

Configuration Manual

MSc Research Project MSc. Cloud Computing

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MSc Project Submission Sheet

	School of Computing		
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Student Name:			
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Student ID:	MSc. Cloud Computing		2023-2024
Programme:	MSc. Research Project	Year:	
Module:			
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Lecturer:			
Submission Due Date:	12 th August, 2024		
	Enhancing Load Balancing Efficiency In Dyna	mic	
Project Title:	Workload Environments Using Enhanced Gen Algorithm and Machine Learning	etic	
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Word Count:	Page Count:		

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Configuration Manual

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1 Introduction

The steps to implement load balancing with Enhanced Genetic Algorithm, CloudSim along with the steps to implement Machine Learning models on Azure Cloud have been listed in this configuration manual.

2 **Prerequisites**

Below are the prerequisites to implement Enhanced Genetic Algorithm with CLoudSim setup.

- Eclipse IDE
- Java JDK 17
- CloudSim 3.0.3 Framework

Note: This was setup was done and installed on a device with Windows 11 as the Operating System with 16 GB of RAM and 512 GB SSD storage.

Below are the prerequisites to implement and train the Machine Learning models on Azure Cloud.

- Azure Cloud Subscription
- Azure ML Studio subscription
- Azure ML Resource Group and workspace

Note: This was implemented using a Azure Student Account subscription provided by the National College of Ireland, Dublin.

3 Installation of the Setup

3.1 Java JDK 17

Step 1: For the system's operating system, download the JDK version 17.0.5 URL: <u>https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html</u>

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	macOS Arm 64 Compressed Archive	167.70 MB	https://download.oracle.com/java/17/archive/jdk-17.0.5_macos-aarch64_bin.tar.gz (sha256)
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	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

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This will install the Java(TM) SE Development Kit 17.0.5 (64-bit), which requires 420MB on your hard drive. Click the "Change" button to change the installation folder.	
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3.2 Setup Eclipse IDE and CloudSim

Step 1: Download and install the setup file for Eclipse IDE for Java Developers (4.32.0)

URL:	https://	www.eclipse.org/	downloads/	/
				_



Step 2: Using the below link of GitHub repository, CloudSim can downloaded on the system.

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



4 Steps for Executing the EGA and ML models

4.1 Part-1 EGA

Step 1: Open Eclipse IDE and create a new Java Project. Click on File > New > Java Project

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Create a Java Project Create a Java project in the workspace or ir						
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Working sets -					Ne <u>w</u> Select	
Module Create module-info.java file Module name: Generate comments						
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The "Location" of the project should be same as the one where CloudSim has been installed in the system.

Step 2: Navigate through Project Name > Examples > org.cloudbus.cloudsim.examples and select the option "import"



Step 3: Import the file "DynamicLBUsingEGA.java" as a File System and browse through the path where the .java file is stored on the Local System

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Step 4: Click Run > Run to execute the Algorithm

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4.2 Azure ML Studio

Step 1: Access the Azure Cloud Portal via the URL: https://portal.azure.com/ and Access the Azure ML Studio service

-> Create an Azure Machine Learning Workspace by defining the necessary parameters

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Step 2: Access the created workspace and launch the "Studio Web URL" to access the Azure ML Studio

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Page 1 V of 1 >	resource/habscriptions/444ecd75	Work with voi	ur models in Azure Machine Learning Studio		

Step 3: Create a .ipynb notebook and upload the dataset .csv file to the same folder

-> Select the "Serverless Spark Compute" to configure and initialize sessions computing resources

-> Execute each cell individually or all at once to obtain the results

Azure AI Machine Learning Studio						
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