



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment 1.3

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Subject Name: Cloud Computing & Distributed Systems

UID: 21BCS1956
Section/Group: CC-615-B
Subject Code: 21CSP-378
Semester: 6

1. Aim:

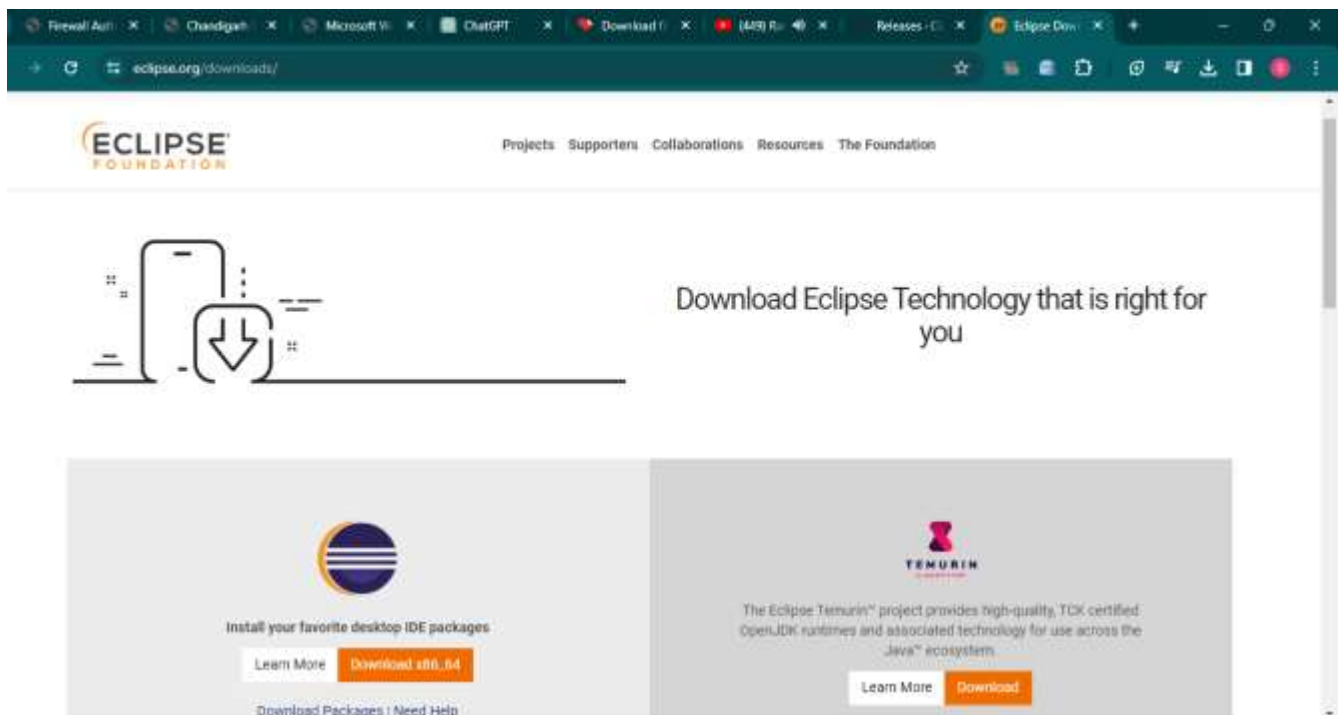
To Installation of Cloud Sim tool and IDE.

2. Objective:

To Install Cloud Sim tool and IDE within the virtual machine.

3. Steps to Install:

Step 1: Open the Browser and search the Java IDE for the install and the cloud-sim tool for execute .





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Step 2: After the open the Browser in the System, and search cloud sim 3.03 go to the GitHub link and download the [cloudsim-3.0.3.zip](https://github.com/Cloudlab/cloudsim/releases/download/v3.0.3/cloudsim-3.0.3.zip)

The screenshot shows the GitHub release page for CloudSim 3.0.3. The page title is "cloudsim-3.0.3". Below the title, it says "Changes from CloudSim 3.0.2 to CloudSim 3.0.3". Under the heading "WHAT'S NEW", it states: "This is a bug fix and refactoring release. The following updates have been made:"

- Removed the dependency on the flanagan library. It is now replaced with Apache Math. The implementation and interface of the MathUtil has been changed accordingly.
- The minimal time between events is now configurable.
- Fixed Issue 44 : UtilizationModelPlanetLabinMemory: use a global constant to define the size of the data field: a new constructor for the classes, allowing definition of data size, was added.
- Fixed Issue 49 : Wrong calculation of debt during migration!: all references to debt from Datacenter and its subclasses were removed.

Below the "WHAT'S NEW" section, there is a section for "Assets". It contains two assets:

Asset	Size	Downloaded
cloudsim-3.0.3.tar.gz	9.9 MB	Mar 19, 2015
cloudsim-3.0.3.zip	13.1 MB	Mar 19, 2015

Step 3: Now download the Common Math library from the Apache Commons website i.e. [commons-math3-6.1-beta1-bin.zip](https://commons.apache.org/math/download-binaries.cgi)

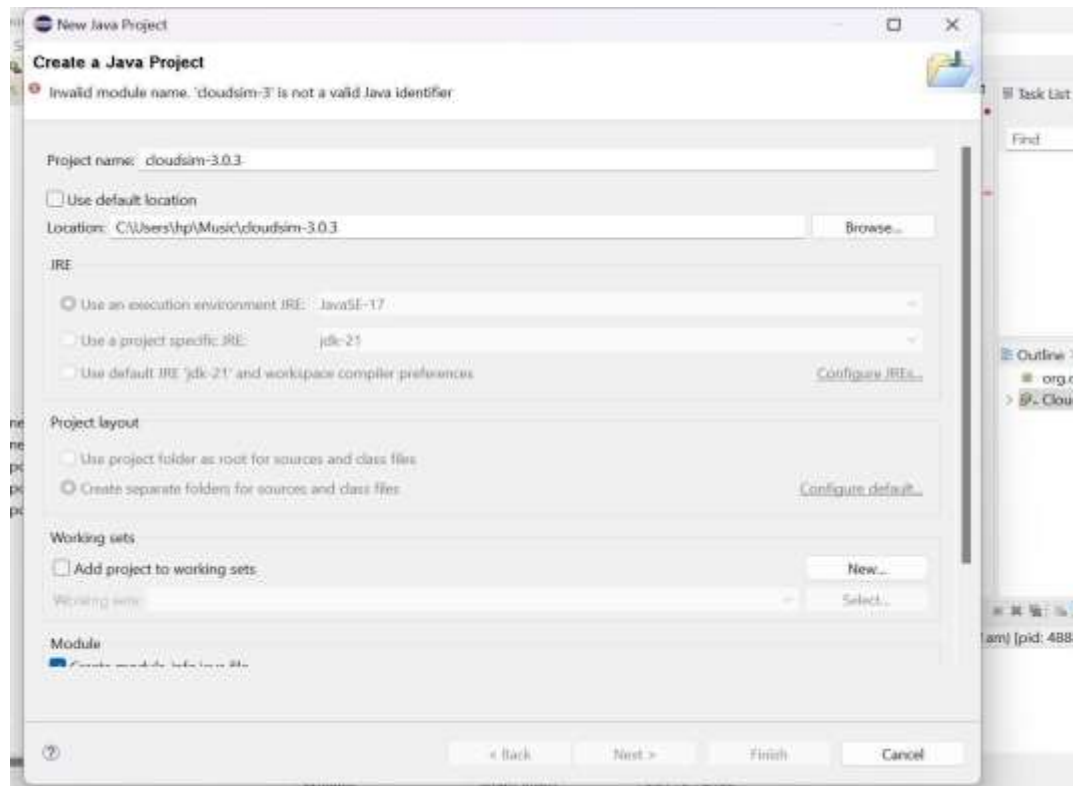
The screenshot shows the Apache Commons Math 3.6.1 API documentation. The page title is "Apache Commons Math 3.6.1 API". The left sidebar shows a list of packages and classes. The main content area shows a table of packages and their descriptions.

Package	Description
org.apache.commons.math3	Common classes used throughout the commons-math library
org.apache.commons.math3.analysis	Parent package for common numerical analysis procedures, including root finding, function interpolation and integration
org.apache.commons.math3.analysis.differentiation	This package holds the main interfaces and basic building block classes dealing with differentiation
org.apache.commons.math3.analysis.functions	The function package contains function objects that wrap the methods contained in Math, as well as common mathematical functions such as the gaussian and sinc functions
org.apache.commons.math3.analysis.integration	Numerical integration (quadrature) algorithms for univariate real functions
org.apache.commons.math3.analysis.integration.gauss	Gauss family of quadrature schemes
org.apache.commons.math3.analysis.interpolation	Univariate real functions interpolation algorithms
org.apache.commons.math3.analysis.polynomials	Univariate real polynomials implementations, seen as differentiable univariate real functions
org.apache.commons.math3.analysis.solvers	Root finding algorithms, for univariate real functions
org.apache.commons.math3.complex	Complex number type and implementations of complex transcendental functions
org.apache.commons.math3.dfp	Decimal floating point library for Java
org.apache.commons.math3.distribution	Implementations of common discrete and continuous distributions
org.apache.commons.math3.distribution.fitting	Fitting of parameters against distributions
org.apache.commons.math3.exception	Specialized exceptions for algorithms errors
org.apache.commons.math3.exception.util	Classes supporting exception localization
org.apache.commons.math3.filter	Implementations of common discrete-time linear filters
org.apache.commons.math3.fitting	Classes to perform curve fitting
org.apache.commons.math3.fitting.leastsquares	This package provides algorithms that minimize the residuals between observations and model values
org.apache.commons.math3.fraction	Fraction number type and fraction number formatting

Step 4: After the install the eclipse.exe file and cloudsim.zip the execute the .exe in the virtual machine and extract the cloud-sim zip file in the virtual machine .



Step 5: Open the Eclipse and create the new project in the virtual machine.



Step 5: Click on Next, then go to libraries , Add external JARs and add the JAR file from the common math package downloaded from apache website and then click on finish.

The screenshot shows the Eclipse IDE with the following components:

- Package Explorer (Left):** Displays the project structure, including the `org.cloudsim.examples` package and the `CloudSimExample1.java` file.
- Task List (Right):** Shows a list of tasks, including `CloudSimExample1.java`.
- Outline (Bottom Right):** Shows the class structure of `CloudSimExample1`, including `CloudSimExample1`, `CloudSimExample1Host`, `CloudSimExample1Server`, and `CloudSimExample1Datacenter`.
- Code Editor (Center):** Displays the source code of `CloudSimExample1.java`. The code includes a package declaration, imports, class definition, and a main method that simulates a data center with multiple hosts and servers.

The screenshot displays the Eclipse IDE interface for a Java project named 'cloudsim-examples'. The Package Explorer on the left shows the project structure, with 'CloudSimExample1.java' selected. The main editor shows the code for 'CloudSimExample1.java', which includes package imports, class annotations, and the main method. The Console on the right shows the output of the simulation, including the start of the CloudSim version 3.0, the creation of a Datacenter_0, and the execution of 400 cloudlets. The bottom status bar indicates the current workspace is 'Workspace' and the host is 'Brecht Host'.

```

1  package org.cloudsim.examples;
2
3  import java.util.ArrayList;
4  import java.util.List;
5  import java.util.Random;
6  import java.util.concurrent.TimeUnit;
7  import org.cloudsim.core.CloudSim;
8  import org.cloudsim.core.Datacenter;
9  import org.cloudsim.core.DatacenterConfig;
10 import org.cloudsim.core.DatacenterFactory;
11 import org.cloudsim.core.DatacenterHost;
12 import org.cloudsim.core.DatacenterNetwork;
13 import org.cloudsim.core.DatacenterPower;
14 import org.cloudsim.core.DatacenterResource;
15 import org.cloudsim.core.DatacenterStorage;
16 import org.cloudsim.core.DatacenterVM;
17 import org.cloudsim.core.DatacenterVMConfig;
18 import org.cloudsim.core.DatacenterVMFactory;
19 import org.cloudsim.core.DatacenterVMHost;
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161 import org.cloudsim.core.DatacenterVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMVMStorage;
162 import org.cloudsim.core.DatacenterVMVMVMVMVMVMVMVM
```

- Learn how to install the Eclipse in the virtual machine.
- Learn how to install the Cloud-Sim and IDE in the virtual machines.
- Understand the concept of Virtualization.
- Learn how to simulate in Eclipse using the Cloud-Sim IDE.
- Learned to manage and allocate the system resources like RAM, CPU and Disk Space for Virtual Machines.



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