DevOps with AWS

1. Introduction to DevOps

□ Key Concepts

- What is DevOps?
- Stakeholders in DevOps
- Software Development Life Cycle (SDLC)
  - Phases of SDLC
  - Role of Dev & Ops in SDLC

- SDLC Methodologies:
  - Waterfall vs. Agile & Scrum
  - Agile Manifesto & Workflow

- DevOps Lifecycle & Tools

□ Labs

1. Analyze SDLC phases for a sample project.

2. Linux Fundamentals

□ Key Concepts

- Linux vs. Windows
- Linux Architecture & Flavors
- File System Management
- User/Group Management
- Shell Scripting:
  - Variables, Loops, Functions
  - Command-line Arguments

□ Labs

1. Practice Linux commands (e.g., file editing, permissions).
2. Write a shell script for automated backups.

3. Version Control with Git

□ Key Concepts

- Git vs. Other VCS Tools
- Git Workflow:
  - Staging, Committing, Branching
  - Merging, Rebasing, Pull Requests

- GitHub Account Setup

Labs

1. Clone a repository, create branches, and resolve conflicts.

4. Build Automation with Maven

Key Concepts

- Maven Lifecycle & Dependencies
- Local/Central/Remote Repositories
- Archetypes & Goals

Labs

1. Create a Maven project and automate builds.

5. CI/CD with Jenkins

Key Concepts

- Jenkins Master-Slave Architecture
- Pipeline Creation (Multi-stage)
- Integrations:
  - Maven, Git, SonarQube, Docker, Kubernetes

Labs

1. Set up a Jenkins pipeline for a Java app.
2. Integrate Jenkins with Docker for deployments.

6. Configuration Management with Ansible

Key Concepts

- Playbooks & YAML Syntax
- Roles, Handlers, Tags
- Ansible Galaxy & Tower

Labs

1. Write a playbook to configure web servers.

7. Containerization with Docker

🔹 Key Concepts

- Docker Architecture & Lifecycle
- Dockerfile, Networks, Volumes
- Docker Compose & Swarm

🔹 Labs

1. Containerize a Spring Boot app.
2. Deploy a multi-container app using Docker Compose.

8. Orchestration with Kubernetes

🔹 Key Concepts

- Pods, Services, Deployments
- ConfigMaps, Secrets, Ingress
- Helm Charts & Monitoring (Grafana, Prometheus)

🔹 Labs

1. Deploy a microservices app on Kubernetes.

9. Infrastructure as Code (Terraform)

Key Concepts

- Terraform vs. Ansible
- Scripting AWS Infrastructure (EC2, VPC, S3)

Labs

1. Provision AWS resources using Terraform.

10. AWS Core Services

Key Concepts

- **Compute:** EC2, Auto Scaling, Load Balancing
- **Storage:** S3, EBS, EFS
- **Networking:** VPC, Route 53
- **Security:** IAM, Security Groups
- **Databases:** RDS, DynamoDB

- **Serverless:** Lambda, API Gateway

☐ Labs

1. Host a static website on S3.
2. Configure a VPC with public/private subnets.

11. Advanced AWS Tools

☐ Key Concepts

- **Monitoring:** CloudWatch
- **Messaging:** SQS, SNS
- **PaaS:** Elastic Beanstalk
- **IaC:** CloudFormation

☐ Labs

1. Set up alarms in CloudWatch.
2. Deploy an app using Elastic Beanstalk.

12. Certification & Interview Prep

Topics Covered

- Resume Building Tips
- AWS Certification Roadmap
- Frequently Asked Interview Questions

Tools & Technologies Covered

- **Containers:** Docker, Kubernetes
- **CI/CD:** Jenkins, Git, Maven
- **Cloud:** AWS (EC2, S3, VPC, Lambda)
- **IaC:** Terraform, CloudFormation
- **Monitoring:** Grafana, Prometheus