CLOUD COMPUTING PRACTICAL WORK

Objective:

- To develop web applications in cloud
- Designing, Implementing and managing the issues of Cloud Computing.

LIST OF EXPERIMENTS:

- 1. Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows.
- 2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
- 3. Find a procedure to transfer the files from one virtual machine to another virtual machine.
- 4. Install Google App Engine. Create hello world app and other simple web applications using python/java.
- 5. Install Hadoop single node cluster and run simple applications like wordcount.
- 6. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
- 7. Case-Study

Outcome:

On completion of this, the students will be able to:

- Configure various virtualization tools such as Virtual Box, VMware workstation.
- Design and deploy a web application in a PaaS environment.
- Learn how to simulate a cloud environment to implement new schedulers.
- Install and use a generic cloud environment that can be used as a private cloud.
- Manipulate large data sets in a parallel environment.

EX.No:1

Install Virtualbox/VMware Workstation with different

flavours of linux or windows OS on top of widndows

<u>Aim:</u>

To install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8 or 10.

Procedure:

Downloading and installing VMware

Step 1: Download VMware



Step 2: Install the VMware Application



Step 3: Click Next



Step 4: Accept and Click Next

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End-User License	e Agreement			
Please read the fo	ollowing license agreem	ent carefully.		٣
VMWARE END U	SER LICENSE AGREE	EMENT		<u>^</u>
PLEASE NOTE TH	AT THE TERMS OF T	HIS END USER	LICENSE AGREE	MENT
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Step 5: Click Next

	Setup	-
Custom Setup		
Select the installation desti	nation and any additional features.	
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C:\Program Files (x86)\VM	ware\VMware Workstation\	Change

Step 6: Click Next

VMware Workstation Pro Setur	p	- 0	.×
ser Experience Settings			
Edit default settings that can imp	prove your user experience.		۲
Join the VMware Customer Ex VMware's Customer E ("CEIP") provides VMW VMware to improve it problems, and to advi our products. As part o	xperience Improvement Progr xperience Improvement ware with information ts products and service se you on how best to of the CEIP, VMware co	am nt Program that enables s, to fix deploy and use bliects technical,	
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Step 7: Click Next



Step 8: Click Install

😽 VMware Workstation Pro S	etup		- 0	×
Ready to install VMware	Workstation Pro			Ø
Click Install to begin the insta installation settings. Click Ca	allation, Click Back to rev ncel to exit the wizard.	riew or change any	ofyour	
	17-		<u></u>	

Step 9: Installing

🛃 VMware \	Workstation Pro Setup		67 0		
Installing) VMware Workstati	on Pro		Ø	
Please wait	while the Setup Wizard in	nstalls VMware Works	tation Pro.		
Status:	Copying new files			24	
		Back	Next	Cancel	

Step 10: Click Finish

WORKSTATION PRO" 16	Completed the VMware Workstation Pro Setup Wizard
10	Click the Finish button to exit the Setup Wizard.
	Press the License button below if you want to enter a license. key now.
	License Finish

Downloading Ubuntu

Step 11: Download the Ubuntu OS



Step 12: Create new virtual machine

Nos hare to rearch	☆ Home ×	
I My Computer		Your evaluation period ends in 25 days. 1. Get a license key 2. Enter a license key
		WORKSTATION 16 PRO"
		$\bigoplus_{\text{Create a New}} \boxed{\overrightarrow{Cper a Virtual}} \xrightarrow{\overrightarrow{Conrect to a}}$
		Virtual Mathine Mathine Remote Server
	VIIIware	
	-4	

Step 13: Click Next

WORKSTATION PRO 16	Welcome to the New Vi Machine Wizard	rtual RO ^{**}
16		
	What type of configuration do you want	\rightarrow
	O Typical (recommencec)	Connect to .
	D'eate a Widnestation 16.x virtual n In a few casy steps	rachine Remote Serve
	(advanced)	
	Credic a vintuel machine with Jatva nglicins, such as a SCSIty.infinitien virtual disk type and compatibility, w ober-VMware products.	niced yur. ith
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Step 14: Browse the downloaded Ubuntu file and click next

New Virtual Machine Wizard	×	
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		Connect to
Installer decimage file (30)?		Remote Serv
D:\Download\ubuntu-20.04.1-desktop-and64.iso ~	BLOWSE	
Ubuntu 64-bit 20.04.1 detected. This operating system will use Easy Install. (What's this?)	а — н. (С	
O1 will install the operating system later.		
The virtual machine will be created with a blank hard disk.		
	-	

Step 15: Create an username and password and click next

New Virtu	Inaction period ends in 25 days.	X	2. Lnter a lic
Personaliza		RO	
<u>Ful</u> name	leavaRamanatran	\rightarrow	
Lacribar	r: jzeva201225		
Bactwor		Connect t	to a
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e open virtual machines

Your evaluation period ends in 25 days	icense kov 2. Enter a license k
New Virtual Machine Wrant > Kanne the Virtual Machine What raine would you like to use for U file virtual machine?	RO"
Yrual machine neme: [Thunt i fot net	\rightarrow
Location: Call Brenk, PEVA RAMANA (HAN) and ments (Antio) Mindmenh, Im The default location can be changed as Bit is Preferences.	Connect to a Rémote Server
	r.

Step 16: Choose the location to use your virtual machine and click next



New Virtual Machine Wizard	<
Select a Disk Which disc do you want to use?	RO*
Diek ©Crease a new yintual disc	\rightarrow
A virtue disk is composed of one or more files on the raset file system, which will appear as a single hand disk to the guest operating system. Virtual disks can easily be capied or moved on the same host or between hosts.	Connect to a
Ouse an existing virtual disk Choose this option to reuse a previously configured disk.	Remote Server
Use a ghysical disk (for advanced users) Choose this option to give the virtual mechine direct access to a local hard disk. Requires administrator privileges.	
Hap > gadk Next > Cancel	

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Step 18: Specify the disk size and click next

(1) Your evaluation period ends in 25 days.	. Get a license key	2. Enter a
New Virtual Machine Wizard	×	
Specify Disk Capacity How large do you want this disk to be?	RO™	
Mensimum tlick 5 er (GB): 15 -		
Recommended size for Ubuntu 64-bit: 20 GB	-	
Allocate all disk space now.		
Should not the full aparity can enhance performance but requires all chysical disk space to be available right now. If you do not allocate a now, the virtual disk starts small and grows as you add data to it.	of the space Remote Se	o a rver
Store virtual cisk as a single file		<u>, (</u>
Solit virtual dak into multiple files		
Splitting the sisk makes it easier to move the virtua machine to anot out may reduce performence with very large sista.	her computer	
Lielo Seck Next >	Cance	

Step 19: Click Next

(!)	our evaluation period ends in 25	days.	1. Get a liœnse key	2. Enter a
U	New Virtual Machine Wizard Specify Disk File Where would you like to store the disk file?		× RO™	
	Disk file A 15 GB virtual disk be created using multiple dsl automatically named based on this file name.	k files. The disk file	s will be	<u>}</u>
			Remote :	Server
 8	Help Sack	<u>Next ></u>	Carcel	

Step 20: Click Finish

(!) Your evaluation period ends in 25 days. 1. Get a license key
New Virtual Machine Wizard Ready to Create Virtual Machine Click Finish to create the virtual machine and start installing Ubuntu 64-bit RO ⁷⁹
The virtual machine will be created with the following settings:
Name: Ubuntu 64-bit * Location: C:\Uery1VEEVA RAMANATHAN\Documents\Virtual M * Version: Workstation 16.x * Operating System: Ubuntu 64-bit * Hard Disk: 15 GB, Split * Memory: 2098/MB * Network Adapter: NAT *
Quistomize Hardware ☑ Power on this virtual machine after creation



Step 21: Installing Ubuntu on VMware and unzipping files





Step 22: Login to Ubuntu



Step 23: Skip everything

Horre 🗙 🕞 Ubuntu 64-bit 🛛		
ctivities 🛛 🧐 Welcome to Ubuntu 👻	Nov 7 03:23	ቶ 🐠 😃
<u> </u>	Online Accounts	Skip
	Connect Your Online Accounts Connect your accounts to easily access your online calendar, documents, photos and more.	
0	Ubuntu Single Sign-On	
	• Nextcloud	
2		
3		
	Accounts can be added and removed at any time from the Settings application.	

Step 24: Click Done



Step 25: Thus we have installed VMware Workstation with different flavours of linux on top of windows



<u>Result</u>: Thus, VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8 or 10.has been successfully installed and executed.

EX.No:2

Install a C compiler in the virtual machine created using

virtual box and execute a simple program

Aim:

To install a C Compiler in the virtual machine created using virtual box and executes a simple C program.

Procedure:

Step 1: Open the terminal on Ubuntu and install C compiler - "sudo apt install gcc"



Step 2: Once the installation finished open the editor

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Step 3: Type a simple C program on editor and save it



Step 4: Compile and run the C program

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Result:

Thus a C compiler is installed in the virtual machine and C program was executed and output was obtained successfully.

EX.No:3 Transfer files from one host machine to another virtual machine

Aim:

To transfer files/folders from the host machine to the virtual machine.

Procedure:

Files that are to be shared to virtual machine

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Libraries Network											

Step 1: Open the ubuntu in VM





Step 2: Open the file manager and go to Other Locations

Step 3: Open the folder named "mnt"







Initially the folder will be empty

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Step 5: Now right click ubuntu 64-bit(VM name) and select properties, then go to options tab

Libentu 64-bit - VMivare Workstation	Virtual Machine Settings	×	- 0 ×
File Foil View VIV Telss Help	Hat water Options		
Lbray × A Type hard to search → Activities My Lomputer Ubuncu 66 br: () () () () () () () () () ()	Setting: Summery Defined: Joints (4-b) Proter: Joints (4-b) Proter: Josef of Joints (3-sevel) (3-sevel) Constraints Definition: Josef Definition: Josef Defi	Vétal incohine neme Usuntu se-be G as in grav-Bing spèlen Masset Madoue Elicus Vitane ES Other Warkin de-be Werkin directory Usipleunt: Dispendiane graphon files will be stored here. Ennoncid ke roard Dit	
		OK Carcel Hep -	

Step 6:Select the shared folders, change the radio button to "Always enabled" and click Add



Step 7: Click Next



Step 8.Select the folder/file that has to be shared to VM in Host Path

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Image: Specified reaction Image: Specified reaction <td></td>	

Step 9: Check Read Only and click Finish

File Edit View VM Tabs Help 📗 - :	Hardware Options				
Library × Athene Computer	Settings Genera Prover Shared Folders Snapshots AutoProject	Surmary Uburtu 64-sit Disabled	Folder sharing	es to programs in the Your computer and snared folders IF you Your data.	
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		< 8.	ick Finich Cancel		

Step 10: Now in the same location "Computer>mnt>hgfs" the folder that are shared from hostis visible



Step 11:

Step 12: The files can be accessed in Read Only Mode in the VM now

Result:

Thus file sharing between is done between host machine and the virtual machine successfully.

Aim:

To install the google app engine in the system.

Procedure:

Step 1: Open the following link - <u>https://cloud.google.com/appengine/downloads</u> and clickpython.

Step 2: Select setting up your environment development and click on install the and initialize the cloud sdk.

Step 3: Download the sdk installer and install it.

Step 4: Click Next.

Step 5: Click I Agree.

Google Cloud SDK Setup		<u>6</u> 23	
🚫 Goog	le Cloud Pl	atform	
in the second			
Press Page Down to see the rest of thi	e-agreement.		
License v. 2.0 (the "License"), unless license file.	otherwise specified by a	n alternate	Â
You may obtain a copy of the License	at		
http://www.auache.org/licenses/bt	CENSE-2.0		and a second
Note that if you use the Cloud SDK wi your use is additionally going to be go terms of service, as applicable, of the	th any Googe Cloud Pla verned by the license a underlying Googe Clou	tto m procucts, creement or d Platform,	
If you accept the terms of the agreem agreement to install Gocyle Cloud SDK	ent, didk I Agree to cor	finue. You must ar	cept the
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5 478 - 1	1		

Step 6: Select single user and click Next.

Step 7: Select the destination location and click Next.

Setup will install Google Cloud SDK in th Browse and select another folder. Click	e following folder. To install in a different folder, dick Next to continue.
Destination Polder	Nava Vocal/Scogle (Cloud SDK) Browsc
Space required: 89.0MB Space available: 5.0GB	
	< Back Next > Cancel

Step 8: Downloading all the requirements and installing

Condie Cibra 35K Setup			
🚫 Goo	gle Cloud P	latform	
Downloading Google Cloud SDK con			
Show details			

Step 9: Click Finish.

Step 10: Once successfully installed cmd line in login with your google account.

Result:

Thus google app engine is installed successfully in the system.

EX.No:5 Install Hadoop single mode cluster and run simple applications

Aim:

To install hadoop single mode cluster and run a simple word count application.

Procedure:

Update the packages

Installing java

Assigning a dedicated user on hadoop to perform operations

「〒 jeeva201028@ubuntu:~ Q ☰ _ □ ⊗	
<pre>J+1 Jeeva201028@ubuntu:~ Q = - 0 OpenJDK Runtime Environment (build 11.0.9+11-Ubuntu-Oubuntu1.20.04) OpenJDK 64-Bit Server VM (build 11.0.9+11-Ubuntu-Oubuntu1.20.04, mixed mode, sha ring) jeeva201028@ubuntu:-\$ sudo addgroup hadoop [sudo] password for jeeva201028: Adding group `hadoop' (GID 1001) Done. jeeva201028@ubuntu:-\$ sudo adduseringroup hadoop jeeva Adding user `jeeva' Adding new user `jeeva' (1001) with group `hadoop' Creating home directory `/home/jeeva' Copying files from `/etc/skel' New password: Retype new password: passwd: password updated successfully Changing the user information for jeeva</pre>	
Enter the new value, or press ENTER for the default Full Name []: Jeeva	
Room Number []: 1 Work Phone []: 98765	
Home Phone []: 43210 Other []:	
Is the information correct? [Y/n] Y jeeva201028@ubuntu:~\$	

Adding user to sudo list

Next install a package ssh(secured shell login)

	@ubuntu: ~	Q			
<pre>jeeva201028@ubuntu:~\$ sudo adduser jeeva s [sudo] password for jeeva201028: Adding user `jeeva' to group `sudo' Adding user jeeva to group sudo Done. jeeva201028@ubuntu:~\$ sudo apt-get instal Reading package lists Done Building dependency tree Reading state information Done The following additional packages will be ncurses-term openssh-sftp-server ssh-im Suggested packages: molly-guard monkeysphere ssh-askpass The following NEW packages will be instal ncurses-term openssh-server openssh-sft 0 upgraded, 4 newly installed, 0 to remove Need to get 688 kB of archives. After this operation, 6,010 kB of addition Do you want to continue? [Y/n]</pre>	sudo l openssh-server installed: port-id led: p-server ssh-impor e and 237 not upgr nal disk space wil	t-id aded l be	used		

Next step is key generation and add a key to the file

F	jeeva@ubuntu: ~	Q =		8
<pre>jeeva@ubuntu:~\$ pwd /home/jeeva jeeva@ubuntu:~\$ ssh- Generating public/pr Enter file in which Created directory '/ Your identification Your public key has The key fingerprint SHA256:kdjFKbAxpSwyY The key's randomart +[RSA 3072]+ 0+0 . 0=. B.00 =0.0=.+. . ++. 0.0 . + . S+ 0 00 ++++ + E +*00.0 . ===0 +[SHA256]++ jeeva@ubuntu:~\$</pre>	keygen -t rsa -P " " ivate rsa key pair. to save the key (/home/jeeva/.ssh/id home/jeeva/.ssh'. has been saved in /home/jeeva/.ssh/i been saved in /home/jeeva/.ssh/id_rs is: 'ZTHae7PiBjotPzG+CK741F5xPc9yDs jeeva image is:	_rsa): d_rsa a.pub @ubuntu		

To check whether ssh is installed properly by logging in and after that exit from it

Download Hadoop using this link : https://downloads.apache.org/hadoop/common/

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	hadoop-2.7.7/	2020-07-03-04:39	828		I
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	hadoop 2.9.2/	2020 07 03 04:38			I
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	hadoop-3.1.4/	2020-11-05 18:27	85%		I
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	hadoop-3.3.0/	2020-11-05 18:29			I
	<u>stable/</u>	2020-07-03-04:38			I
	stable2/	2020-07-03 04:38			I
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Download the hadoop-2.9.2.tar.gz file

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2					
h	https://downloads.apache.org/had	loop/common/hado	op-2.9.2/hadoop-2.9.2 tar.gz		

Now extract the tar file

Move the file to local and Change the ownership of hadoop folder

ন jeeva201028@ubu	itu: ~/Downloads	Q	Ξ		8
Jeeva201028@ubun hadoop-2.9.2/share/doc/hadoop/hadoop-kms/css/site.css hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/csternal.p hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/csternal.p hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/com_info_ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/ hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/mave hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/buil hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logos/buil hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/logo_apach hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/icon_error hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/icon_error hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/icon_error hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/apache-mav hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/maven-logo hadoop-2.9.2/share/doc/hadoop/hadoop-kms/images/icon_succe hadoop-2.9.2/share/do	ng ml.gif ong s.jpg d-feather.png d-by-maven-white.png d-by-maven-black.png tf e.jpg ng_sml.gif .jpg sml.gif en-project-2.png -2.gif ss_sml.gif	Q			8
<pre>hadoop-2.9.2/share/doc/hadoop/hadoop-kms/dependency-analys jeeva201028@ubuntu:~/Downloads\$ sudo mv hadoop-2.9.2 /usr jeeva201028@ubuntu:~/Downloads\$ sudo chown -R jeeva /usr/l</pre>	is.html /local/Hadoop ocal				1
jeeva201028@ubuntu:~/DownLoads\$					

In .bashrc file add the following and make it at source

F	jeev	a201028@ubuntu: ~	/Downloads		Q =	- 0	\otimes
GNU nano 4.8	/	home/jeeva201028	3/.bashrc			Modifi	ed 🚺
. ~/.bash_alia fi	ses						
<pre># enable programma # this, if it's al # sources /etc/bas if ! shopt -oq pos if [-f /usr/share/b elif [-f /usr/share/b elif [-f /etc/b . /etc/bash_co fi fi export JAVA_HOME=/ export PATH=\$PATH: export PATH=\$PATH: export HAD00P_HOPE export HAD00P_MORP export HAD00P_MORE=? export YARN_HOME=? export YARN_MORE=? export YARN_MORE=?</pre>	<pre>ile completion features (you d ready enabled in /etc/bash.bas h.bashrc). .x; then re/bash-completion/bash_completion ash_completion]; then npletion usr/lib/jvm/java-8-openjdk-amd e/usr/local/hadoop MADOOP_MOME/bin MADOOP_MOME/bin MADOOP_MOME/bin BADOOP_MOME/Sbin ED_HOME=SHADOOP_MOME HOME=SHADOOP_MOME HOME=SHADOOP_MOME HOME=SHADOOP_MOME HOME=SHADOOP_MOME HOME=SHADOOP_MOME HOME=SHADOOP_MOME</pre>	on't need to ena hrc and /etc/pro tion]; then 64					
export HADOOP_OPTS	-"-Djava.library.path=\$HADOOP_	HOME/lib"					
<mark>^G</mark> Get Help ^O ∧X Exit ^R	Write Out [∧] ₩ Where Is Read File <mark>^\</mark> Replace	<mark>^K</mark> Cut Text <u>^U</u> Paste Text	<mark>^]</mark> Justify <mark>^T</mark> To Spell	AC Cur Pos A Go To Line	M-U Undo M-E Redo		

jeeva201028@ubuntu: ~/Downloads Q	= -	8
<pre>hadoop-2.9.2/share/doc/hadoop/kms/images/collapsed.gif hadoop-2.9.2/share/doc/hadoop/kms/images/bg.jpg hadoop-2.9.2/share/doc/hadoop/kms/dependency-analysis.html jeeva201028@ubuntu:~/Downloads\$ sudo mv hadoop-2.9.2 /usr/local/Hadoop jeeva201028@ubuntu:~/Downloads\$ sudo nano ~/.bashrc jeeva201028@ubuntu:~/Downloads\$ sudo nano ~/.bashrc jeeva201028@ubuntu:~/Downloads\$ source ~/.bashrc declare -x CUUTER_IM_MODULE="ibus" declare -x COLORTERM="truecolor" declare -x DBUS_SESSION_BUS_ADDRESS="unix:path=/run/user/1000/bus" declare -x DESKTOP_SESSION="ubuntu" declare -x ODSESSION="ubuntu" declare -x GJS_DEBUG_OUTPUT="stderr" declare -x GJS_DEBUG_OUTPUT="stderr" declare -x GNOME_DESKTOP_SESSION_ID="this-is-deprecated" declare -x GNOME_SHELL_SESSION_ID="ubuntu" declare -x GNOME_TERMINAL_SCREEN="/org/gnome/Terminal/screen/c98c3178_c4bb_40a4_9647_3c0ea63ea95a" declare -x GROME_TERMINAL_SCREEN="/org/gnupg/S.gpg-agent:0:1" declare -x GROME_TERMINAL_SERVICE=":1.128" declare -x GROME_TERMINALSERVICE=":1.128" declare -x GROM</pre>		
declare -x GTK_MODULES="gail:atk-bridge" declare -x HANDOR_COMMON_HOWE="(usc(local/badoop"		
declare -x HADOOP_HDFS_HOME="/usr/local/hadoop"		
declare -x HADOOP_HOME="/usr/local/hadoop" declare -x HADOOP_MAPRED_HOME="/usr/local/hadoop"		
declare -x HOME="/home/jeeva201028" declare -x IM_CONFIG_PHASE="1"		I

Edit the hadoop-env.sh file as following

	.∫∓Ì		jeeva201028@	ubuntu: /usr/l	ocal/Hadoop/et	c/hadoop	Q		 25		(
-	GNU	nano 4.8	der the lic	had	oop-env.sh						
#	Set	Hadoop-spe	cific envir	ronment vari	ables here.						
* * * *	t The opt set rem	only requi ional. Whe JAVA_HOME ote nodes.	red enviror n running a in this fil	nment variab a distribute le, so that	le is JAVA_H d configurat it is correc	OME. All ion it is tly defir	l othe s best ned or	ers an t to n			
ŧ	t The	java imple	mentation t	to use.							
ŧ	texpo	rt JAVA_HOM	IE=\${JAVA_HC	DME}							
	хрог	t JAVA_HOME	=/usr/lib/j	jvm/java-11-	openjdk-amd6	4					
* * * * *	the tha pro dat	jsvc imple t bind to p tocol. Jsv a transfer rt JSVC HOM	mentation t privileged p c is not re protocol us HE=\${JSVC HO	to use. Jsvc ports to pro equired if S sing non-pri DME}	is required vide authent ASL is confi vileged port	to run s ication o gured for s.	secure of dat auth	e data ta tra nentio	anode ansfe catio	s r on of	
	G Ge X Ex	<mark>[line</mark> t Help ^0 it ^R	28/121 (23) Write Out / Read File /	6), col 52/5 WW Where Is NN Replace	2 (100%), ch ^K Cut Text ^U Paste Te	ar 1175/9 ^J Just xt <mark>^T</mark> To S	5024 (tify Spell	(23%) ^C (^ (] Cur P Go To	os Lin	e

Edit the core-site.xml

Edit the hdfs-site.xml

Edit the yarn-site.xml

Edit the mapred-site.xml by remaning the mapred-site.xml.template

Fl	jeeva201028@ubuntu: /usr/local/Hadoop/etc/hadoop	Q				8
eeva20102	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
eeva20102	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
eeva2010	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
eeva20101	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
eeva20102	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
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eeva20101	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
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eeva2010	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$					
eeva2010	28@ubuntu:/usr/local/Hadoop/etc/hadoopS					
eeva20102	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$ sudo nano	map	ored-s	ite.x	ml	
eeva20102	28@ubuntu:/usr/local/Hadoop/etc/hadoop\$ sudo cp ma	aprec	I-site	.xml.	temp	lat
mapred-	site.xml					
eeva20102	280ubuntu:/usr/local/Hadoon/etc/hadoonS					

Create the following directory

F	jeeva201028@ubuntu: ~/Desktop Q =	= 🚫
jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul	buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$	
jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul e mapred-site jeeva201028@ul	buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ buntu:/usr/local/Hadoop/etc/hadoop\$ sudo nano mapred-site.xm buntu:/usr/local/Hadoop/etc/hadoop\$ sudo cp mapred-site.xml.t .xml buntu:/usr/local/Hadoop/etc/hadoop\$ sudo nano mapred-site.xm	l emplat l
jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul jeeva201028@ul	buntu:/usr/local/Hadoop/etc/hadoop\$ cd buntu:~\$ cd Desktop/ buntu:~/Desktop\$ sudo mkdir -p /usr/local/hadoop_tmp buntu:~/Desktop\$ sudo mkdir -p /usr/local/hadoop_tmp/hdfs/nam buntu:~/Desktop\$ sudo mkdir -p /usr/local/hadoop_tmp/hdfs/dat buntu:~/Desktop\$ sudo chown -R jeeva /usr/local/hadoop_tmp buntu:~/Desktop\$	enode anode

Format hdfs namenode

	jeeva201028@ubuntu: ~	Q			8
eva201028@ubuntu:~S	hdfs				
age: hdfs [config	confdir] [loglevel loglevel] COMMAND				
where COMMAND	is one of:				
dfs	run a filesystem command on the file systems s	upported	in Ha	doop.	
classpath	prints the classpath				
namenode -format	format the DFS filesystem				
secondarynamenode	run the DFS secondary namenode				
namenode	run the DFS namenode				
journalnode	run the DFS journalnode				
zkfc	run the ZK Failover Controller daemon				
datanode	run a DFS datanode				
debug	run a Debug Adnin to execute HDFS debug comman	ds			
dfsadnin	run a DFS admin client				
dfsrouter	run the DFS router				
dfsrouteradmin	manage Router-based federation				
haadmin	run a DFS HA admin client				
fsck	run a DFS filesystem checking utility				
balancer	run a cluster balancing utility				
jmxget	get JMX exported values from NameNode or DataN	ode.			
mover	run a utility to move block replicas across				
	storage types				
oiv	apply the offline fsimage viewer to an fsimage				
oiv_legacy	apply the offline fsimage viewer to an legacy	fsimage			
oev	apply the offline edits viewer to an edits file	e			
Fetchdt	fetch a delegation token from the NameNode				
getconf	get config values from configuration				

	jeeva201028@ubuntu: ~				×
balancer	run a cluster balancing utility				
imxact	get JMX exported values from Name	Node or Data	Node		
mover	run a utility to move block repli	cas across			
	storage types				
oiv	apply the offline fsimage viewer	to an fsimag	je		
oiv_legacy	apply the offline fsimage viewer	to an legacy	/ fsi	mage	
oev	apply the offline edits viewer to	an edits fi	lle		
fetchdt	fetch a delegation token from the	NameNode			
getconf	get config values from configurat	ion			
groups	get the groups which users belong	to			
snapshotDiff	diff two snapshots of a directory	or diff the	2		
	current directory contents with a	snapshot			
lssnapshottableDir	list all snapshottable dirs owned	by the curr	ent	user	
	Use -hel	p to see opt	tions		
portmap	run a portmap service				
nfs3	run an NFS version 3 gateway				
cacheadmin	configure the HDFS cache				
crypto	configure HDFS encryption zones				
storagepolicies	list/get/set block storage polici	es			
	print the version				

jeeva201028@ubuntu: ~

Q≡

\$ start-dfs.sh

\$ start-yarn.sh

To check whether hadoop is correctly installed or not: \$ jps

jeeva201028@ubuntu: ~ doop tmp/hdfs/namenode/current/fsimage.ckpt 000000000000000000 of size 330 byt es saved in 0 seconds . 20/11/08 12:04:47 INFO namenode.NNStorageRetentionManager: Going to retain 1 im ages with txid >= 0 20/11/08 12:04:47 INFO namenode.NameNode: SHUTDOWN_MSG: ****** SHUTDOWN_MSG: Shutting down NameNode at ubuntu/127.0.1.1 jeeva201028@ubuntu:/usr/local/hadoop\$ cd jeeva201028@ubuntu:~\$ start-dfs.sh WARNING: An illegal reflective access operation has occurred WARNING: Illegal reflective access by org.apache.hadoop.security.authentication .util.KerberosUtil (file:/usr/local/hadoop/share/hadoop/common/lib/hadoop-auth-2.9.2.jar) to method sun.security.krb5.Config.getInstance() WARNING: Please consider reporting this to the maintainers of org.apache.hadoop .security.authentication.util.KerberosUtil WARNING: Use --illegal-access=warn to enable warnings of further illegal reflec tive access operations WARNING: All illegal access operations will be denied in a future release 20/11/08 12:06:10 WARN util.NativeCodeLoader: Unable to load native-hadoop libr arý for your platform... using builtin-java classes where applicable Starting namenodes on [localhost] jeeva201028@localhost's password:

jeeva201028@ubuntu:~QI-DI028-datanode-ubuntu.outStarting secondary namenodes [0.0.0.0]jeeva201028@0.0.0.0's password:0.0.0.0: secondarynamenode running as process 20058. Stop it first.WARNING: An illegal reflective access operation has occurredWARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/usr/local/hadoop/share/hadoop/common/lib/hadoop-auth-2.9.2.jar) to method sun.security.krb5.Config.getInstance()WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtilWARNING: Useillegal-access=warn to enable warnings of further illegal reflective access operationsWARNING: All illegal access operations will be denied in a future release20/11/08 12:09:32 WARN util.NativeCodeLoader: Unable to Load native-hadoop library for your platform using builtin-java classes where applicablejeeva201028@ubuntu:\$ start-yarn.shstarting resourcemanager, logging to /usr/local/hadoop/logs/yarn-jeeva201028-resourcemanager-ubuntu.outjeeva201028@localhost's password:localhost: starting nodemanager, logging to /usr/local/hadoop/logs/yarn-jeeva201028.lo28-nodemanager-ubuntu.outjeeva201028@ubuntu:~\$						
028-datanode-ubuntu.out Starting secondary namenodes [0.0.0.0] jeeva201028@0.0.0.0's password: 0.0.0.0: secondarynamenode running as process 20058. Stop it first. WARNING: An illegal reflective access operation has occurred WARNING: Illegal reflective access by org.apache.hadoop.security.authentication .util.KerberosUtil (file:/usr/local/hadoop/share/hadoop/common/lib/hadoop-auth- 2.9.2.jar) to method sun.security.krb5.Config.getInstance() WARNING: Please consider reporting this to the maintainers of org.apache.hadoop .security.authentication.util.KerberosUtil WARNING: Useillegal-access=warn to enable warnings of further illegal reflec tive access operations WARNING: All illegal access operations will be denied in a future release 20/11/08 12:09:32 WARN util.NativeCodeLoader: Unable to load native-hadoop libr ary for your platform using builtin-java classes where applicable jeeva201028@ubuntu:-\$ start-yarn.sh starting yarn daemons starting resourcemanager, logging to /usr/local/hadoop/logs/yarn-jeeva201028-re sourcemanager-ubuntu.out jeeva201028@localhost's password: localhost: starting nodemanager, logging to /usr/local/hadoop/logs/yarn-jeeva20 1028-nodemanager-ubuntu.out jeeva201028@ubuntu:-\$	jeeva201028@ubuntu: ~	Q				8
	028-datanode-ubuntu.out Starting secondary namenodes [0.0.0.0] jeeva201028@0.0.0.0's password: 0.0.0.0: secondarynamenode running as process 20058. Sto WARNING: An illegal reflective access operation has occu WARNING: Illegal reflective access operation has occu WARNING: Illegal reflective access by org.apache.hadoop, .util.KerberosUtil (file:/usr/local/hadoop/share/hadoop, 2.9.2.jar) to method sun.security.krb5.Config.getInstand WARNING: Please consider reporting this to the maintaind .security.authentication.util.KerberosUtil WARNING: Useillegal-access=warn to enable warnings of tive access operations WARNING: All illegal access operations will be denied in 20/11/08 12:09:32 WARN util.NativeCodeLoader: Unable to ary for your platform using builtin-java classes when jeeva201028@ubuntu:~\$ start-yarn.sh starting resourcemanager, logging to /usr/local/hadoop/ sourcemanager-ubuntu.out jeeva201028@localhost's password: localhost: starting nodemanager, logging to /usr/local/h 1028-nodemanager-ubuntu.out	op it f urred .securi /common ce() ers of o f furth n a fut load n re appl logs/ya hadoop/	irst. ty.au /lib/ org.a er il ure r ative icabl rn-je	ithen hado ppach lega e-had e eva2 'yarn	tica op-a e.ha l re se oop 01020 -jee	tion uth- doop flec libr 8-re va20

To execute word count program:

Create a directory and add a text file in it named "sample.txt"

jeeva201028@ubuntu: ~/Desktop/data1 Q ≡ _ □ 😵
^Cjeeva201028@ubuntu:~\$ jeeva201028@ubuntu:~\$ jeeva201028@ubuntu:~\$
jeeva201028@ubuntu:~\$ jeeva201028@ubuntu:~\$ jeeva201028@ubuntu:~\$ jeeva201028@ubuntu:~\$
jeeva201028@ubuntu:~\$ jps 20898 NodeManager 19363 NameNode 20756 ResourceManager
21146 Jps 20058 SecondaryNameNode jeeva201028@ubuntu:-\$
jeeva201028@ubuntu:~\$ Cd /nome/jeeva201028/Desktop/ jeeva201028@ubuntu:~/Desktop\$ mkdir data1 jeeva201028@ubuntu:~/Desktop\$ cd data1 jeeva201028@ubuntu:~/Desktop/data1\$ sudo nano sample.txt jeeva201028@ubuntu:~/Desktop/data1\$

Input: 'sample.txt" file

hello how are you communcication components computational computer coordinate coordinate compiler distributed file sy hadoop single node cluster word count	/stem -			
^G Get Help ∧O k	Write Out 🖓 Where I	s ^K Cut Text ^∃ Just	tfy [∧] C Cur Pos M−U Undo	M-A Mark Text M-1 To Bracket

Now run bin/hdfs dfs -mkdir /user

Then run bin/hdfs dfs -mkdir /ypm

Run the program //word count prgm will be in the jar file by default which we are using now.

\$ bin/hadoop jar share/hadoop/mapreduce/hadoop-mapreduce-examples-2.9.2.jar wordcount /user/input output

Now run the following command to see the output

\$ bin/hdfs dfs -cat output/*

deeva2010280ubuntu:/usc/local/badoonS	
leevaplo280ubintu://sc//bcal/badoopS	
deva2010283uburtu:/usr/local/hadoop\$	
jeeva201028gubuntu:/usr/local/hadoop\$	
jeeva201028gubuntu:/usr/local/hadoop\$ bin/hdfs dfs -cat output/*	
WARNING: An illegal reflective access operation has occurred	
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/usr/local/hadoop/share/hadoop/comm	0
n/lib/hadoop-auth-2.9.2.jar) to method sun.security.krb5.Config.getInstance()	
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil	
WARNING: Useillegal-access⇔warm to enable warnings of further illegal reflective access operations	
WARNING: All illegal access operations will be denied in a future release	
20/11/07 17:25:31 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform using builtin-java classes where ap	р
licable	
are 1	
cluster 1	
communcication 1	
compiler 1	
components 1	
computational 1	
computer 2	
computing 1	
coordinate 1	
count 1	
distributed 1	
file 1	
hadoop 3	
hello 1	
how 1	
Single 1	
system 1	
	1
you i	

Using gui: In browser open port 50700, http://localhost/50070 (Hadoop must be running)

☆

Overview 'localhost:9000' (active)

DFS Remaining:

-

Staned:	Sat Nov 07 15:45:51 +0530 2020	
Version:	2.9.2, r826afbeae31ca687bc2f8471dc841b66ed2c6704	
Compiled:	Tue Nov 13 18:12:00 +0530 2018 by ajisaka from branch-	2.9.2
Cluster ID:	CID-412455a2-d8d7-4Cba-898b-e279108927ct	
Block Pool ID:	BP-434539900-127.0.1.1-1604743359075	
Security is off.		
Security is off.		
Security is off. Safemode is off. 20 files and directories, 5 bl-	ocks = 25 total filesystem object(s).	
Security is off. Safemode is off. 20 files and directories, 5 bit Heap Memory used 73.32 M	ocks = 25 total filesystem object(s). 48 of 113 MB Heap Memory, Max Heap Memory is 1000 MB	
Security is off. Satemode is off. 20 files and directories, 5 bli Heap Memory used 73 32 N Non Heap Memory used 50	ooks = 25 total filesystem object(s). 48 of 111 MB Heap Memory, Max Heap Memory is 1000 MB 157 MB of 54.81 MB Committed Non Heap Memory. Max Non Heap Mem	nory is «unbounded».
Security is off. Safemode is off. 20 files and directories, 5 bit Heap Memory used 73.32 M Von Heap Memory used 50 Configured Capacity :	ocks = 25 total filesystem object(s). 48 of 111 MB Heap Memory, Max Heap Memory is 1000 MB 177 MB of 54.81 MB Committed Non Heap Memory, Max Non Heap Mem	nory is «untbounded». 97.63 GB
Security is off. Safemode is off. 20 files and directories, 5 bi Heap Memory used 73.32 h Aon Heap Memory used 50 Configured Capacity: DFS Used:	ocks = 25 total filesystem object(s). 48 of 111 MB Heap Memory. Mox Heap Memory is 1000 MB .57 MB of 54.81 MB Committed Non Heap Memory. Mox Non Heap Mem	nory is <unbounded>. 97.63 GB 296 <b (0%)<="" td=""></unbounded>

77.2 GB (79.07%)

Hadoop Overview Detenodes Datanode Velume Failues Snapsher Startup Progress Utilites -
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Datanode usage histogram
ຳ ວ່າ ເດັ່ງສໍ່ໜໍ່ ເພື່ອນ ເພື່ອນ ເພື່ອນ ເພື່ອນ Disk usage of each DataNoce (M) ກໍ່ ເພື່ອນ ເພື່ອນ ນັ້ວ ເດັ່ງ ເພື່ອນ ເພື
In operation
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Node II Http://ddress II Last bontact II Last Elock Report II Capacity II Blocks II Elock peol ased II Version I
✓ Jeenabolis (127.0.0.15.2010) http://res/ar50675 06 114m 57.0166 5 296.98 (0%) 2.92

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Browse Directory

how 25	✓ entries								Search:				
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۵	drws	ŝ.	eeva201028		supergroup	ОB	Nov 07 17:11	<u>0</u>	0 B		imp		â
۵	drww-xr-x	j.	eeva201028		supergroup	08	Nov 07 17:16	8	08		user		8
0	drwxr-xr-x		mua201/928		supergroup	υв	Nov 07 17:00	<u>B</u>	08		ypra		8
howing 1	to 3 of 3 entries										revisus		Next

	TRANSFE VALUES FOURS SERVICE SERVICES (1997)	
Browse Directory	File information - sample.txt Downoad Head the file (first 32(6) Tail the file (first 32(6))	*
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Strow as w entries	Block ID: 1073742825 Block Peol ID: 5P-433539600-137.0.1 1-1604743859075	Search:
D It Permission I/ Owner	Generation Stamp: 1001	Nock Size II Name II
🗆 -ovrr. kesh	Size: 186	28 MB serrolates 🕅
Showing 1 to 1 of 1 entries	Avealability: • keesscontein	Paristan 1 And
Hadeop. 2018.	File contents	
	Insta No amangini Computation	

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Browse Directory
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Result:

Thus the installation of hadoop single mode cluster and execution of word count program is done and the output is obtained successfully.

EX.No:6

Simulate a cloud scenario using CloudSim and run a

scheduling algorithm

Aim:

To simulate a cloud scenario using CloudSim and run a scheduling algorithm_that is not present in CloudSim.

Procedure:

Step 1: Download CloudSim installable files from: https://code.google.com/p/cloudsim/downloads/list and unzip the download.

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Step 3: Type the code and add the jar file to the libraries. The jar file will be in the extracted cloudsim.

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Step 4:Run the application

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OUTPUT:

Step 5: Again create a new project and name it as "Cloudsim2"

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Step 6:Type the code and include the jar file

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Step 7:Run the application

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Result:

Thus the simulation a cloud scenario using CloudSim and run a scheduling algorithmthat is not present in CloudSim is done and the output is obtained successfully.