

# **SKILL WORKBOOK**

22SDC105R - CLOUD DEVOPS

Team DevOps
K L UNIVERSITY | CLOUD DEVOPS



# **SKILL WORKBOOK**

STUDENT	
NAME	
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SECTION	
FACULTY	

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## Organization of the Student Lab Workbook

The laboratory framework includes a creative element but shifts the time-intensive aspects outside of the Two-Hour closed laboratory period. Within this structure, each laboratory includes two parts: Prelab and In-lab.

#### a. Pre-Lab

The Prelab exercise is a homework assignment that links the lecture with the laboratory period - typically takes 2 hours to complete. The goal is to synthesize the information they learn in lecture with material from their textbook to produce a working piece of software. Prelab Students attending a two-hour closed laboratory are expected to make a good-faith effort to complete the Prelab exercise before coming to the lab. Their work need not be perfect, but their effort must be real (roughly 80 percent correct).

#### b. In-Lab

The In-lab section takes place during the actual laboratory period. The First hour of the laboratory period can be used to resolve any problems the students might have experienced in completing the Prelab exercises. The intent is to give constructive feedback so that students leave the lab with working Prelab software - a significant accomplishment on their part. During the second hour, students complete the In-lab exercise to reinforce the concepts learned in the Prelab. Students leave the lab having received feedback on their Prelab and In-lab work.

# 2024-25 EVEN SEMESTER SKILL CONTINUOUS EVALUATION

Sl			Pre-Lab		In Lab		Post-Lab	Viva Voce	Total	Faculty
No	Date	Experiment Name	(10M)	Writeup (10)	Execution (10)	Results (5)	(10M)	(5M)	(50M)	Signature
1										
2										
3										
4										
5										
6										
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# 2024-25 EVEN SEMESTER SKILL CONTINUOUS EVALUATION

Sl			Pre-Lab	Viva Voce		In Lab		Post-Lab	Total	Faculty
No	I LISTA I HVNATIMANT NAMA	(10M)		Writeup (10)	Execution (10)	Results (15)	(10M)	(50M)	Signature	
9										
10										
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LAB 01: Use Git to deploy to GitHub with EC2 Ubun
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Date of the Session://	Time of the Session:	to
<ul> <li>Prerequisite:</li> <li>Software Engineering Methodologies.</li> <li>Python Programming.</li> <li>Basics of Web Development.</li> </ul>		
Pre-Lab Task:		
1) Define EC2?		
Ans:-		
2) Write a command to check Git in Ubuntu?		
Ans:-		
3) What are the advantages of Git?		
Ans:-		
4) What is AMI?		
Ans:-		

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## In Lab Task:

- 1) Deploy to GitHub via Git:
  - Install Git and set up your GitHub account
  - Execute the most popular commands in Git
  - Push all the files from local repository to GitHub.

# Post Lab Task:

• Write history of commands in Git bash to a file

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ate of the Session://	Time of the Session:to
rerequisite:	
• AWS Fundamentals	
• AWS CLI	
Pre-Lab Task:  1) What is Terraform, and how does it different Ansible, Chef, and Puppet?	Fer from other infrastructure-as-code (IaC) tools lil
Ans:-	
2) What are Terraform providers, and why provider in Terraform?	are they important? Can you give an example of
Ans:-	

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# In Lab Task:

- 1) Terraform Installation and working with terraform providers.
- 2) Deploy Your First Terraform Configuration on to AWS Cloud
- 3) Build and Test a Basic Terraform Module

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# **Post Lab Task:**

- a. Create a main.tf file where you will define your infrastructure resources:
- b. Create an EC2 instance that will act as your web server.
- c. Set up a security group allowing HTTP (port 80) traffic.

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# LAB 03 :Working with Input, Output Variables -Terraform( Modular Approach) Date of the Session: \_\_\_\_\_\_to\_\_\_\_\_

# **Prerequisite:**

- AWS Fundamentals
- AWS CLI

## **Pre-Lab Task:**

1) Explain Terraform Modules and its components? **Ans:**-

2) Explain the role of the main.tf, variables.tf, and outputs.tf files in a Terraform project Ans:-

R <b>In Lab Task:</b>
1) Using Terra

aform Provisioners to Set Up an Apache Web Server on AWS

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10,		Use		
	1)	USC	mp	'u

at and Output Variables to Query Data in AWS Using Terraform.

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Prerequisite:			
• AWS Fundamentals.			
• Web Development.			
<u>Pre-Lab Task:</u>			
1) What are the benefits of using Ans	ible roles to organize your cor	nfiguration tasks?	•
Ans:-			
2) Define How would you modify the p of Apache?	laybook to install a different we	b server, such as N	Nginx, instea
Ans:-			

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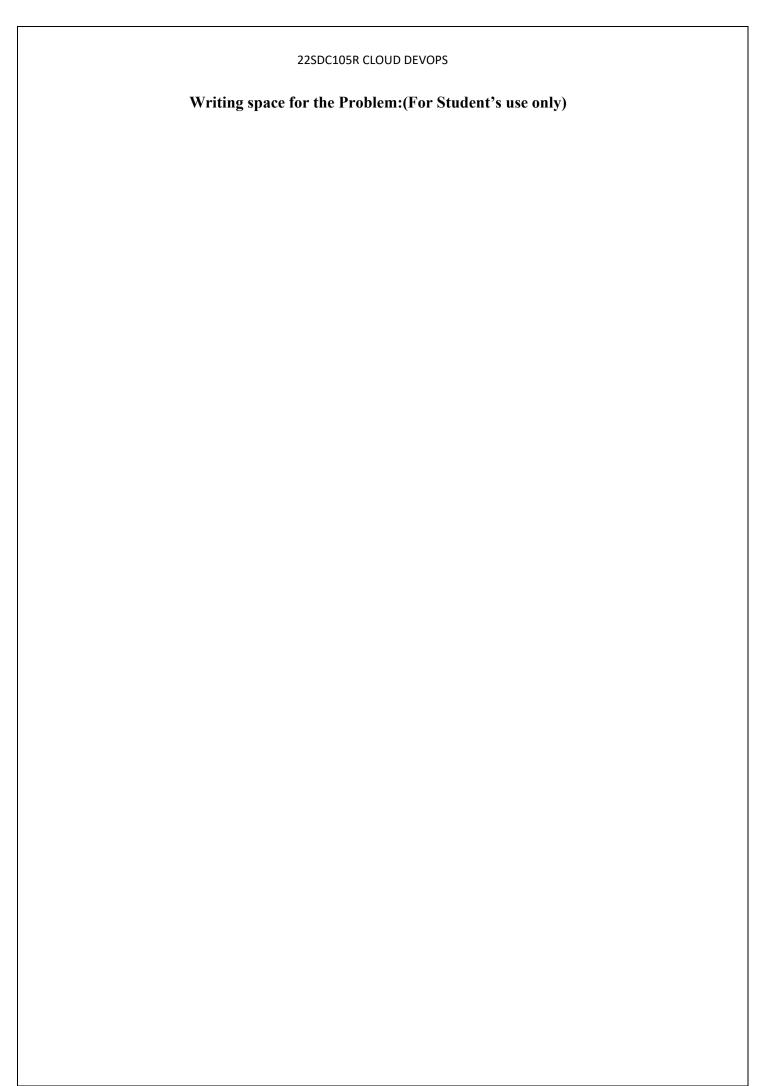
# In Lab Task:

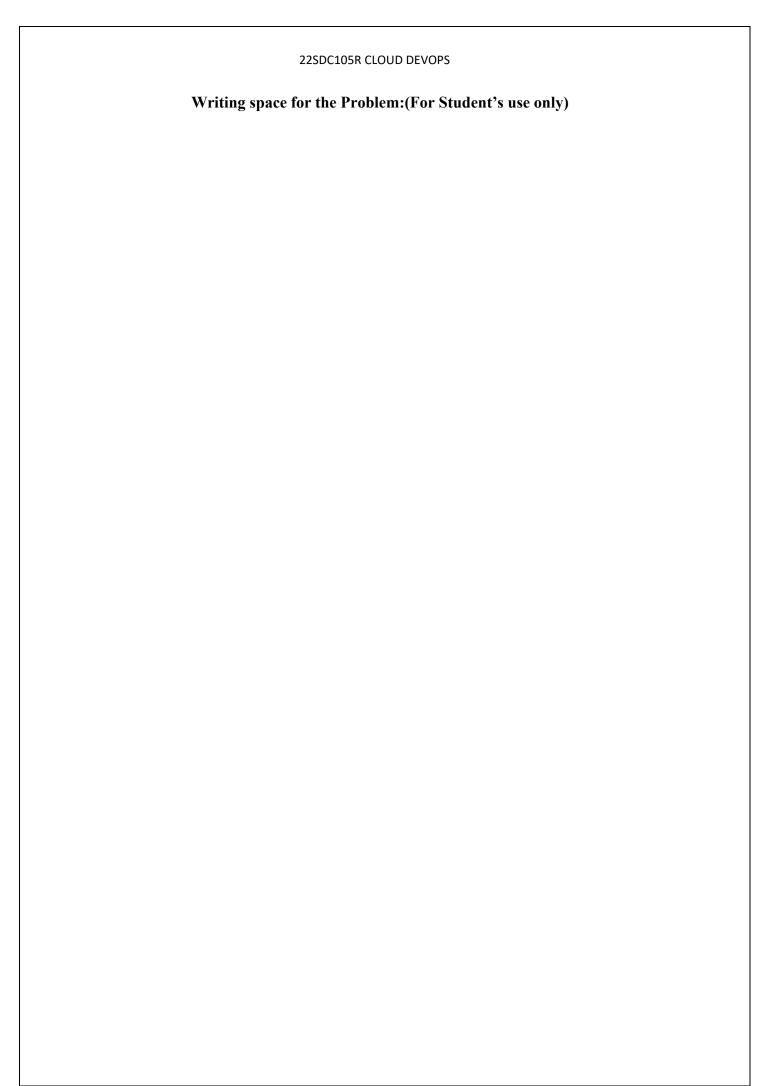
- 1) Install Ansible on a control node and configure two managed servers for use with Ansible
- 2) Build a basic inventory and execute an Ansible command to verify the configuration
- **3)** Configure a playbook to install git in worker node

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## **Post Lab Task:**

- a. What other Ansible modules would you use to configure a web server (e.g., for SSL setup, firewalls, or database configuration)?
- b. Explain how you would secure sensitive data, such as passwords, in your Ansible playbooks.
- c. If a task fails during playbook execution, how would you troubleshoot the error, and what tools or Ansible features can assist in debugging?





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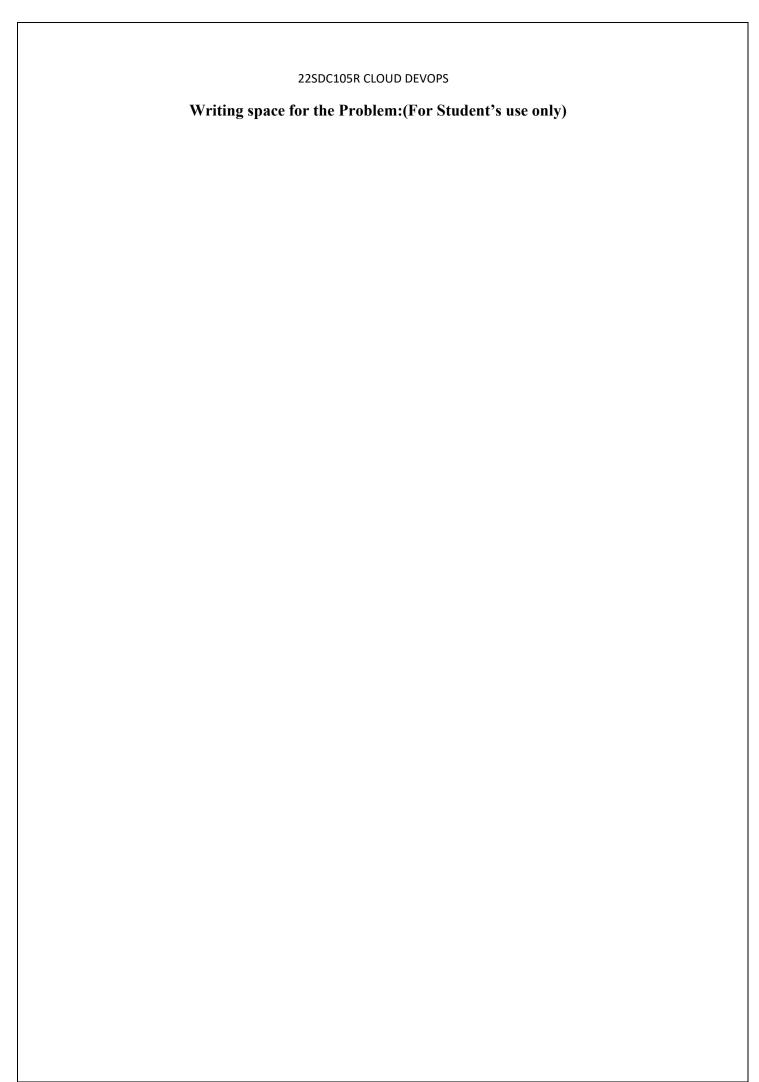
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Date of the Session://	Time of the Session:to
Prerequisite:	
Pre-Lab Task:	
1) What are the main steps to install Docker Docker on Windows?	on Ubuntu? How do they differ from the steps to inst
Ans:-	
2) When installing Docker on Windows, why Subsystem for Linux 2)?	y is it necessary to enable Hyper-V or WSL 2 (Window
Ans:-	

# In Lab Task:

- 1) Install Docker in EC2 ubuntu machine.
- 2) Builds an nginx image
- 3) Push the image to Docker Hub.
- 4) Explore Docker Hub for the pushed images.
- 5) website and get them into your development environment and practice.

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Post Lab Task:
<ol> <li>Describe the purpose of Docker Desktop on Windows. How does it differ from the Docker Engine installed directly on Ubuntu? Hint: Consider the role of Docker Desktop in managing containers and the virtual machine- based architecture on Windows.</li> </ol>



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1) Explain the three-tier architecture. What are the tiers in your web application?  Ans:-	te of the Session://	Time of the Session:to
<ul> <li>Docker Daemon</li> <li>Docker CLI</li> <li>Desktop Docker</li> </ul> re-Lab Task: <ul> <li>Explain the three-tier architecture. What are the tiers in your web application?</li> <li>Ans:-</li> </ul> 2) What are the benefits of using Docker in a web application deployment?	erequisite:	
• Desktop Docker  re-Lab Task:  1) Explain the three-tier architecture. What are the tiers in your web application?  Ans:-  2) What are the benefits of using Docker in a web application deployment?	• Docker Daemon	
Te-Lab Task:  1) Explain the three-tier architecture. What are the tiers in your web application?  Ans:-  2) What are the benefits of using Docker in a web application deployment?		
<ol> <li>Explain the three-tier architecture. What are the tiers in your web application?         Ans:-     </li> <li>What are the benefits of using Docker in a web application deployment?</li> </ol>		
Ans:-  2) What are the benefits of using Docker in a web application deployment?		
2) What are the benefits of using Docker in a web application deployment?	1) Explain the three-tier architecture. What a	are the tiers in your web application?
	Ans:-	
Ans:-		a web application deployment?
	Ans:-	

# In Lab Task:

- 1) Push and Pull your own image with pre-installations to/from repository
- 2) Building Container Images Using Docker files3) Create a Docker Container Network

# **Post Lab Task:**

1) Storing Container data in docker volume	1)	Storing	Container	data in	docker	volume
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2) Host three tier web application using Docker

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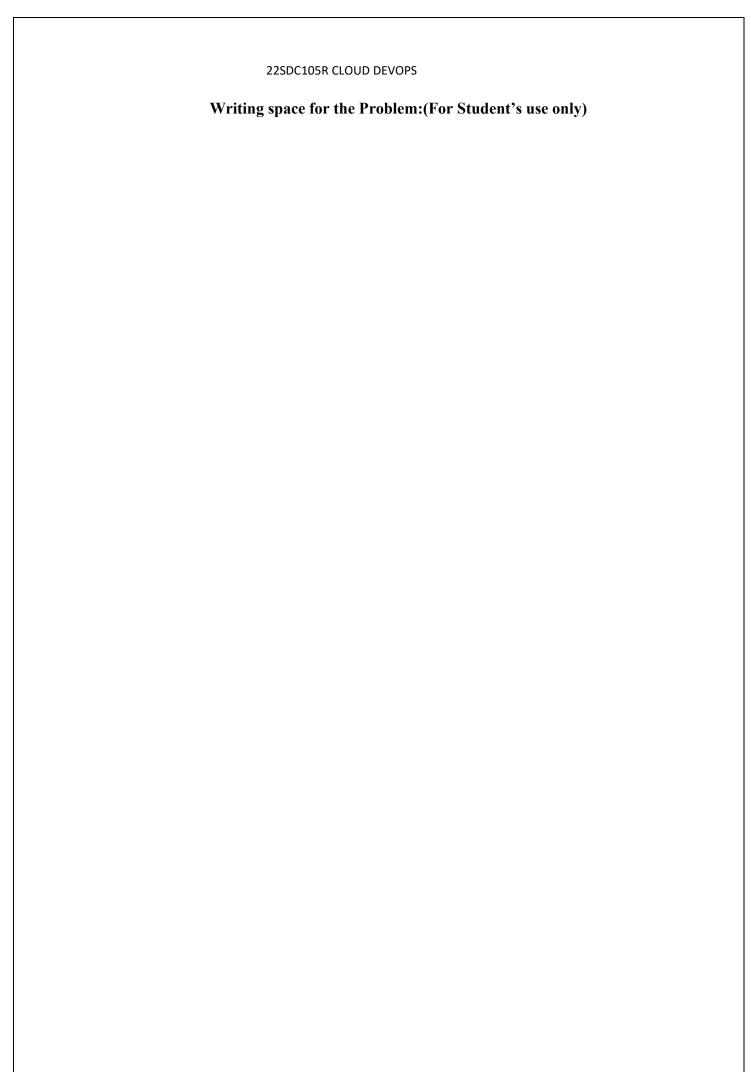
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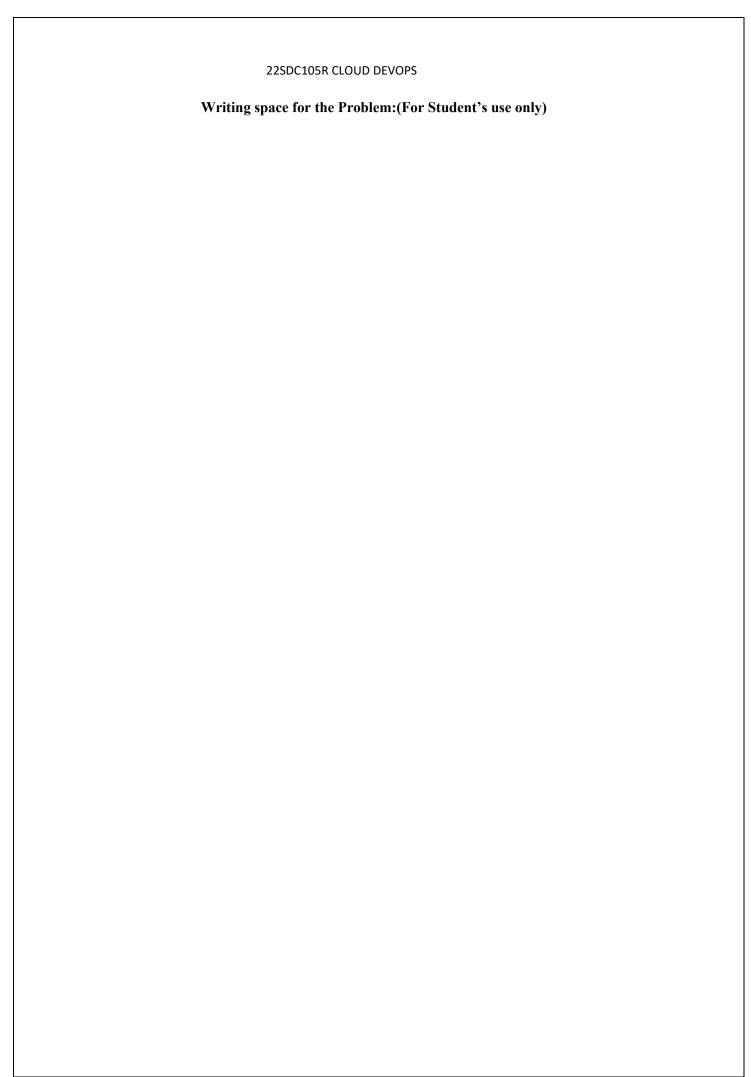
e of the Session://	Time of the Session:	to
<u>cequisite:</u>		
• Linux Environment.		
• Idea of VM.		
• Docker		
e-Lab Task:  1) What is Kubernetes, and why is it use.  Ans:-	sed in deploying applications?	
2) Differentiate Load Balancer and AnAns:-	uto Scaling?	
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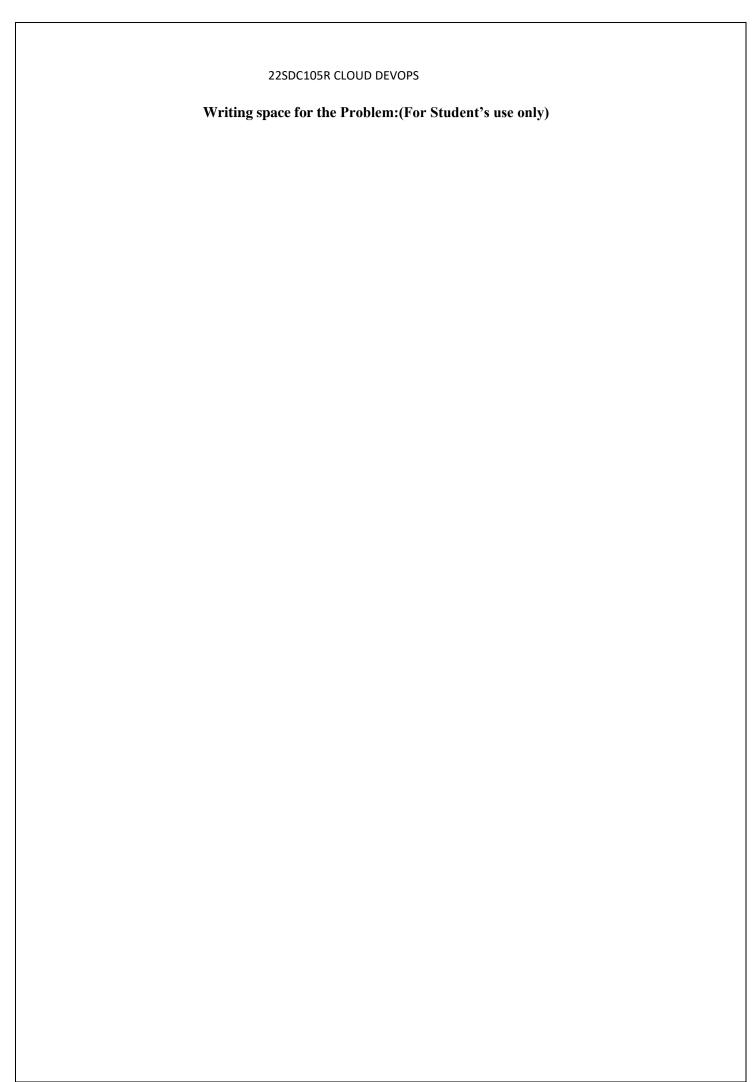
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<u>In La</u>	ab Task:
1)	Install minikube Build a simple Kubernetes cluster with one master node and two worker nodes
2)	Build a simple Rubernetes cluster with one master node and two worker nodes

# Post Lab Task

- 1) Build a simple Kubernetes cluster with one master node and two worker nodes using Kubeadm
- 2) Create a deployment that uses the NGINX image
- 3) Expose only one pod on port 8081
- 4) Verify the NGINX version on the pod
- 5) Create a service for the deployment on port 80







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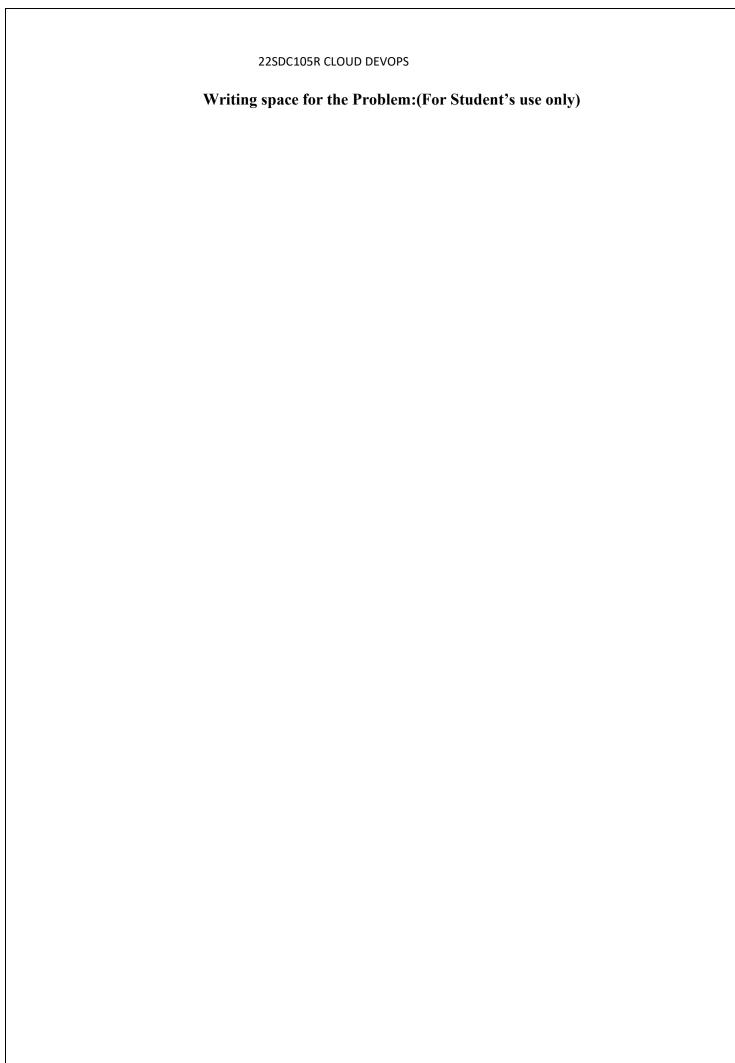
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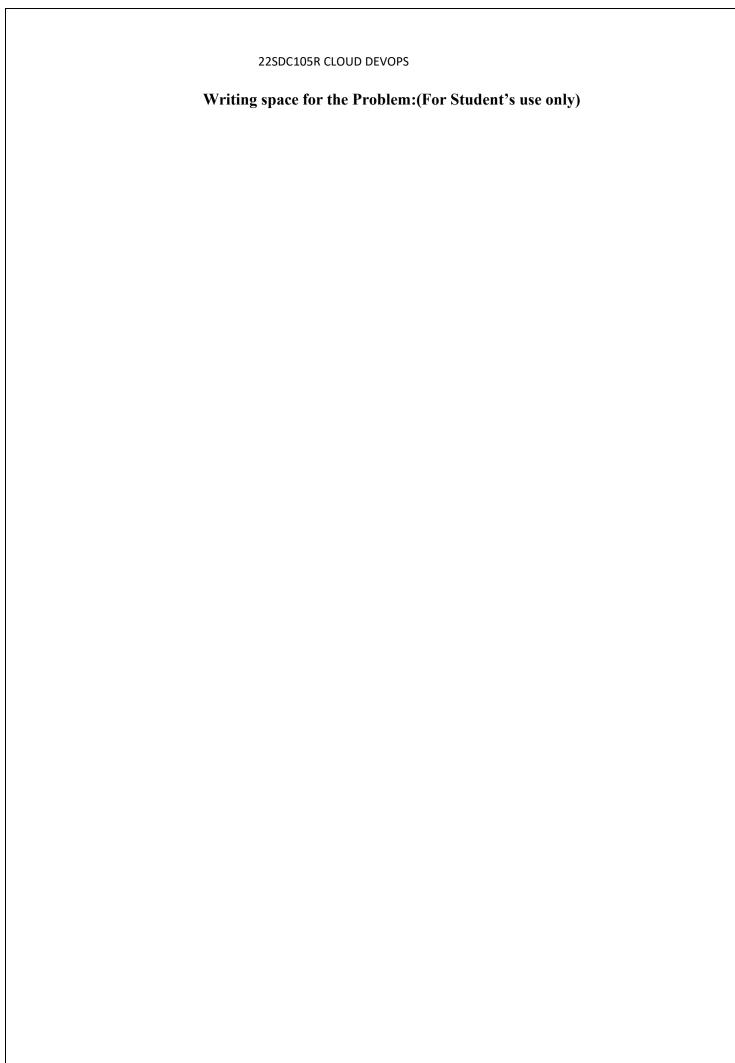
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tion:

LAB 08: Install a Web Application on I Date of the Session://		
Prerequisite:		
• Linux Environment.		
• Idea of VM.		
• Docker		
Pre-Lab Task:		
1) What is the role of a Kubernetes Deploymen Ans:-	nt in managing web application	ons?
2) What are the key components of Kubernetes, an Ans:-	d what roles do they play in man	naging applications ?

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In Lab Task:					
1) Deploy a	Web Applicati	ion using AW	S Kubernetes	Services	





# PostLab Task:

1) How does Amazon EKS work?

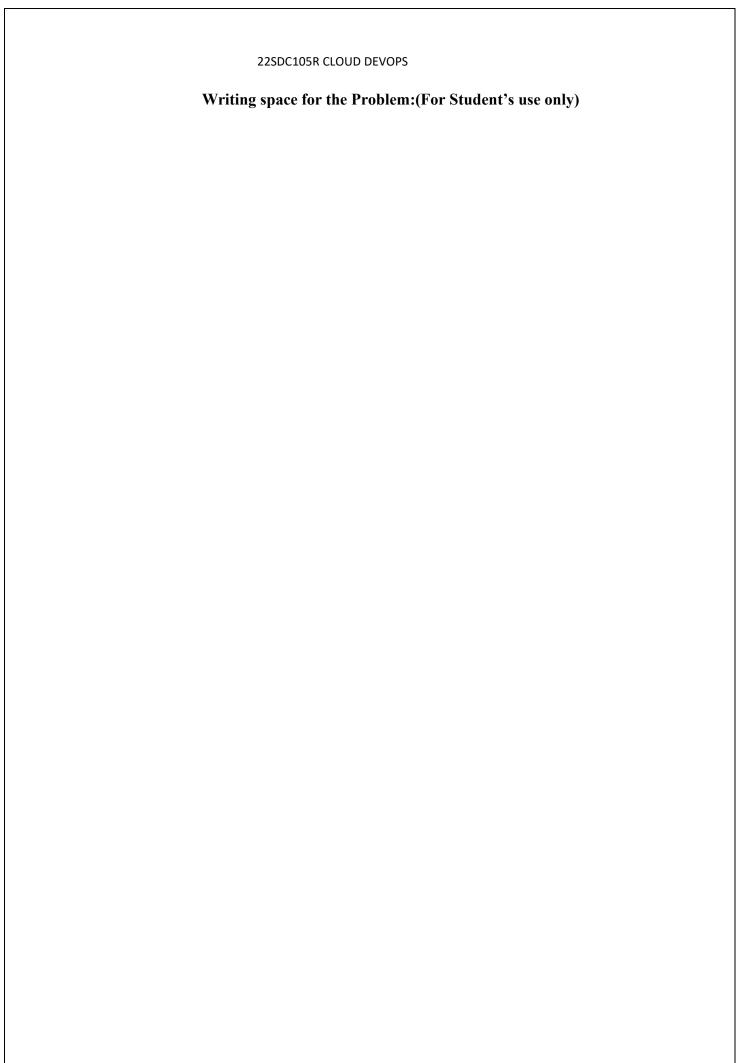
2) Does Amazon EKS work with my existing Kubernetes applications and tools?

3) Can I update my Kubernetes cluster to	a new version?
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LAB 09 :Jenkins Installation and Configuring on EC2 Ubuntu  Date of the Session:/ Time of the Session:to
<ul> <li>Prerequisite:</li> <li>Overview and Applications of DevOps in Development life cycle.</li> <li>Overview of Git.</li> <li>Web App Development.</li> <li>Python Programming.</li> </ul>
Pre-Lab Task:
1) What are the stages in DevOps Lifecycle and briefly explain each stage
Ans:-
2) What are the benefits of DevOps and In what way DevOps can achieve the goals of cloud computing.
Ans:-

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<ul><li>In Lab Task:</li><li>1) Jenkins Installation and Co</li></ul>	onfiguring on ubuntu.	

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PostLab Task:					
1) Building CI/CD	pipeline to deplo	y new version	of Application	on (Jenkins)	



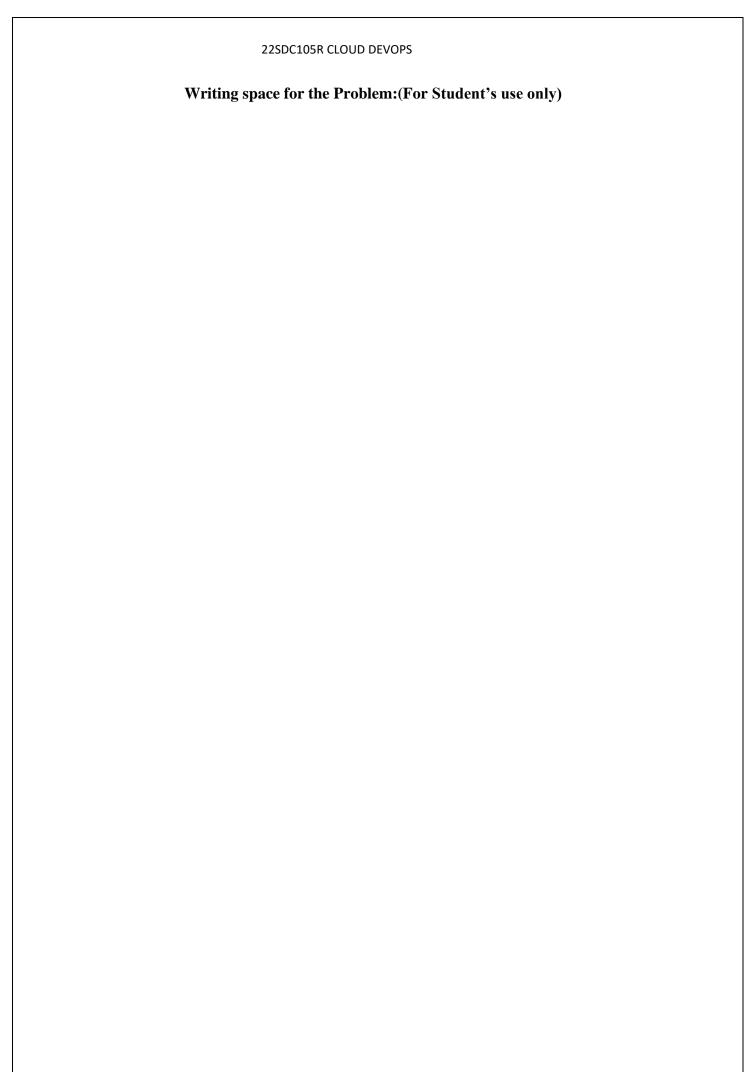
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of the Session://	Time of the Session:	_to
equisite:		
Lab Task:		
Categorise the DevOps tools and technolo Lifecycle.	ogies that are used, according to the stage	s in the DevOps
:-		
What Explain at least 2 tools and their lin stage.	nitations that are used in the DevOps Life	ecycle at each
<b>:-</b>		
Define CI/CD and List out the benefits of	f CI/CD	
	CI/CD.	
<b>:-</b>		
	equisite: DevOps life cycle. Web Development. Lab Task: Categorise the DevOps tools and technolol. Lifecycle. :-  What Explain at least 2 tools and their lirestage. :-	Pequisite: DevOps life cycle. Web Development. Lab Task: Categorise the DevOps tools and technologies that are used, according to the stage Lifecycle. :- What Explain at least 2 tools and their limitations that are used in the DevOps Life stage. :-

In Lab Task:	22SDC105R CLC	OUD DEVOPS		
1) Continuous Integra	ation with Jenkins	:		



D 4 '	Da ala.					
Post '	<u>l'ask:</u> )   Explain Kube	ernetes, and how	can vou integra	ate Ienkins witl	n Kubernetes?	
•	Lapiani Ruoc	incres, and now	can you micgi	tte Jenkins with	i Rubellietes.	

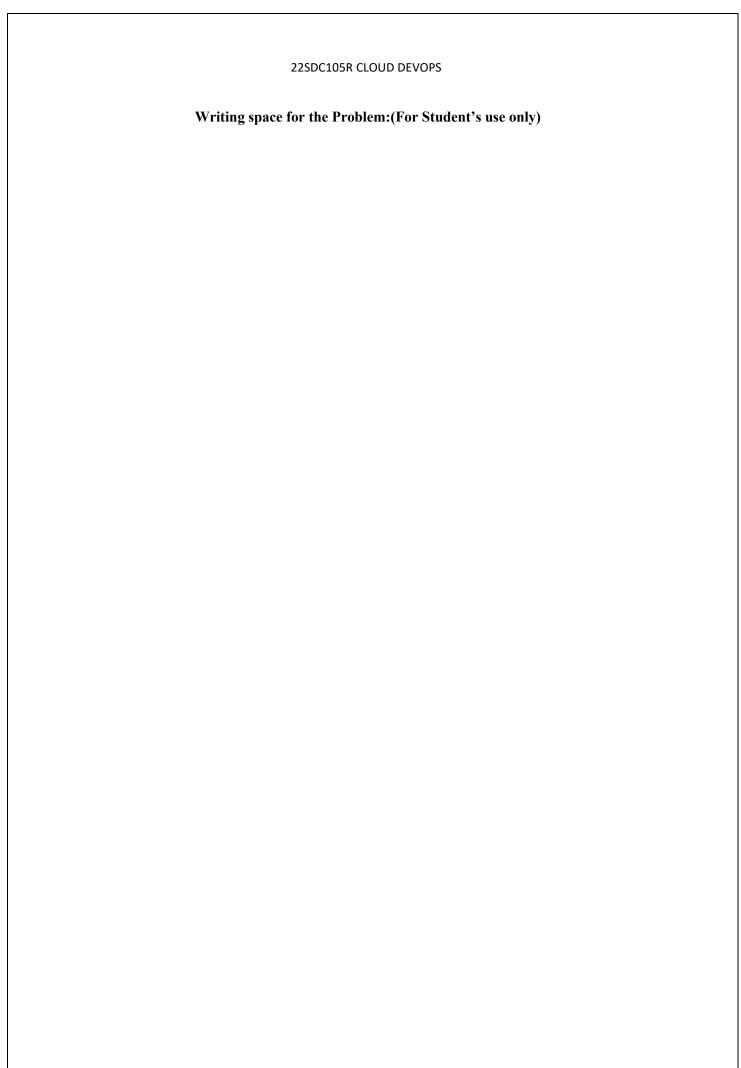
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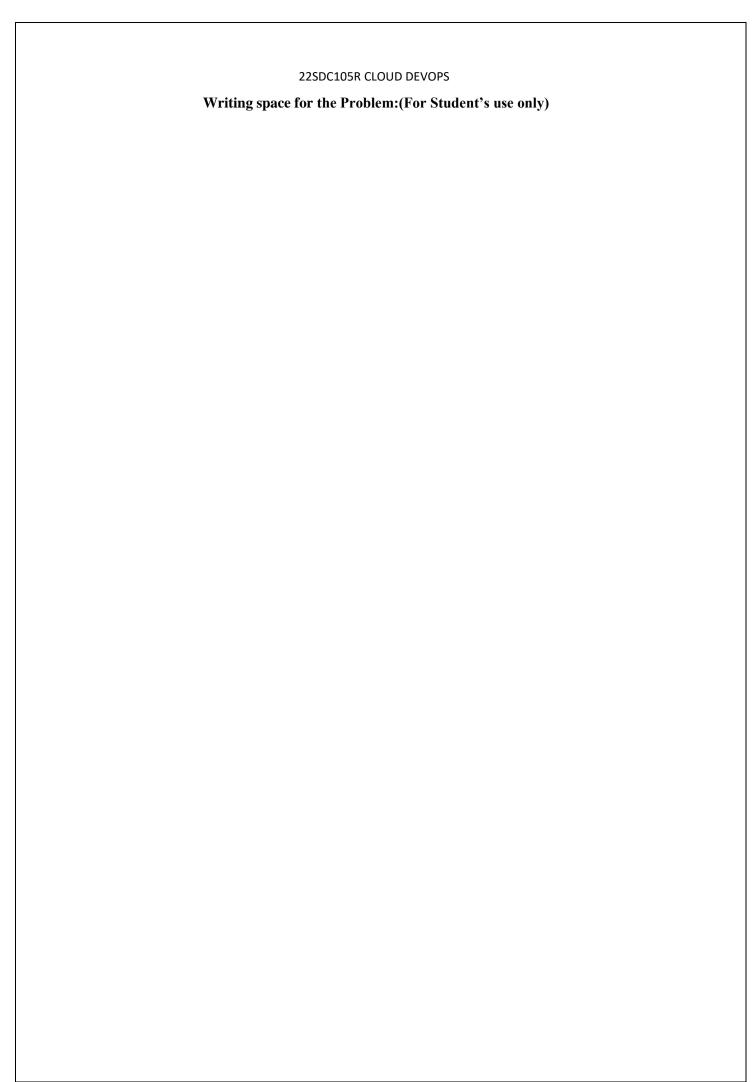
LAB 11 :Continuous Deployment Using AV	<b>VS Pipeline</b>	
Date of the Session://	Time of the Session:	to
Prerequisite:		
• Linux Environment.		
• Idea of VM.		
• AWS Environment and tools.		
• Git and GitHub.		
Pre-Lab Task:  1) In DevOps, what role does pipeline? Ans:-  2) What is CI and CD in AWS? Ans:-		
3) What type of applications does AWS deploy Ans:-	?	

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In Lab T	'ask:					
1) Se	t up a Contin	uous Deploy	ment Pipeli	ne using Jen	kins	



# 22SDC105R CLOUD DEVOPS Post Lab Task: 1) Create a static HTML web app in AWS for Devops Operations: A Practical.





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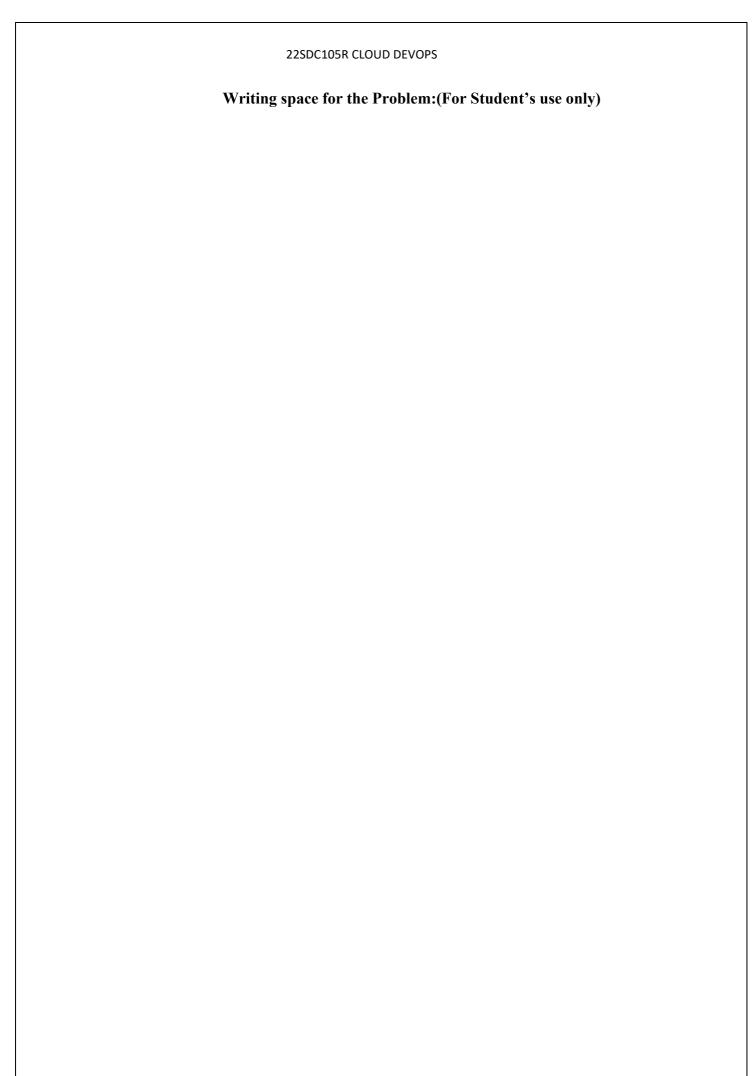
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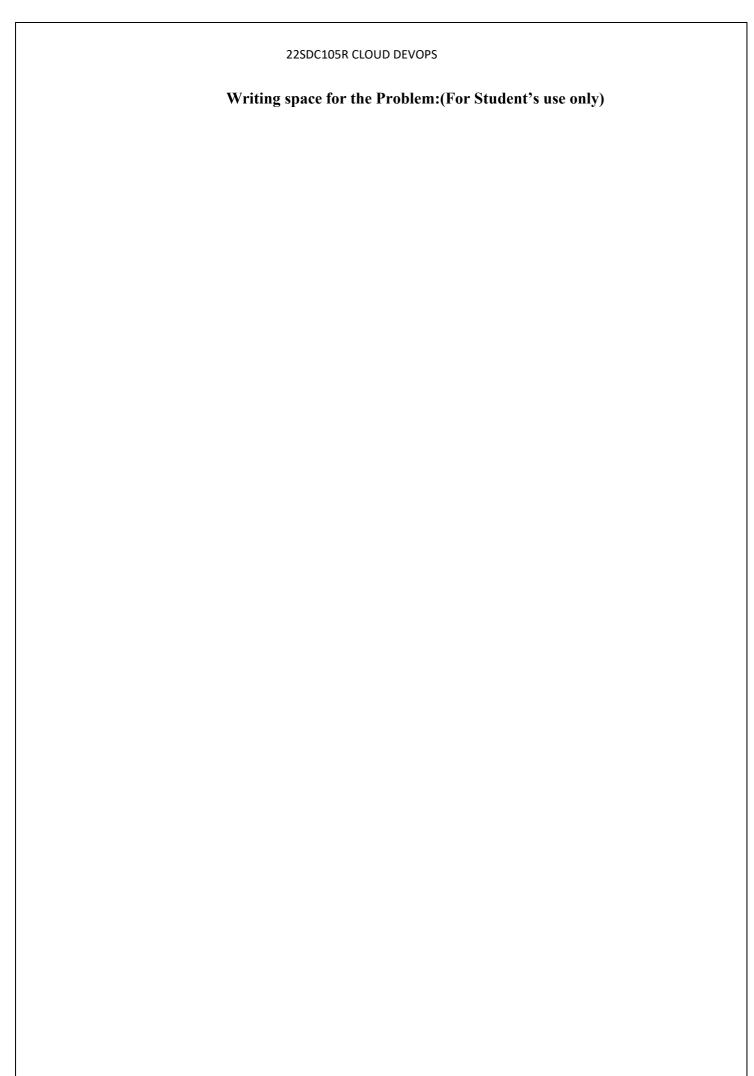
# LAB 12: Working with Nagios Monitoring Tool in EC2 ubuntu Date of the Session: / / Time of the Session:\_\_\_to\_\_ **Pre-Lab Task:** 1) What is Continuous Monitoring Ans:-2) Role of Monitoring Systems Ans:-3) Types of Monitoring Ans:-4) List out Popular Monitoring Tools Ans:-

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nitoring Tool:		

In Lab Task: 1. Working with Nagios Mon

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	What is t	he necessi	ty of Con	tinuous m	nonitoring	7		
1.	What is	ine necessi	ly of Con	undous n	iomtoring	•		





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