Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Computer Science and Engineering

Assignment 1

Regulations – R2021

Degree & Branch	BE - CSE				**Semester**	6
Subject Code & Name	**UCS2621 – CLOUD COMPUTING**					
Academic Year	2024-2025 ~~ODD~~/EVEN	**Batch**	2022-2026			
Assignment 1	**Answer All Questions**				**Maximum: 40 Marks**	

(K1: Remembering, K2: Understanding, K3: Applying, K4: Analyzing, K5: Evaluating)

Course Outcomes

CO1:	Summarize about the basics of Cloud Computing (K2)
CO2:	Apply the concept of virtualization and analyze its types (K3)
CO3:	Solve various design challenges in cloud environment (K3)
CO4:	Develop and deploy services on cloud and be able to set up a private cloud environment using open-source software (K3)
CO5:	Outline the security challenges in cloud environment (K2)

Assignment -1 : Creation of Virtual Machine and Resource Management

Assigned Date: 03.03.2025 **Due Date: 21.03.2025**

I. Make use of the following steps and create a Virtual Machine (Hosted- Virtual Machine) [CO2, K3] [2.3.1, 13.2.1] (10 Marks)

1. Install Virtual Box in Host Operating System (amd- 64 bit processor architecture).
2. Check whether the processor supports virtualization or not by giving following command in terminal.

   Command to check if CPU supports Virtualization or Not.
   ]$ grep --color vmx /proc/cpuinfo
   ]$ cat /proc/cpuinfo| egrep "vmx|svm"
   ]$ grep –E 'svm|vmx' /proc/cpuinfo

   vmx – Intel VT-x, virtualization support enabled in BIOS.
   svm – AMD SVM,virtualization enabled in BIOS.

3. Create a Virtual Machine (VM) with 2GB RAM and 10 GB Hard Disk and install Ubuntu 16.04 Desktop as guest OS. Name the VM as VM1. [CO2, K3] [2.3.1, 13.2.1]
4. Switch the login into root user privilege mode by using the command.
   ]$ sudo -i

When asked for password, give your system password
give ***]$ ifconfig*** and check default IP address

5. Set up Network in Virtual Machine for connecting to internet.

   For **Wireless** internet connectivity, use **NAT** in the virtual machine's network settings.
   For **LAN** connection set **Bridged Adaptor**.

Network Confirguration in

sudo gedit /etc/network/interfaces

auto eth0

iface eth0 inet static

address 10.6.15. X

netmask 255.255.0.0

gateway 10.6.0.1

DNS server list 10.101.1.10

Network Confirguration in

sudo gedit /etc/resolv.conf

nameserver 10.101.1.10

Check Virtual IP in Terminal] $ **ifconfig**

and Check for Internet connection in terminal] $ **sudo apt-get update**

Set path variables in bashrc file

https://www.wikihow.com/Set-Up-Your-Java_Home-Path-in-Ubuntu

2. Consider a good resource provisioning technique should neither cause over provisioning nor cause under provisioning. However, the request model of demand could not be defined to a fixed pattern. A table with 5 time slots can represent the demand model. Let the duration of the timeslot be 2 minutes and the number of resources be 10. (CO3, K4) [2.2.2]

i. Simulate and inspect the demand request pattern as per the data mentioned in the following table. (CO3, K4) [2.3.1] (15 Marks)

ii. Develop a resource provisioning technique that allocates and releases resources in a proportional manner as per the incoming demand. Make use of the Discrete Event Simulation Model in Python Programming and implement the resource provisioning technique. (CO3, K3) [5.1.2, 13.2.1] (15 Marks)

Timeslots	**T1**	**T2**	**T3**	**T4**	**T5**
No. of Demands per time slot	100	400	200	300	50

Deploy the solution (ii) on top of the VM created in Question 1.
Implement (i) outside the VM.

Submission in LMS:

1. One page report on the process of creating VM, the resources in Host and VM.
2. Theoretical ideas of your demand request pattern.
3. Technical description on the developed resource provisioning technique.
4. Code and output screenshots for the 10-minute simulation.