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Department of Information Technology

A.Y. 24-25

Advance DevOps Lab

Experiment No.	01
Experiment Title.	To understand the benefits of Cloud Infrastructure and Setup AWS Cloud9 IDE, Launch AWS Cloud9 IDE and Perform Collaboration Demonstration.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO1: To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements
Signature:	
Grade:	A

— Arnav S. Sawant
D15A
Roll no:- 53

Advance-DevOps-Experiment 1A

Aim:- To host static and dynamic website on Amazon S3 and EC2. Pg-2

Theory:- An S3 bucket is a scalable storage container provided by AWS for storing objects such as files, images, and backups. It operates in Amazons Simple Storage Service (S3) and allows users to store and retrieve any amount of data from anywhere on the web. S3 buckets are highly durable and secure, supporting features like versioning, encryption and access control. They are widely used for variety of applications including data archiving, static website hosting and big-data analytics offering seamless integration with other AWS services and a pay-as-you-go Pricing model.
Amazon EC2 (Elastic Compute cloud) is web service provided by Amazon Web Services that offer resizable virtual servers known as instances in cloud. It allows users to run applications on a scalable and secure infrastructure without need of physical hardware. With EC2 users can select different instance types based on their computational needs from general-purpose to compute-optimized or memory-optimized instances.

Conclusion:- 1) ~~It~~ I was not knowing about S3 & EC2 so i had learn a bit about them, then i referred to one of the ~~yt~~ youtube videos, then i got to know, and then i executed it.

- Arnav S. Sawant
D15A
Roll-no:-53

Advance-DevOps-Experiment-1B

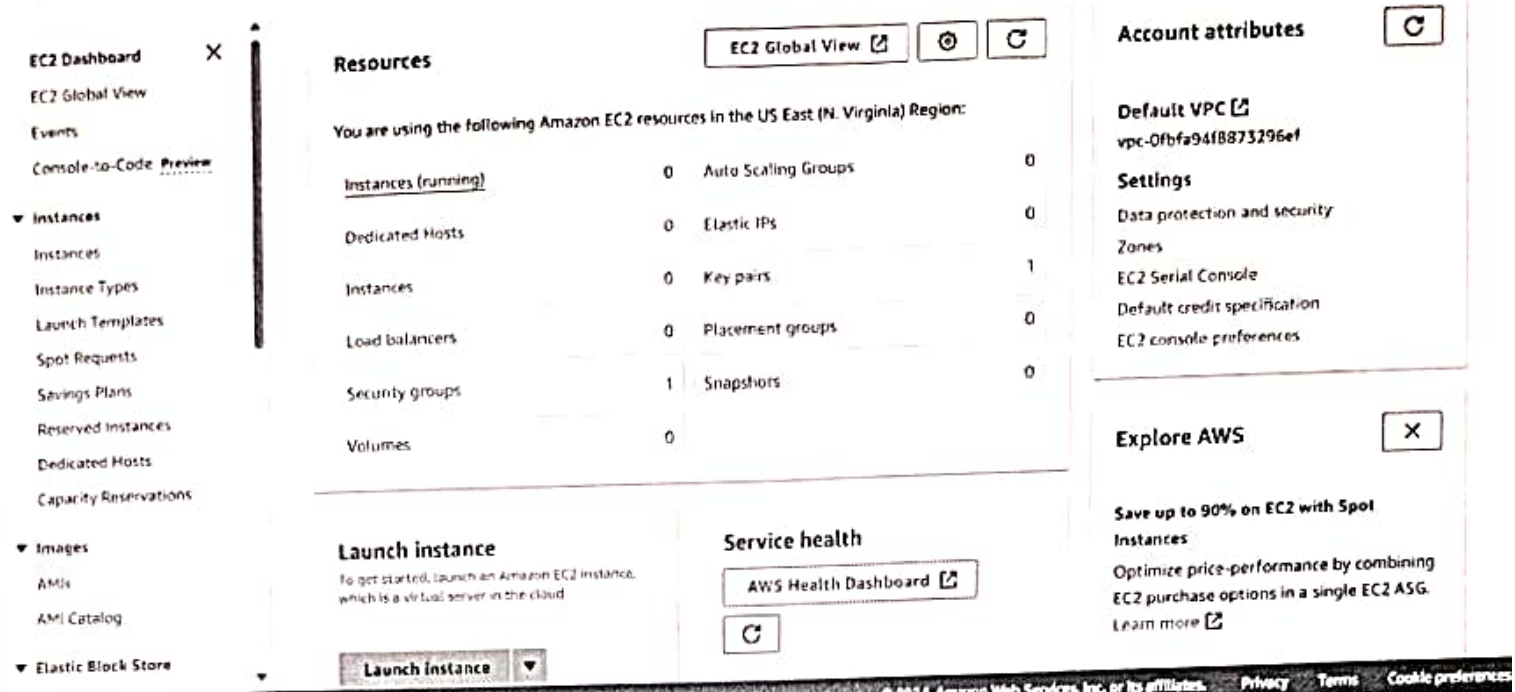
Aim:- To understand the benefits of cloud 9 infrastructure and setup AWS cloud9 IDE, Launch AWS cloud9 IDE and perform collaboration demonstration.

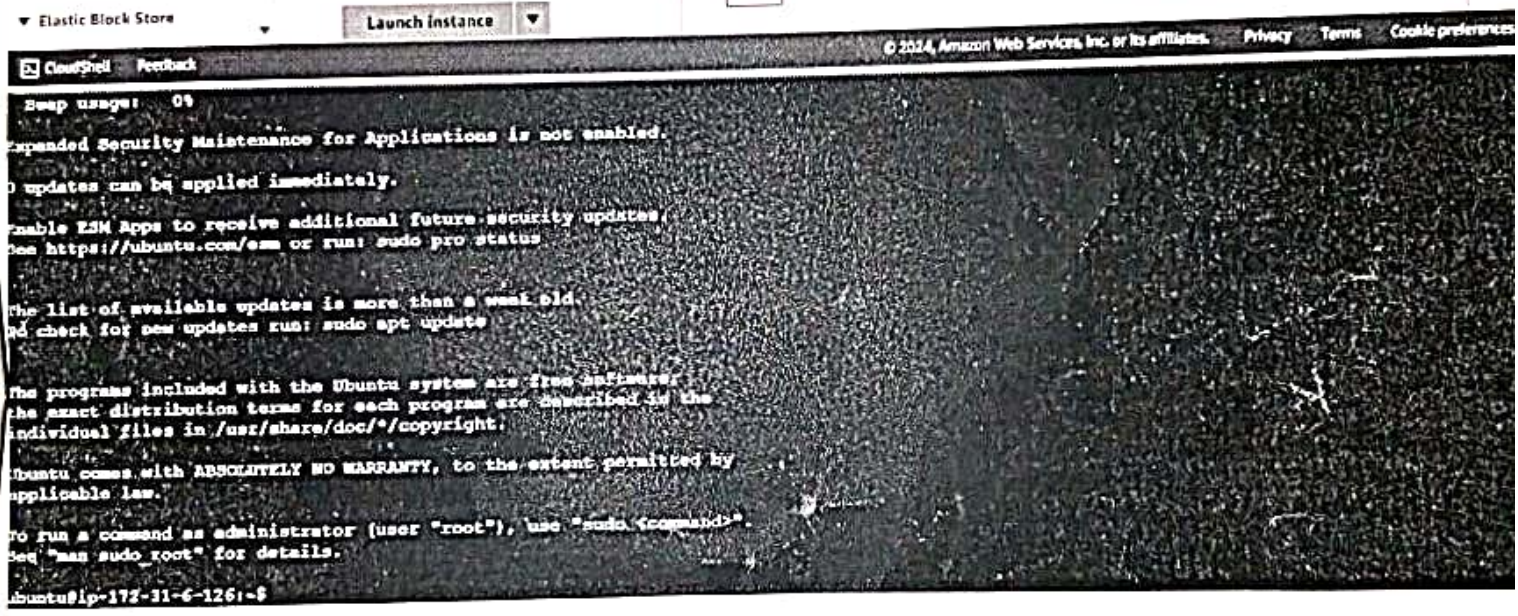
Theory:- AWS cloud9 is a cloud based integrated development environment (IDE) that lets you write, run and debug your code with just a browser, it includes a code editor, debugger and terminal. Cloud9 comes prepackaged with essential tools for popular programming languages, including JavaScript, Python, PhP and more so you dont need to install files or configure your development machine to start new projects.

Since your cloud9 IDE is cloud-based you can work on your projects from your office home or anywhere else using internet connected machine. Cloud9 also provides a seamless experience for developing serverless applications enabling you to easily define resources, debug and switch between local and remote execution of serverless application with cloud9, you can quickly share your development environment with your team, enabling you to pair program and track each others inputs in real time.

Conclusion:- I learned about cloud9 from internet and watching a yt-video and implementing it.

xp - 11





i-03472a028ec313b14 (Arnav's server)

PublicIPs: 3.238.81.165 PrivateIPs: 172.31.6.126

```
ubuntu@ip-172-31-6-126:~$ mkdir arnav
ubuntu@ip-172-31-6-126:~$ cd arnav
ubuntu@ip-172-31-6-126:~/arnav$ cd ..
ubuntu@ip-172-31-6-126:~$ cd arnav
ubuntu@ip-172-31-6-126:~/arnav$ mkdir app1
ubuntu@ip-172-31-6-126:~/arnav$ cd app1
ubuntu@ip-172-31-6-126:~/arnav/app1$
```

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Advance DevOps Lab

Experiment No.	02
Experiment Title.	To Build Your Application using AWS CodeBuild and Deploy on S3 / SEBS using AWS CodePipeline, deploy Sample Application on EC2 instance using AWS CodeDeploy.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO1:To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements
Signature:	
Grade:	A

- Aryan S. Sawant
D15A Rollno:-53

Advance-DevOps-Experiment 2 (A)

Aim:- To build application using AWS codebuild & Deploy on S3/ using SEBS AWS Codepipeline, deploy Sample Application on EC2 instances using AWS CodeDeploy.

Theory:-

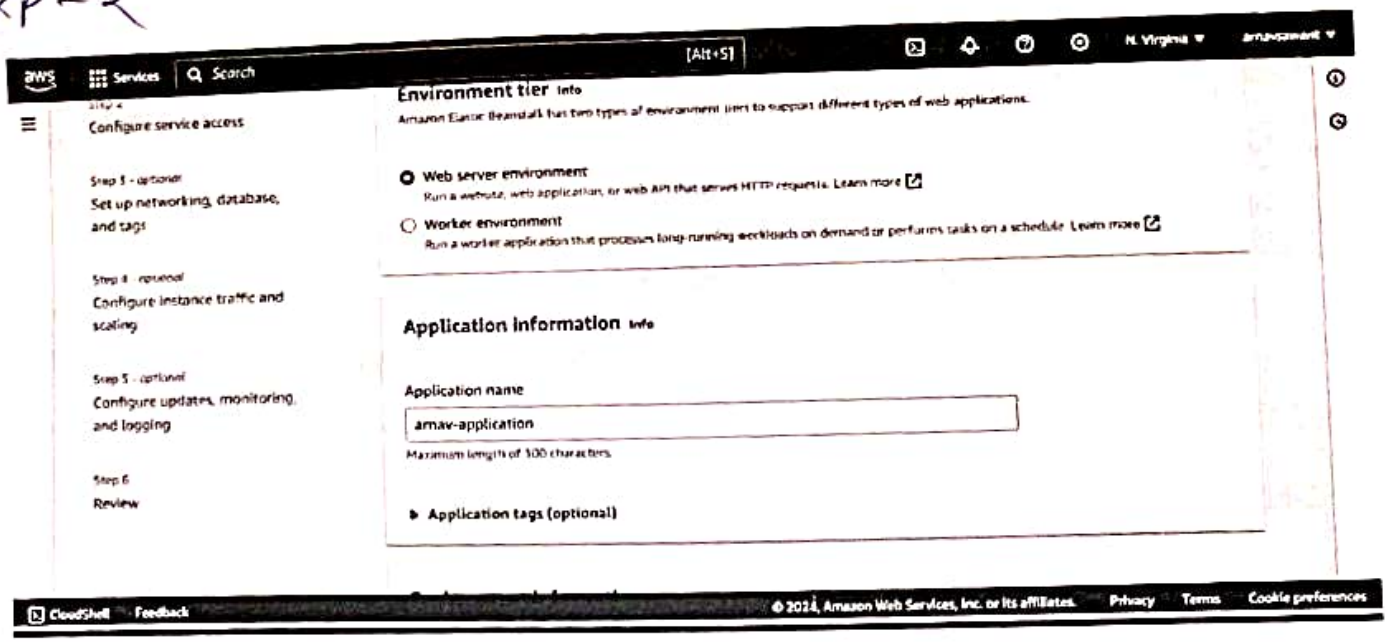
1) **AWS Elastic Beanstalk:-** It is a managed service that simplifies the deployment, scaling and management of web applications. It abstracts the underlying infrastructure, allowing developers to focus on coding.

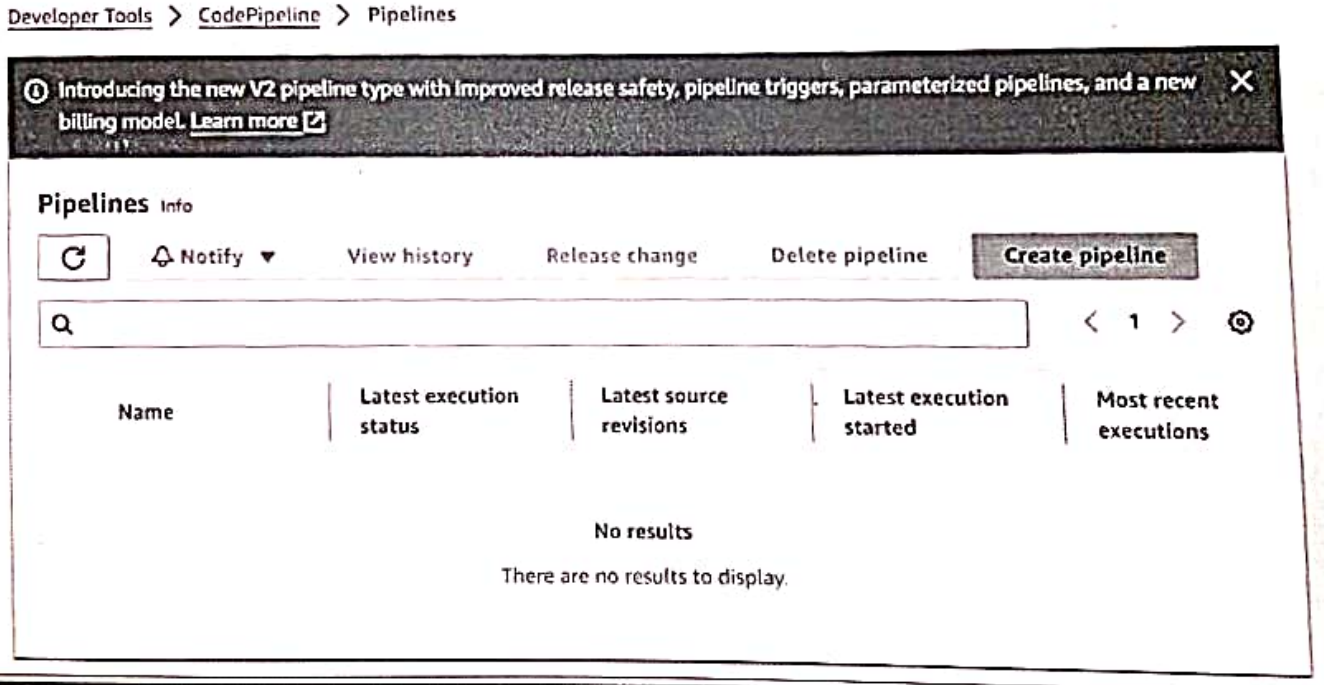
2) **AWS Codepipeline:-** It is CI/CD service that automates the build, test & deployment stages of the software release process. It integrates with various AWS services including Elastic Beanstalk.

Conclusion:-

- I learned about ~~Integrating~~ AWS codepipeline along with Elastic Beanstalk on the Internet also I learned about it on youtube.

xp-2


Services
Search
[Alt+S]
N. Virginia
Configure service access
Step 3 - optional
Set up networking, database, and tags
Step 4 - optional
Configure instance traffic and scaling
Step 5 - optional
Configure updates, monitoring, and logging
Step 6
Review
Environment tier Info
Amazon Elastic Beanstalk has two types of environment tiers to support different types of web applications.
Web server environment
Run a website, web application, or web API that serves HTTP requests. Learn more
Worker environment
Run a worker application that processes long-running workloads on demand or performs tasks on a schedule. Learn more
Application information Info
Application name
amav-application
Maximum length of 100 characters.
Application tags (optional)
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


Developer Tools > CodePipeline > Pipelines
Introducing the new V2 pipeline type with improved release safety, pipeline triggers, parameterized pipelines, and a new billing model. Learn more
Pipelines Info
Notify
View history
Release change
Delete pipeline
Create pipeline
1
Name
Latest execution status
Latest source revisions
Latest execution started
Most recent executions
No results
There are no results to display.


Congratulations!
You have successfully created a pipeline that retrieved this source application from an Amazon S3 bucket and deployed it to three Amazon EC2 instances using AWS CodeDeploy.
For next steps, read the AWS CodePipeline Documentation, Incedge 2020

Exp-1

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Advance DevOps Lab

Experiment No.	03
Experiment Title.	To understand the Kubernetes Cluster Architecture, install and Spin Up a Kubernetes Cluster on Linux Machines/Cloud Platforms
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO2: To deploy single and multiple container applications and manage application deployments with rollouts in Kubernetes
Signature:	
Grade:	A+

9 — Arnav . S. Sawant
D15A
Roll no:-53

Advance-DevOps-Experiment-3

Aim:- To understand the Kubernetes cluster Architecture install and spin up a Kubernetes cluster on Linux Machines / cloud Platforms.

Theory:- Kubernetes is a powerful open-source platform for managing containerized application across multiple hosts. It provides an abstraction layer for deploying and scaling applications ensuring high availability and fault tolerance. The Kubernetes cluster architecture consist of several keys component divided into 2 major categories

1) Master Node 2) Worker Node.

- **Master Node Component:-** The master node is responsible for managing entire Kubernetes cluster. It acts as brain of cluster, orchestrating container deployment, Scaling and communication between nodes. control panel.

API server:- acts as frontend for Kubernetes

Scheduler:- Responsible for distributing workload across cluster

Controller Manager:- Ensures desired state of cluster matches actual state.

Cloud control Manager:- Integrates cloud specific API into Kubernetes.

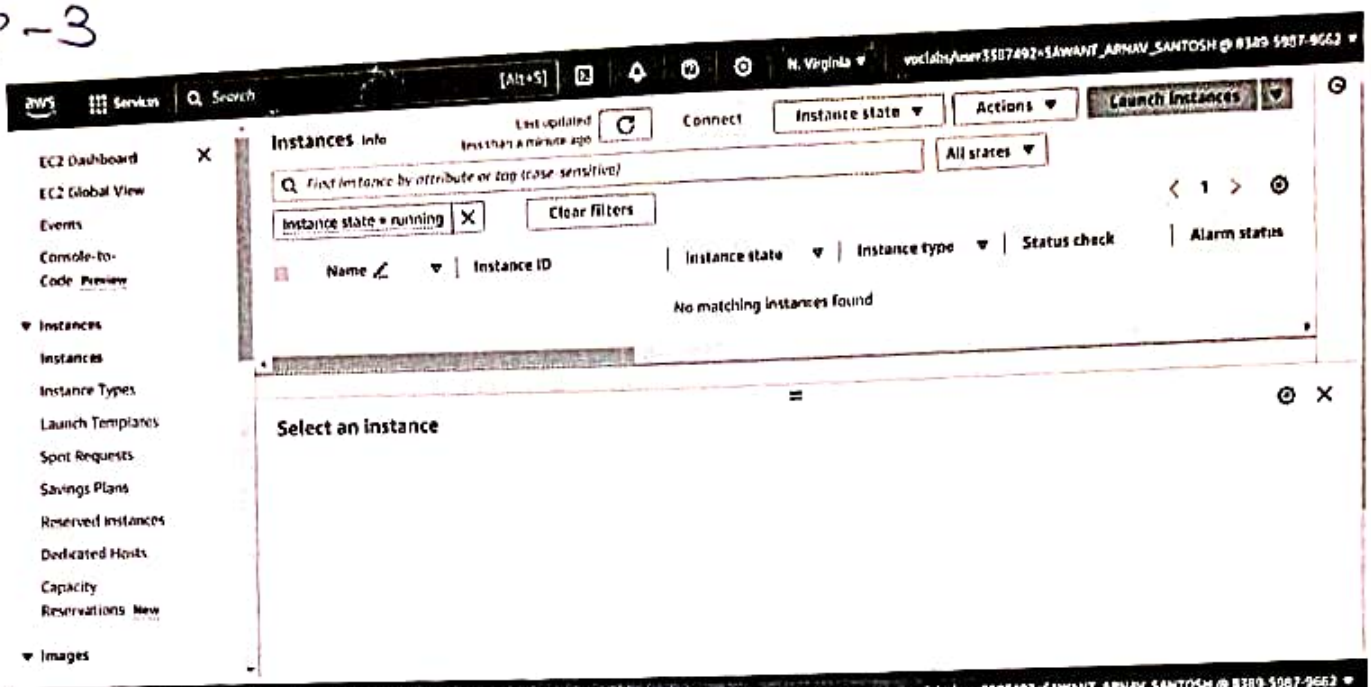
- **Worker Node component:-** The worker node are where your applications run. Each worker node communicates with master node and executes commands given.

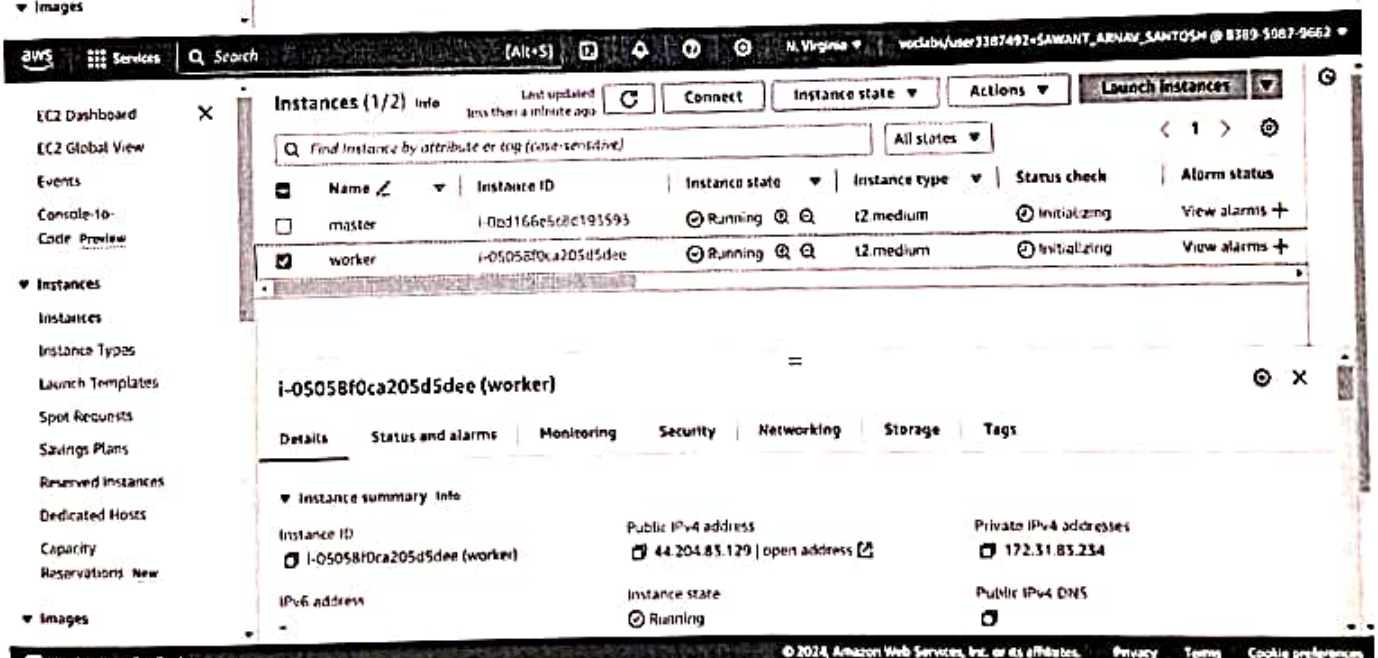
~Exp 3 part 2

Kubelet - Primary agent that run on each worker node.
Kube-Proxy - Manage networking for worker node
Container-Runtime - Responsible for pulling container image and running the container.
Pods - Smallest deployable unit in kubernetes.

Conclusion :- 1) It was quite a challenge for me to add security groups to the "master" i was a bit confused in that so i referred to one of my friend's doc and then i solved that error.

Exp-3






```
ubuntu@ip-172-31-86-195:~$ kubectl get nodes
NAME                STATUS   ROLES           AGE   VERSION
ip-172-31-86-195    Ready    control-plane   13m   v1.29.0
ip-172-31-90-68     Ready    <none>          42s   v1.29.0
```

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Advance DevOps Lab

Experiment No.	04
Experiment Title.	To install Kubectl and execute Kubectl commands to manage the Kubernetes cluster and deploy Your First Kubernetes Application.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO2: To deploy single and multiple container applications and manage application deployments with rollouts in Kubernetes
Signature:	
Grade:	A+

B - Arnav S. Sawant
D15A
Roll-no:-53

Advance-DevOps-Experiment 4

Aim:- To install kubectl and execute kubectl command to manage the kubernetes cluster and deploy your first kubernetes application.

Theory:- kubectl is a command line interface to interact with a kubernetes cluster. It allows users to manage cluster resources, deploy applications inspect and manage cluster components. Using kubectl you can communicate with kubernetes API Server to issue command and queries.

Kubernetes objects:-

1) Pods:- The smallest deployable unit in kubernetes. A pod encapsulates one or more containers that share same the network namespace and storage.

2) Deployments:- A kubernetes resource that defines how to create and manage pods. It ensures the specified numbers of pods replicas are running at any given time and handles updates and roll backs.

3) Services:- An abstraction that defines how to access the pods. A service allows you to expose your pods to internal or external client.

4) Replicasets:- Ensures that a specified number of pods replicas are running at all times. It is managed by deployment but can also be used independently.

Conclusion:- 1) While using nano nginx-deployment & service.yaml, my indentation was not proper so i had to that indentation by refering to the docs and then i was good to go.

Exp-4

```
ubuntu@ip-172-31-86-195:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/addons:/cri-o:/prerelease:/main/deb  InRelease
Hit:6 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.29/deb  InRelease
Reading package lists... Done
ubuntu@ip-172-31-86-195:~$ sudo apt-get install -y apt-transport-https ca-certificates curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apt-transport-https is already the newest version (2.7.14build2).
ca-certificates is already the newest version (20240203).
curl is already the newest version (8.5.0-2ubuntu10.4).
curl set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 139 not upgraded.
```

```
ubuntu@ip-172-31-86-195:~$ kubectl get deployments
NAME               READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment   3/3     3            3           3m34s
ubuntu@ip-172-31-86-195:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-9j7cb   1/1     Running   0          3m53s
nginx-deployment-86dcfdf4c6-fg8zb   1/1     Running   0          3m53s
nginx-deployment-86dcfdf4c6-p8m74   1/1     Running   0          3m53s
ubuntu@ip-172-31-86-195:~$ kubectl get services
NAME            TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
kubernetes      ClusterIP      10.96.0.1       <none>        443/TCP        58m
nginx-service   LoadBalancer   10.101.174.44   <pending>     80:31187/TCP   67s
ubuntu@ip-172-31-86-195:~$
```

Not secure 18.206.145.218:31187

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

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Advance DevOps Lab

Experiment No.	05
Experiment Title.	To understand terraform lifecycle, core concepts/terminologies and install it on a Linux Machine.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO3: To apply best practices for managing infrastructure as code environments and use terraform to define and deploy cloud infrastructure.
Signature:	
Grade:	AP

- Amar S. Sawant
Roll no:-53 D15A

Advance-DevOps Experiment - 5

Aim:- To understand terraform lifecycle, core concepts, terminologies and install it on a Windows machine.

Theory:- Terraform is an open source infrastructure as a code tool developed by HashiCorp. It allows users to define and provision infrastructure using a high level configuration language (HCL) or JSON. Terraform supports a wide range of cloud providers such as AWS, Azure, Google Cloud, enabling users to manage infrastructure across multiple environments consistently.

1. **Providers:-** They are plugins that allow terraform to interact with various API of cloud Providers. Each require configuration & manage resources for specific service.
2. **State:-** Terraform maintain a state file that keeps track of infrastructure managed by terraform.
3. **Variables:-** They are used to make configuration dynamic & reusable.
4. **Outputs:-** They are used to extract information from terraform-managed infrastructure and display it after the execution of terraform plan or apply.

Conclusion:- 1) Understanding about terraform, and learning about its commands from internet.
2) Overall it was just like downloading a software, there were almost no errors during execution.

Exp-5

```
Microsoft Windows [Version 10.0.22631.3958]
(c) Microsoft Corporation. All rights reserved.

C:\Users\[redacted]>terraform --version
Terraform v1.9.4
on windows_amd64

Your version of Terraform is out of date! The latest version
is 1.9.5. You can update by downloading from https://www.terraform.io/downloads.html
```

```
PS C:\Terraform> docker --version
Docker version 27.0.3, build 7d4bcd8
PS C:\Terraform>
```

```
PS C:\Terraform> terraform
Usage: terraform [global options] <subcommand> [args]

The available commands for execution are listed below.
The primary workflow commands are given first, followed by
less common or more advanced commands.

Main commands:
  init          Prepare your working directory for other commands
  validate      Check whether the configuration is valid
  plan          Show changes required by the current configuration
  apply         Create or update infrastructure
  destroy       Destroy previously-created infrastructure

All other commands:
  console       Try Terraform expressions at an interactive command prompt
  fmt           Reformat your configuration in the standard style
  force-unlock  Release a stuck lock on the current workspace
  get           Install or upgrade remote Terraform modules
  graph         Generate a Graphviz graph of the steps in an operation
  import        Associate existing infrastructure with a Terraform resource
  login         Obtain and save credentials for a remote host
  logout        Remove locally-stored credentials for a remote host
  metadata      Metadata-related commands
  output        Show output values from your root module
  providers     Show the providers required for this configuration
  refresh       Update the state to match remote systems
  show          Show the current state or a saved plan
  state         Advanced state management
  taint         Mark a resource instance as not fully functional
```

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Advance DevOps Lab

Experiment No.	06
Experiment Title.	To Build, change, and destroy AWS / GCP /Microsoft Azure/ DigitalOcean infrastructure Using Terraform.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	AdvanceDevOps
Lab Outcome	LO3: To apply best practices for managing infrastructure as code environments and use terraform to define and deploy cloud infrastructure.
Signature:	
Grade:	AT

— Arnav .S. Sawant
D15A
Roll-no:-53

Advance DevOps - Experiment-6

(A+ R)

19

Aim:- To Build, Change, and destroy AWS infrastructure using Terraform.

Theory:- Terraform is an open source tool that enables developers and operation team to define, provision and manage cloud infrastructure through code. When you build infrastructure using Terraform you define desired state of your infrastructure in configuration files. Terraform reads these configuration files and using specified cloud provider it provision necessary resource to mark desired state.

As need evolve you need to modify the existing infrastructure. Terraform makes it easy to implement changes by updating the configuration files to reflect new desired state. When certain resources are no longer needed, Terraform allows you to destroy them in a controlled manner. This might involve deleting an S3 bucket or terminating an EC2 instance running docker. Destroying infrastructure with terraform is beneficial because it helps avoid unnecessary cost associated with unused resources.

Conclusion:- 1) I had to refer to various documents and i learned about those terraform commands, there was slight error while learning about those commands.

2) I did "terraform init" 2 times which gave me error and then i solved those problems.

Exp-6

```
Microsoft Windows [Version 10.0.22631.3958]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Santosh Sawant>docker --version
Docker version 27.0.3, build 7d4bcd8

C:\Users\Santosh Sawant>
```

```
PS C:\Terraform scripts\Docker> docker images
REPOSITORY   TAG       IMAGE ID       CREATED        SIZE
nginx        latest    5ef79149e0ec   10 days ago    188MB
ubuntu       latest    edbfe74c41f8   3 weeks ago    78.1MB
```

```
PS C:\Terraform scripts\Docker> docker container list
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS          PORTS                    NAMES
96d0c83b0b6b   5ef79149e0ec   "/docker-entrypoint.…"   6 minutes ago    Up 6 minutes    0.0.0.0:8000->80/tcp     tutorial
```

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Advance DevOps Lab

Experiment No.	07
Experiment Title.	To understand Static Analysis SAST process and learn to integrate Jenkins SAST to SonarQube/GitLab.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO4:To identify and remediate application vulnerabilities earlier and help integrate security in the development process using SAST Techniques
Signature:	
Grade:	A+

~Arnav .S. Sawant
D15A Rollno:-53

AdvanceDevOps - Experiment No. 7

22 (1)

Aim:- To understand Static analysis SAST process and learn to integrate jenkins SAST to SonarQube / GitLab.

Theory:- Static Application Security Testing (SAST), or static analysis, is a testing methodology that analyzes source code to find security vulnerabilities that make your organization's applications susceptible to attack. SAST scans an application before the code is compiled. It is also known as white box testing.

Sonarqube → It is an open-source platform used for continuous inspection of code quality. It helps in identifying bugs, vulnerabilities, code smells and security hotspots in software projects. SonarQube supports multiple programming languages and integrates with various build systems and CI/CD pipelines, making it a powerful tool for improving code quality.

Conclusion:- 1) In the build steps, i selected "Execute SonarQube Scanner" but i did not knew what to do in Analysis Properties, so i referred to chatGpt for the same.

2) Again in the analysis properties, i put wrong "sonar.projectKey" i was not knowing that i had to put the one project that i was working on in sonarqube.

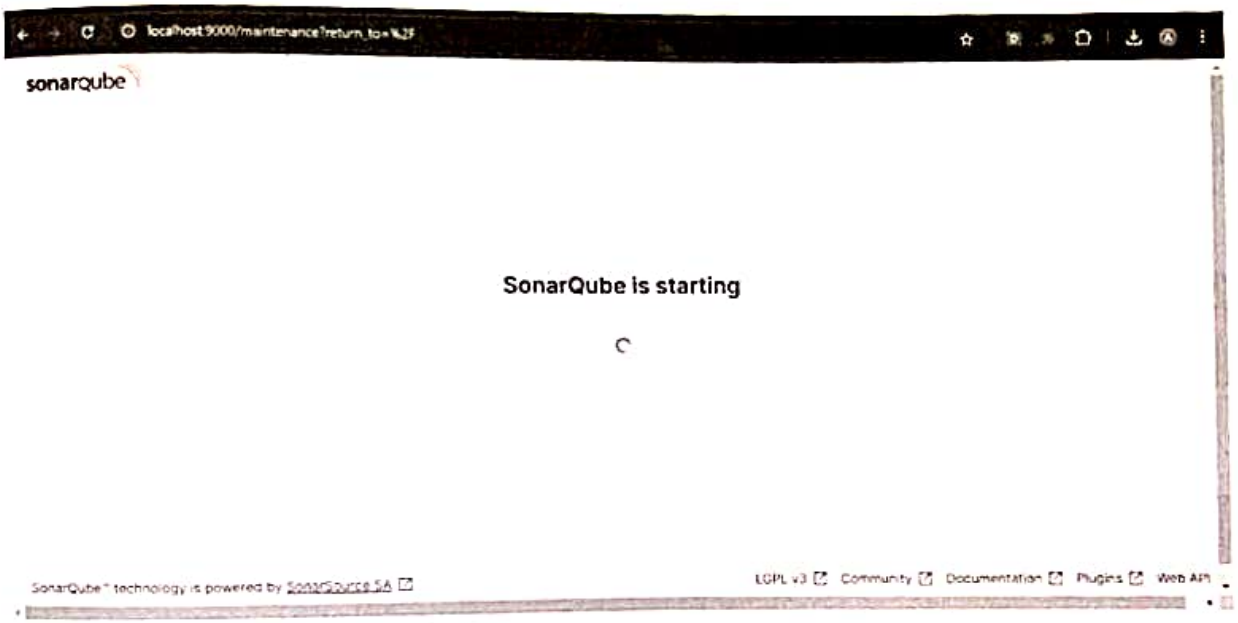
3) Also i was not knowing that i have to generate token for the sonarlogin but then i learnt about it.

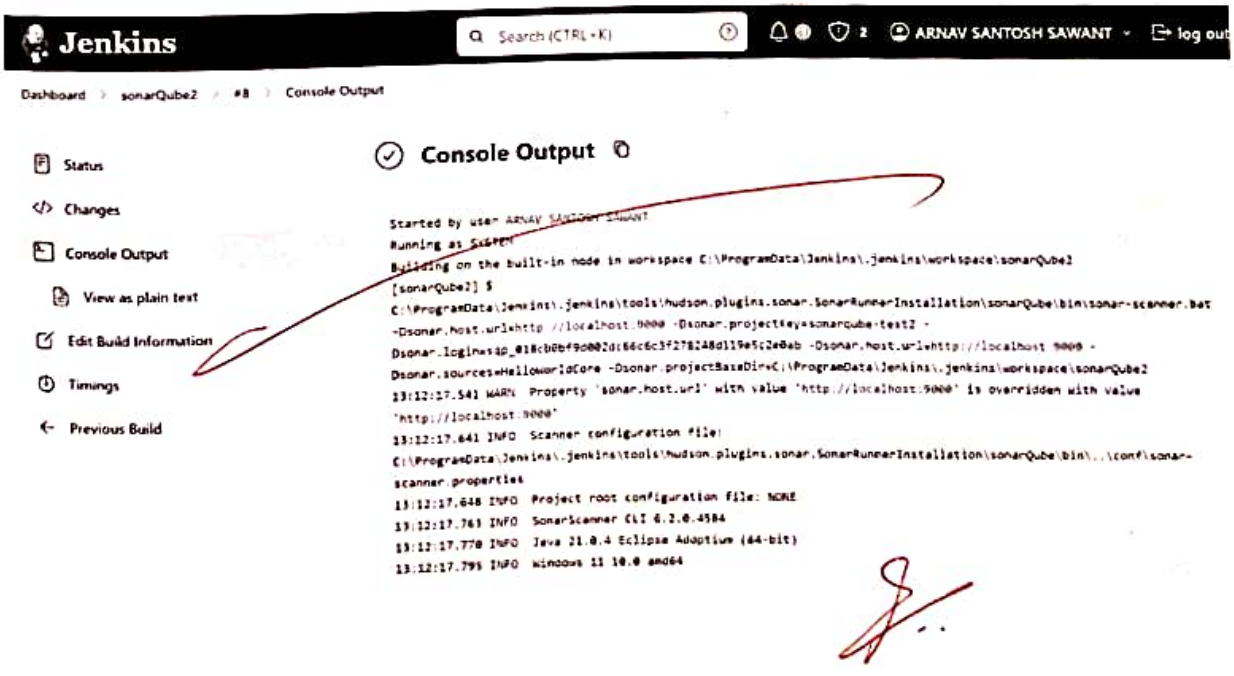
Exp 7 –

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Santosh Sawant> docker run          sonarqube    SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true    9000:9000 sonarqube:latest
docker: error during connect: Head "http://%2F%2F.%2Fpipe%2FdockerDesktopLinuxEngine/_ping": open // /pipe/dockerDesktopLinuxEngine:
The system cannot find the file specified.
See 'docker run --help'.
PS C:\Users\Santosh Sawant> docker run          sonarqube    SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true    9000:9000 sonarqube:latest
docker: Error response from daemon: Conflict. The container name "/sonarqube" is already in use by container "4f18dd2a380b6123c23b375
b26ff242670188ab50f190e8f86ac0889441a113a". You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.
PS C:\Users\Santosh Sawant> docker rm 4f18dd2a380b6123c23b375b26ff242670188ab50f190e8f86ac0889441a113a
4f18dd2a380b6123c23b375b26ff242670188ab50f190e8f86ac0889441a113a
PS C:\Users\Santosh Sawant> docker run          sonarqube    SONAR_ES_BOOTSTRAP_CHECKS_DISABLE=true    9000:9000 sonarqube:latest
c03b891be990f1eb8b41085ce2b42c481c2751f4e9bd6b14a147dd9bfe67fc6a
```





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Advance DevOps Lab

Experiment No.	08
Experiment Title.	Create a Jenkins CICD Pipeline with SonarQube / GitLab Integration to perform a static analysis of the code to detect bugs, code smells, and security vulnerabilities on a sample Web / Java / Python application.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO4:To identify and remediate application vulnerabilities earlier and help integrate security in the development process using SAST Techniques.
Signature:	
Grade:	A1

~ Arnav . S. Sawant
D15A ; Roll-no:- 53

Advance DevOps - Experiment No. 8

Aim:- Create a Jenkins CI-CD pipeline with SonarQube/GitLab Integration to perform a static analysis of the code to detect bugs, code smells, and security vulnerabilities on a sample web/Java/Python App^n.

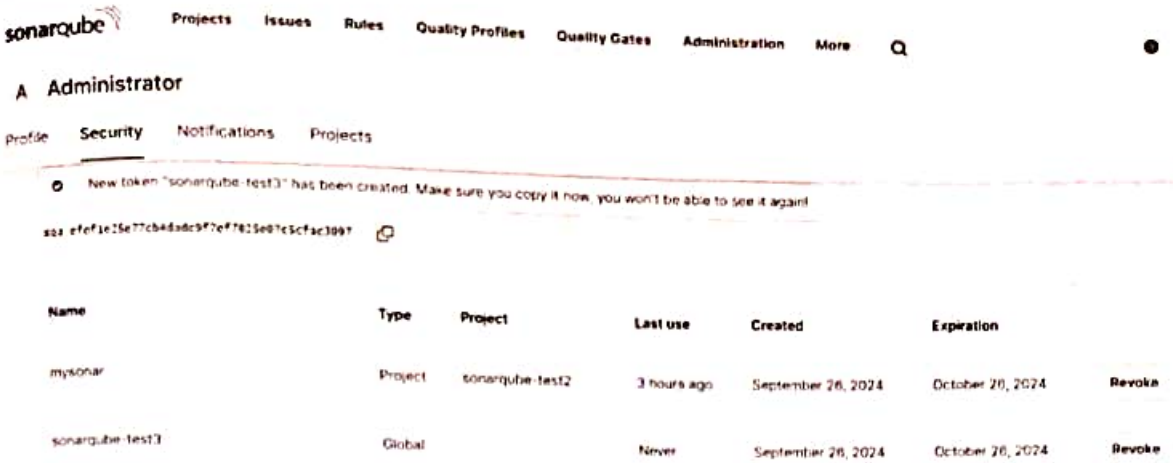
Theory:- A pipeline is a concept that introduces a series of events or tasks that are connected in a sequence to make quick software releases. For eg, there is a task, that task has got five different stages, and each stage has got some steps. All the steps in phase one have to be completed, to mark the latter stage to be complete.

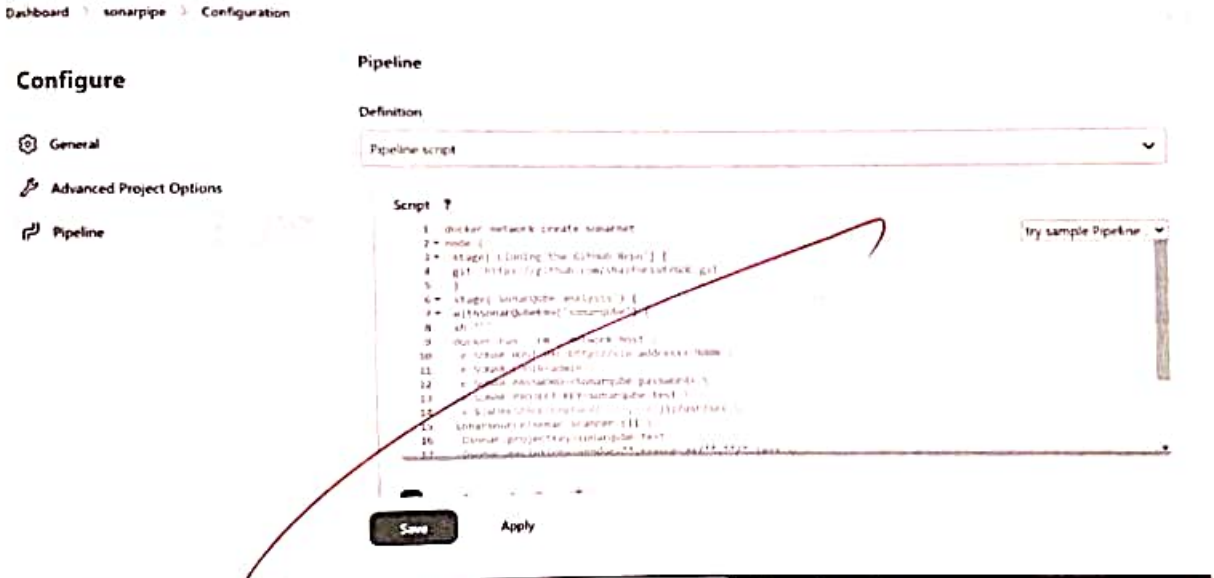
SonarQube is an open-source platform developed by SonarSource for continuous inspection of code quality. Sonar does static code analysis, which provides a detailed report of bugs, code smells, vulnerabilities, code duplications.

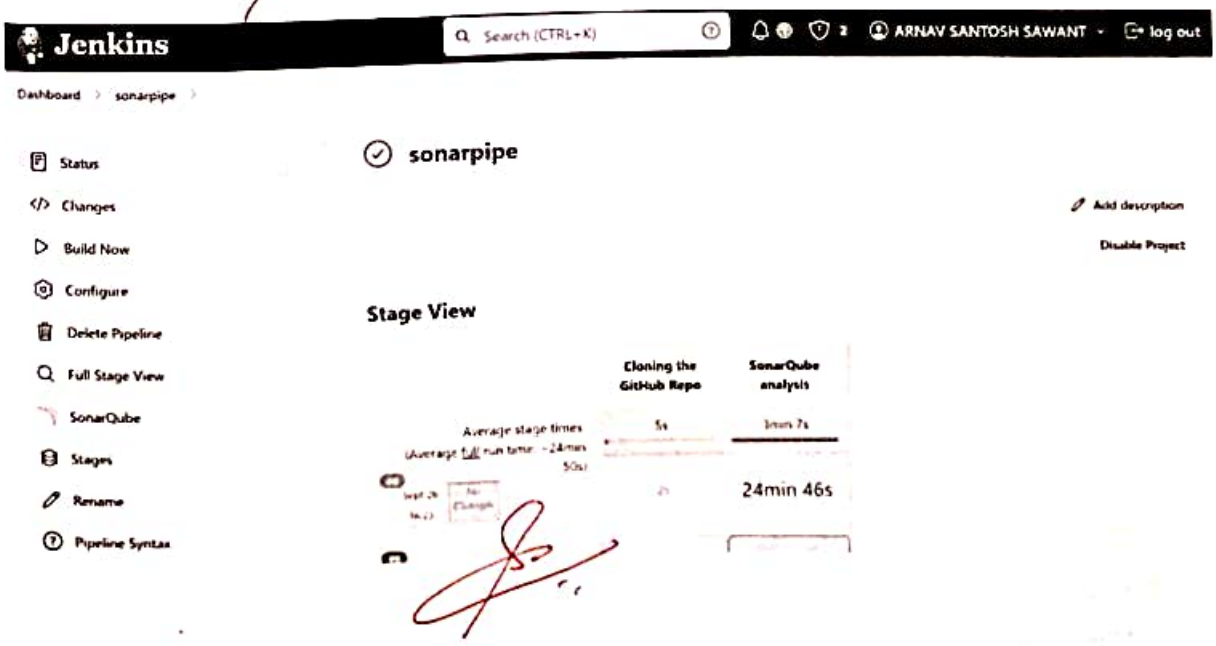
Code smells → It refers to patterns in code that indicate poor design that can lead to issues like increased complexity, decreased maintainability, and bugs in long run.

Conclusion:- 1) I was not getting what to write in pipeline script, so i refered chatgpt for that. "withSonarQubeEnv"
2) In the code, it was giving me errors because in the i wrote wrong sonarqube name (not the one i downloaded).
3) Also the bat command, sonar.login, sonar.password was wrong so i changed it.
4) Also i was not knowing that it is necessary to give required global permissions.

Exp 8 –


sonarqube
Projects
Issues
Rules
Quality Profiles
Quality Gates
Administration
More
A Administrator
Profile
Security
Notifications
Projects
New token "sonarqube-test3" has been created. Make sure you copy it now, you won't be able to see it again!
Name
Type
Project
Last use
Created
Expiration
mysonar
Project
sonarqube-test2
3 hours ago
September 26, 2024
October 26, 2024
Revoke
sonarqube-test3
Global
Never
September 26, 2024
October 26, 2024
Revoke
Enter a new password
All fields marked with * are required


Dashboard
sonarpipe
Configuration
Configure
General
Advanced Project Options
Pipeline
Pipeline
Definition
Pipeline script
Script
Try sample Pipeline
Save
Apply


Jenkins
Search (CTRL+K)
ARNAV SANTOSH SAWANT
log out
Dashboard
sonarpipe
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
SonarQube
Stages
Rename
Pipeline Syntax
sonarpipe
Add description
Disable Project
Stage View
Cloning the GitHub Repo
SonarQube analysis
Average stage times
5s
1min 7s
24min 46s

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A.Y. 24-25

Advance DevOps Lab

Experiment No.	09
Experiment Title.	To Understand Continuous monitoring and Installation and configuration of Nagios Core, Nagios Plugins and NRPE (Nagios Remote Plugin Executor) on Linux Machine.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO5:To use Continuous Monitoring Tools to resolve any system errors (low memory, unreachable server etc.) before they have any negative impact on the business productivity.
Signature:	
Grade:	AP

~ Arnav . S. Sawant
D15A Roll-no :- 53 ①

Advance-DevOps-Experiment-9 (A+) 28

Aim :- To understand continuous monitoring and installation and configuration of Nagios Core, Nagios Plugins and NRPE (Nagios Remote Plugin Executor) on Linux Machine.

Theory :- Nagios is an open-source software for continuous monitoring of systems, networks, and infrastructure. It runs plugins stored on a server that is connected with a host or another server on your network or the network or the Internet. In case of any failure, Nagios alerts about the issues so that the technical team can perform the recovery process immediately.

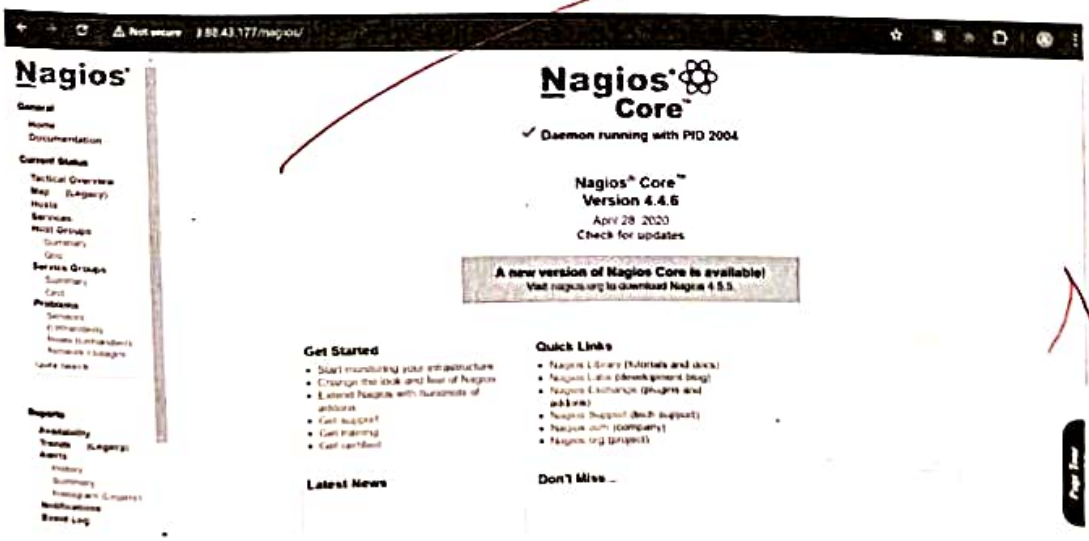
Nagios is used for continuous monitoring of systems, applications, service and business processes in a DevOps culture.

The main reason to use Nagios is to detects all types of network or server issues, helps to you to find the root cause of the problem which allows you to get the permanent solution to the problem.

Conclusion :- 1) Due to some issues was i was not able to execute some commands, due to root functionality.

a) Ensure proper details are being filled in nano files as well as proper commands being executed.

Experiment 9 –



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Advance DevOps Lab

Experiment No.	10
Experiment Title.	To perform Port, Service monitoring, Windows/Linux server monitoring using Nagios.
Roll No.	53
Name	Aman S. Sawant
Class	D20 B
Subject	Advance DevOps
-Lab Outcome	LO5:To use Continuous Monitoring Tools to resolve any system errors (low memory, unreachable server etc.) before they have any negative impact on the business productivity.
Signature:	
Grade:	AA

~ Arnav . S. Sawant
D15A Roll-no :- 5

Advance - DevOps - Experiment - 10

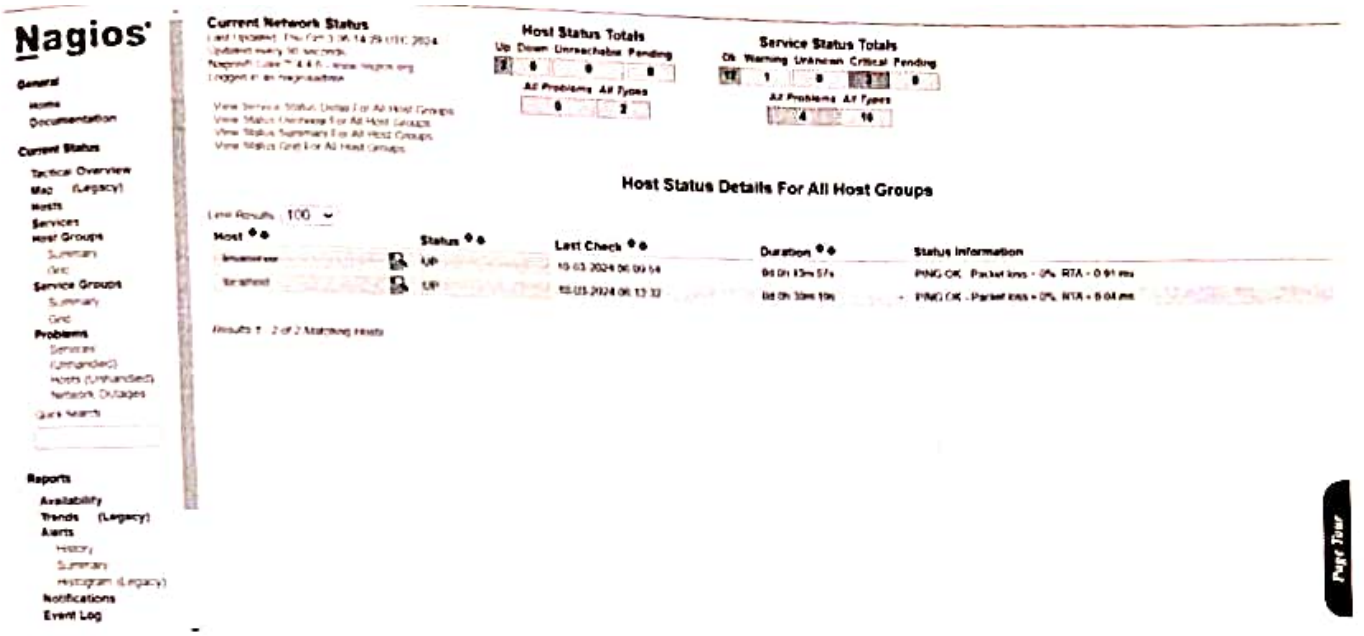
Aim :- To perform Port, service monitoring, Window/Linux Server monitoring using Nagios.

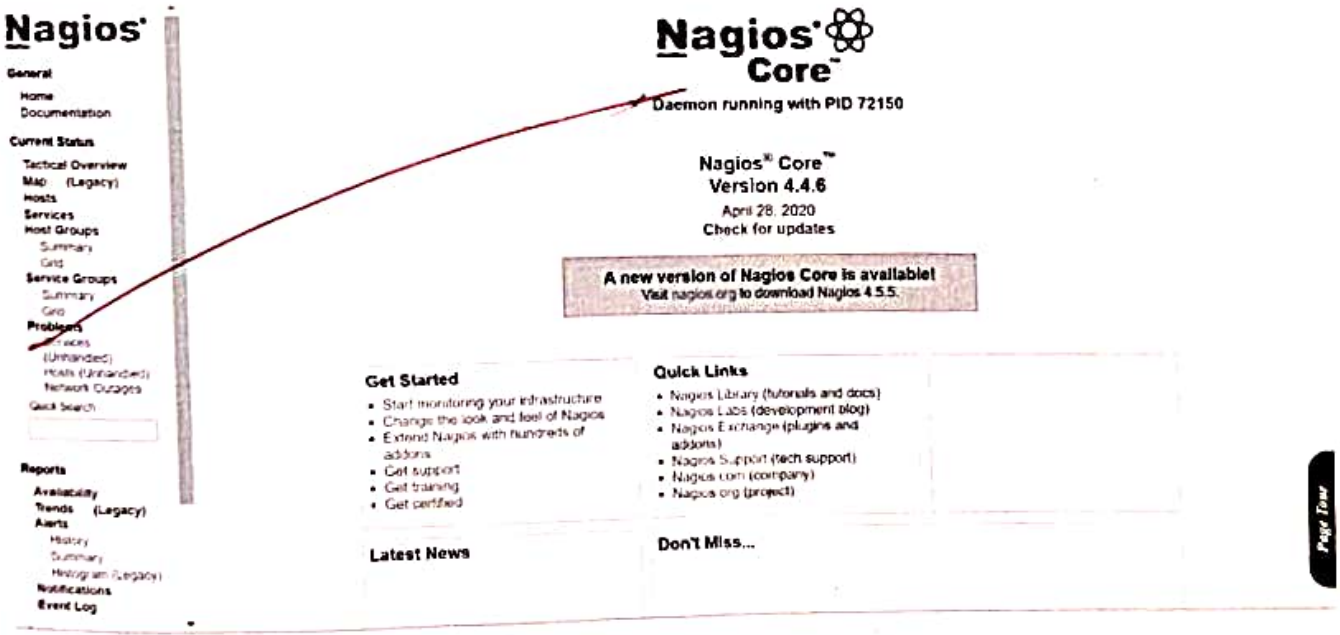
Theory :- Nagios is a comprehensive monitoring and alerting platform designed to keep track of IT infrastructure, network and applications. It provides real-time monitoring, alerting and reporting capabilities to ensure the health and performance of critical systems. Monitoring Capabilities

1. Port monitoring :- Nagios can monitor specific network ports to ensure they are open and responsive. This is crucial as services that rely on these ports. various
2. Service Monitoring :- Nagios checks the status of services to ensure they are running smoothly.
3. Server Monitoring :- Nagios can monitor both windows and Linux servers using agents like NSClient for window and NRPE for Linux. This includes metrics like CPU usage, memory usage, disk space and more.

Conclusion :- i) It was really important to continue with the process, as once you stop instance, the IP address changes, and the nagios server doesn't run again on it.

ii) It was important to have root functionalities otherwise, you wont get the permission to use that command & execute it.


Nagios
General
Home
Documentation
Current Status
Tactical Overview
Map (Legacy)
Hosts
Services
Host Groups
Summary
Grid
Service Groups
Summary
Grid
Problems
Services
(Unhandled)
Hosts (Unhandled)
Network Outages
Quick Search
Reports
Availability
Trends (Legacy)
Alerts
History
Summary
Histogram (Legacy)
Notifications
Event Log
Current Network Status
Host Status Totals
Up Down Unreachable Pending
Service Status Totals
Ok Warning Unknown Critical Pending
All Problems All Types
Host Status Details For All Host Groups
Host
Status
Last Check
Duration
Status Information
UP
UP
Page Tour


Nagios
General
Home
Documentation
Current Status
Tactical Overview
Map (Legacy)
Hosts
Services
Host Groups
Summary
Grid
Service Groups
Summary
Grid
Problems
Services
(Unhandled)
Hosts (Unhandled)
Network Outages
Quick Search
Reports
Availability
Trends (Legacy)
Alerts
History
Summary
Histogram (Legacy)
Notifications
Event Log
Nagios Core
Daemon running with PID 72150
Nagios® Core™
Version 4.4.6
April 28, 2020
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A new version of Nagios Core is available!
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Advance DevOps Lab

Experiment No.	11
Experiment Title.	To understand AWS Lambda, its workflow, various functions and create your first Lambda functions using Python / Java / Nodejs.
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO6: To engineer a composition of nano services using AWS Lambda and Step Functions with the Serverless Framework.
Signature:	
Grade:	AP

~ Arnav S. Sawant
D15A Roll-no:- 53

Advance - DevOps - Experiment - 11

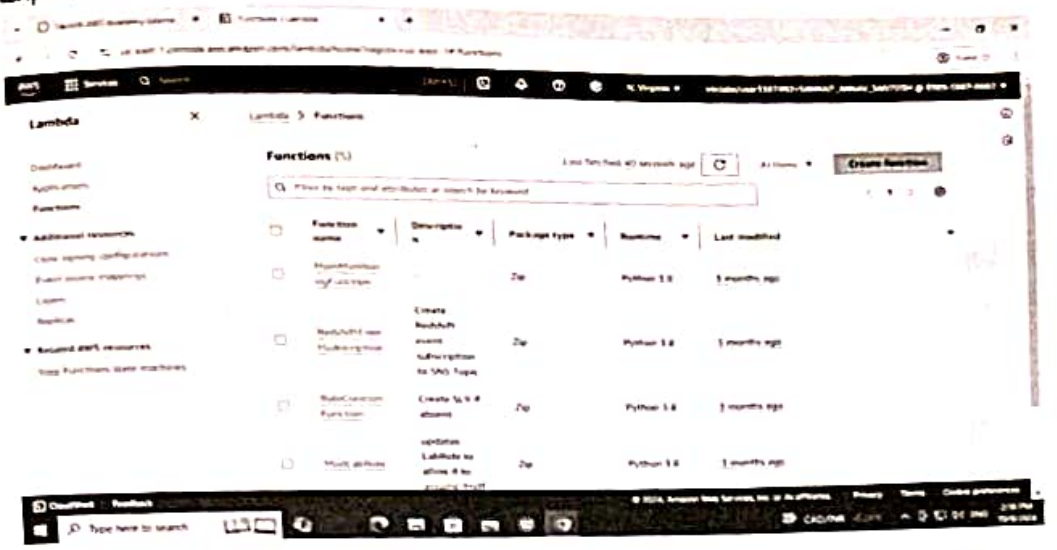
Aim:- To understand AWS lambda its workflow, various functions & create your first lambda functions using Python / Java / Nodejs.

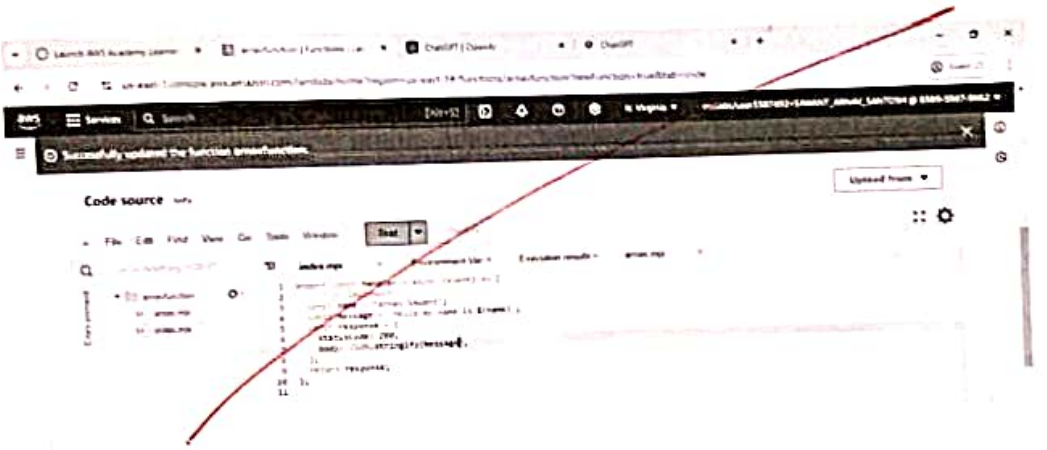
Theory:-

- AWS Lambda is a serverless compute service that allows you to run code in response to events without provisioning or managing servers.
- The workflow begins by creating a Lambda fn, where you upload your code & configure settings like memory and execution time.
- When an event triggers the function, AWS Lambda allocates resources & executes the code in a managed environment.
- This approach enables automatic scaling and built-in fault tolerance across multiple Availability zones.

Conclusion:- 1) I was trying to test that code without deploying so i changed that.
2) I tried deploying a different code, so while testing it gave me error.
3) I learnt which proper code to actually deploy & test.

Experiment 11 -





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Advance DevOps Lab

Experiment No.	12
Experiment Title.	To create a Lambda function which will log "An Image has been added" once you add an object to a specific bucket in S3
Roll No.	53
Name	Arnav S. Sawant
Class	D15 A
Subject	Advance DevOps
Lab Outcome	LO6: To engineer a composition of nano services using AWS Lambda and Step Functions with the Serverless Framework.
Signature:	
Grade:	AA

~Arnav S. Sawant
D15A Roll-no:- 53

Advance-DevOps-Experiment 12

Aim:- To create a lambda function which will log "An Image has been added" once you add an object to a specific bucket in S3.

Theory:- AWS Lambda is a serverless compute service that enables users to run code in response to events without managing servers.

- For instance, integrating Lambda with Amazon S3 allows you to automatically execute code when an object is added to a specified bucket.
- This is achieved by configuring S3 event notifications to invoke the Lambda function, which can log actions or perform additional processing on the uploaded files.
- This serverless architecture enhances scalability and reduces operational overhead.

Conclusion:-

1) At first it was showing me nothing in groups as i havent ~~added~~ added anything in the S3 bucket (uploaded).
2) Lambda functions was studied properly.

Experiment 12 -