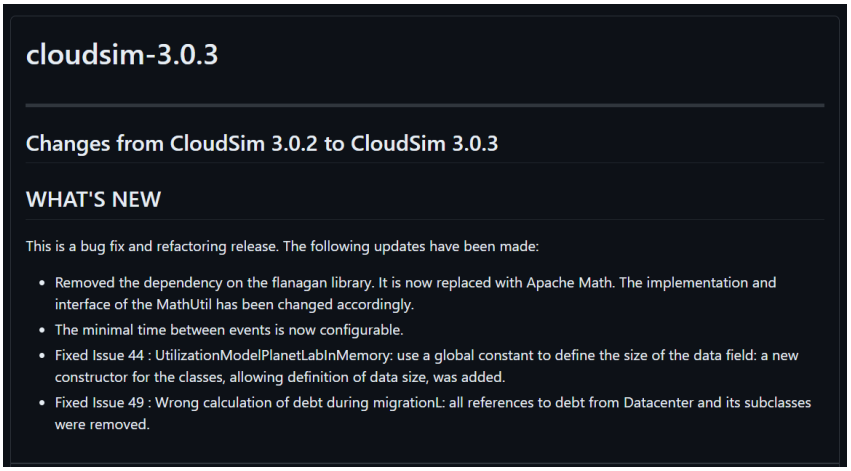

Figure 1: GitHub Cloudsim Download

2.4 Software Tools used

- Eclipse IDE
- Cloudsim
- Microsoft Excel
- JDK (1.8)
- Operation System used: Windows 11
- Processor: i5

3 Software Installation

3.1 Java Installation

Download Java 1.8 from the official website of Oracle.

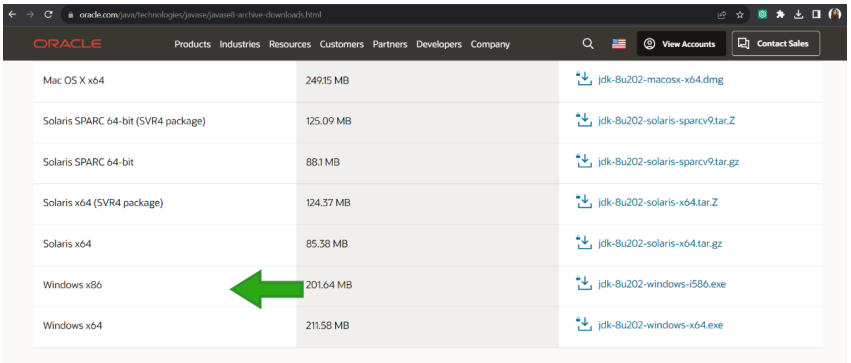

Figure 2: Java installation for Windows

- Install .exe file in the system

- Give the folder path to download and make changes in the system.
- Check all the instructions and click Install.

3.2 Eclipse IDE Installation

Use the mentioned link to download Eclipse:

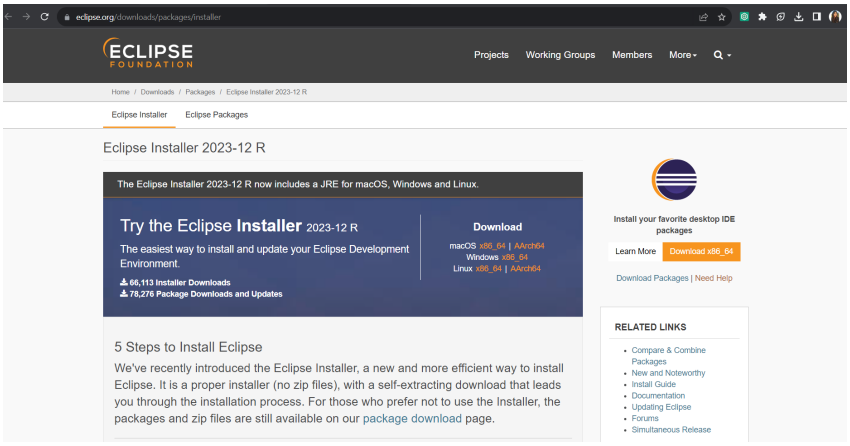

Figure 3: Download Eclipse

Open Eclipse, and import the project.

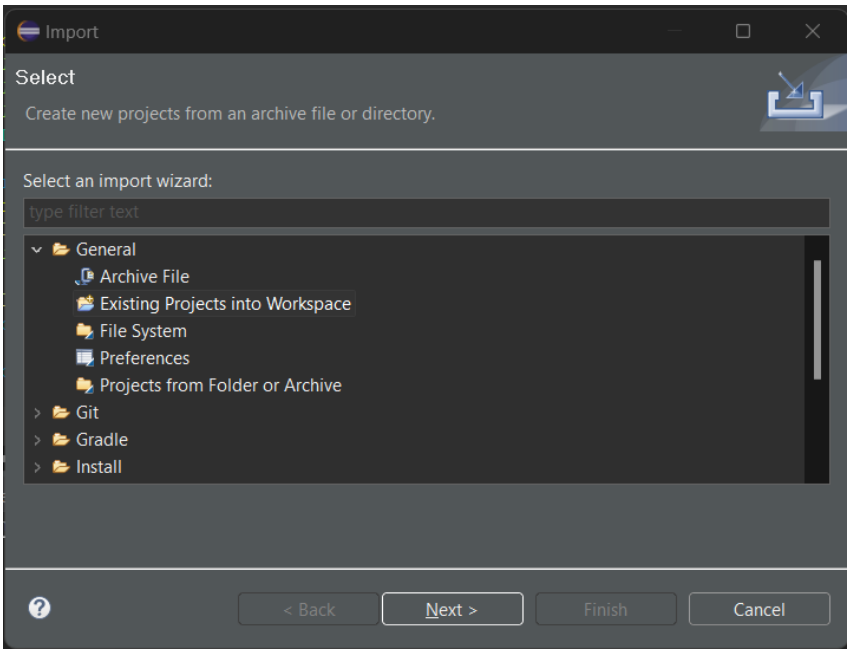

Figure 4: Import any project in Eclipse

3.3 Cloudsim Installation

Since the Cloudsim is downloaded from GitHub, import it to Eclipse IDE.

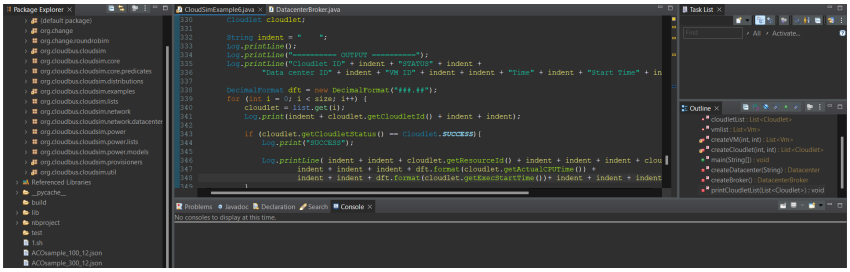

Figure 5: Import Cloudsim

4 File Execution of Project

- Open CloudsimExample6.java file which has the logic to create the number of VMs which are the brokers, number of Cloudlets, and number of datacenters.

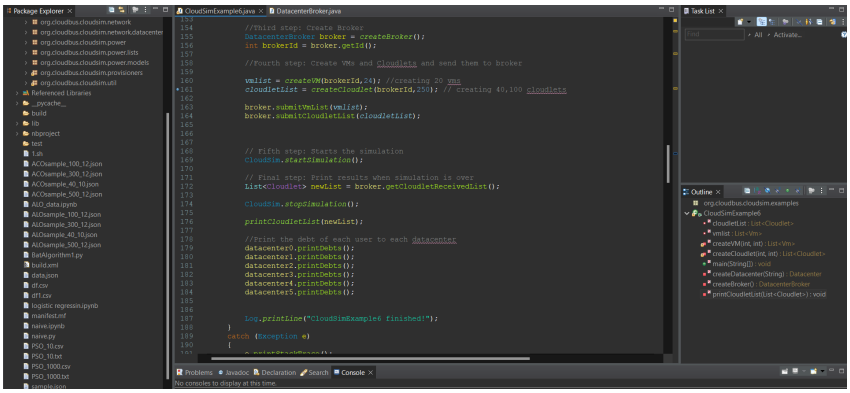

Figure 6: Create brokers, cloudlets and change other specifications

- Execute the file and the data.json file gets created.
- Now, ALO.ipynb and ACO.ipynb are provided in the folder, run those files in Google Collab by first uploading the data.json file.
- Run all the instructions and then a sample.json file will be generated.

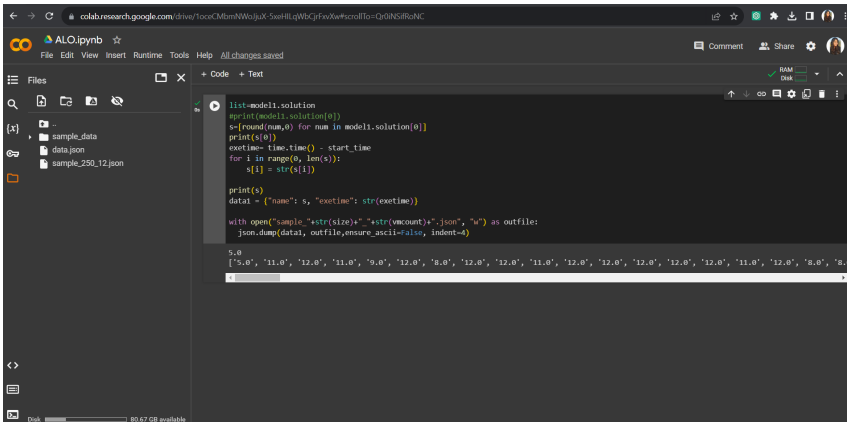

Figure 7: Generating sample.json file

- Import this file to Eclipse IDE and then open and execute the DatacenterBroker.java file, which will give the output data of Task Start time and Task Execution Time.

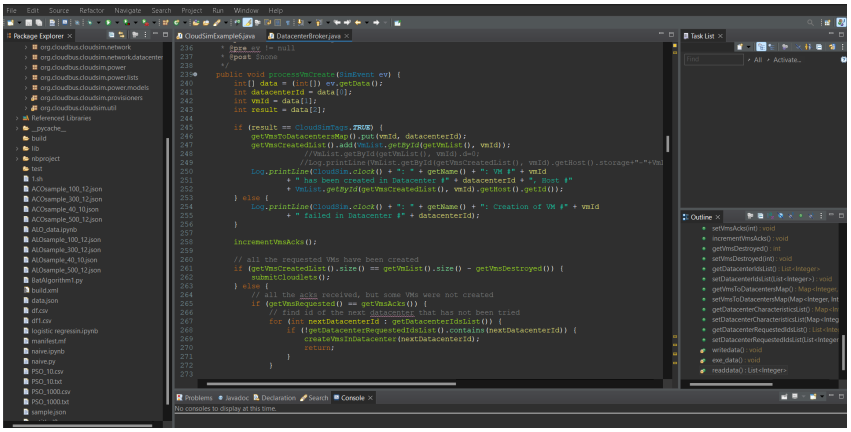

Figure 8: DatacenterBroker.java file to execute

When all the installations and setup instructions are executed, and the required files are executed you have the required out. The major visualization of the result can be seen once a graph is plotted. To do more case studies, parameters can be changed and followed to project instructions in loop and the result of execution time and VM utilization can be obtained.

References

Sankaran, L. and Subramanian, S. J. (2021). Cloudsim exploration: a knowledge framework for cloud computing researchers, *Applied Soft Computing and Communication Networks: Proceedings of ACN 2020*, Springer, pp. 107–122.