SAIDEMY

DevOps

DevOps

- Definition of SDLC
- Purpose of SDLC
- General Phases of SDLC
- Various Models of SDLC
- About Waterfall SDLC Model
- Waterfall SDLC Model - Advantages
- Waterfall SDLC Model - Disadvantages
- About Agile SDLC Model
- Agile SDLC Model - Advantages
- Introduction to DevOps
- History of DevOps
- What is DevOps
- Definition of DevOps
- Fundamental Principles of DevOps
- Benefits of DevOps
- After Implementation
- DevOps Roles and Responsibilities
- Continuous Integration in DevOps

AWS Cloud

- What is Cloud Computing
- What is AWS Cloud
- How AWS Cloud is being operated
- Cloud Advantages
- AWS Account Creation
- Free Tier AWS
- AWS Regions
- AWS Availability Zones
- AWS Services
- AWS Console Overview

EC2

- Introduction to EC2
- EC2 Dashboard Overview
- What is Elastic
- How scaling works
- Types of Operating Systems
- Windows and its versions
- Unix and its flavors
- Linux and its flavors
- About Amazon Machine Images (AMI)
- Different types of AMI's
- How to create AWS AMI
- How to create a Key Pairs
- Instance types
- What is EBS (Elastic Block Store)
- Download a key pair
- Access EC2 Windows instances
- Access EC2 Linux instances
- Putty and PuttyGen
- MobaXterm tool
- Browser Access
- What is pem file
- What is ppk file
- What are default usernames to connect AMI's
- Start/Stop/Reboot the Instance
- Load Balancer
- Auto Scaling
- Protection from Accidental termination
- Recover lost keys
- Linux Web Server
- Windows Web Server
- Security Groups

Unix/Linux

- Introduction to Unix/Linux
- Unix flavors
- Linux Flavors
- Why Linux?
- Advantages of Unix/Linux
- Architecture of Linux
- File system hierarchy
- cat (create & append file)
- touch (create blank file)
- nano (create & edit file)
- vi/vim (create & edit file)
- ls (list) (-a, -la)
- cd (change directory)
- pwd (print working directory)
- mkdir (create directory, multiple)
- cp (copy)
- mv (move)
- mv (rename)
- rm (remove file)
- tree (see in tree structure)
- rm -rf(remove directory & recursive)
- grep (pick & print)
- less (see output)
- head (see top 10 lines)
- tail (see last 10 lines)
- sort (display in Alphabetic/Numeric order)
- User creation
- Group creation
- Soft Link (shortcut)
- Hard Link (backup)
- tar (to pack)
- gz (to compress)
- yum (to install)
- wget (to download)

- File/Directory Permissions:
- chmod (permissions)
- chown (owner)
- chgrp (group)
- hostname (to see hostname)
- ifconfig (to get ip address)
- cat /etc/*rele* (to get os version)
- yum commands
- rpm commands
- service commands
- chkconfig commands
- Redirection (redirecting output)
- which (to see package installed or not)
- sudo (to get root privileges)
- whoami (to see user)
- find commands
- User Management
- Group management
- SSH Connection
- SUDO Permissions
- Password less SSH Connection
- Access Server as normal user
- Managing User permissions
- Generating SSH Keys
- Public vs Private keys

Git

- Source code management
- Version control system/Revision control system
- SCM tools
- Repository/Depot
- Server
- Work space/Work dir/Work tree
- Branch/Trunk/Code line
- Commit/Check-in
- Version/Version-ID/Commit-ID
- Tag
- Advantages of Git
- Git Snapshots
- Work space
- Staging area
- Buffer area
- Repository (Local/non-bare)
- Repository (Central/bare)
- Installation & configuration
- Git add
- Git commit
- Git log
- Git push
- Git status
- Git ignore
- Git branch
- Git checkout
- git merge
- Git Snapshots
- Git conflict
- Git stash
- Git reset
- Git revert
- Repository (Central/bare)
- Git remove
- Git clean
- Git tag
- Git fetch
- Git diff
- Git cherry-pick
- Git hub
- Role of Git in Real Time
- Git installation on Windows and Screen shots
- Git installation on Linux
- Git Architecture
- What is Git Repository
- Git with Local Repositories
- Git with Remote Repositories
- git config command usage
- Setup git repository using git init
- Git Making Changes
- git status color coding system
- Exercises on adding single files, multiple files commits
- Committing Changes in one go
- Git History - log and show
- View all commit logs
- View only latest commit logs
- git show command
- Comparing git project files from working area with Local Repo using git diff
- Git diff –staged
- git remote commands

GitHub

- Introduction to GitHub Repository
- Push changes to GitHub Repository
- Create Account in GitHub
- Create Project Repository in GitHub
- Public Repository
- Private Repository
- Create files in GitHub
- GitHub branches
- Pull Request
- Tokens
- SSH Keys
- Committing changes
- Forking GitHub repositories
- Clone GitHub Repository
- Pull changes from GitHub
- Push changes to GitHub Repository
- Managing GitHub repos
- Integration with Jenkins
- Integration with Ansible
- Integration with Docker
- Integration with Kubernetes
- Integration with Terraform

Docker

- What is Container
- Docker features
- Docker history
- Docker usage
- Docker Architecture
- Docker Editions
- Docker system Requirements
- Docker installation and setup
- How to verify docker installation
- About Docker version
- OS-Level-Virtualization
- Layered file system
- VM Ware vs Docker
- Docker components
- Docker workflow
- Docker benefits
- Docker images
- Docker Container
- Docker file
- Docker hub/registry
- Docker daemon
- Docker Install & Configure
- Docker all commands
- Docker Volumes
- Volume (container-container)
- Volume (Host- Container)
- Port mapping
- Registry server
- Pull/push images from /to registry
- CMD
- RUN
- ENTRYPOINT
- Relation between container and docker
- Why docker is so popular
- Difference b/w container and image

- Containers History
- How to see list images in docker
- What is Docker Registry
- How to see all docker images
- How to pull images from docker registries
- What is pulling in docker?
- Difference between Docker Pull, run, Push
- How to run docker image
- How to exit from container without killing it
- How to exit from container by killing it
- How to see all running container on docker host
- How to check the history of all containers
- How to stop a container that is running
- How to find latest containers that are created
- How to get inside of already a running container
- How to start a container and remove it once task is completed
- How to delete or remove a container
- How to delete or remove image from docker host
- How to attach a port of docker host to docker container
- How to run a container in background
- Difference between docker container run and docker container start
- How to specify a name to docker container
- How to see container logs
- How to see all commands related to a container
- How to remove docker multiple containers
- How to check docker container metadata using docker inspect
- How to list what ports are being used by docker container
- How to tag docker images
- How to log into docker registries using docker CLI
- How to logout from docker registries using docker CLI
- How to push docker image to docker registries
- About Docker file
- How to create Dockerfile to build an image
- How to build an image from Dockerfile
- About Dockerfile Instructions
- Docker Compose
- How to write Docker Compose files
- Services in Docker Compose
- Scaling in Docker Compose
- Managing containers with Docker Compose
- Docker Swarm
- How to write Docker Swarm files
- Services in Docker Swarm
- Managing Manager and Nodes with
- Docker Swarm
- Scaling in Docker Compose
- Managing containers with Docker Swarm
- Stacks, Services, and Tasks in Docker Compose
- Replicated and Global modes in Docker Swarm

- Declarative and imperative ways of using Docker Swarm
- Playing with Manager and Nodes statuses in Docker Swarm

Ansible

- Configuration Management tool
- Introduction To Ansible
- History
- Advantages of CM tool
- Why Ansible
- Ansible Advantages
- Ansible Architecture setup
- Install & configure Ansible
- Features Of Ansible
- Use Cases Of Ansible
- What Can Do In Production Environment
- Ansible Documentation
- How Ansible Is Different from Configuration Management Tools
- Ansible Architecture
- Ansible Control Machine Requirements
- Ansible Installation Process
- Ansible Terminologies
- How Ansible Works
- Ansible Lab-setup
- Ansible Inventory
- Test Environment setup
- Host Patterns
- Ad-Hoc commands
- Modules
- Gathering facts
- Playbooks
- YAML Language
- Target section
- Variable section
- Task section
- Handle section
- Dry run
- Loops

- Conditionals
- Vault
- Representation Of Dictionary In Yaml
- Representation Of List In Yaml
- Group Inventory File
- Ansible Inventory Parameters
- Ansible Exercise - To Setup Inventory File And Perform Ping Test
- Ansible Playbooks and Modules
- Ansible Playbooks
- Sample Ansible Playbook
- Ansible Playbook Format
- Ansible Modules
- Ansible Tasks
- File management Playbook
- Directory management Playbook
- User management Playbook
- Group management Playbook
- Package management Playbook
- Services management Playbook
- Web Server Playbook
- Conditionals Playbook
- Tags
- With Items
- Shell Commands
- Error Handling
- How To Run A Playbooks
- How to check the syntax of a Playbook
- How to Run a playbook on multiple hosts
- How to Run a playbook on target hosts
- Ansible Run Command Methods
- Ansible custom host file
- Install Tomcat
- Install Jenkins
- Ansible Roles

Kubernetes

- What is kubernetes
- Features of kubernetes
- Architecture of kubernetes
- Kubernetes Master
- Kubernetes nodes
- Kubernetes components
- Kube-api server
- etcd (cluster store)
- Kube-scheduler
- Node
- Kube-proxy
- Kubelet
- Installation of Kubernetes
- Kubernetes Objects
- Kubernetes Spec
- Kubernetes Status
- K8S Object Management models (Imperative and Declarative)
- Pod Fundamentals
- Everything about Pod
- K8S Installation and Configuration models (All 3 types)
- Kubernetes YAML scripting rules
- Setting up a single-node K8S cluster with minikube
- Installation of kubectl
- Service discovery
- Kubernetes restart policy
- Managing Pods and containers
- Kubernetes pods logs
- Executing commands in containers
- Managing multi container pods
- Pod Environment Variables
- Labels & Selectors

- Selectors (Set-based)
- Kubernetes Node Selectors
- Kubernetes Scaling
- Kubernetes Replication
- Kubernetes Replication Controller
- Kubernetes Replica Set
- Selectors (Equality-based)
- Kubernetes Deployments
- Rolling Update
- Rollback/Rollout
- Kubernetes Networking
- Kubernetes Services
- Communication among containers
- in same pod
- Pod to Pod communication
- Cluster IP (Virtual IP)
- Node Ports (30000-32767)
- Node IP
- Node to Pod communication
- Deploying applications in Pod's containers
- Kubernetes Volumes
- emptyDir
- hostPath
- Persistent Volumes
- Persistent Volume Claim
- Deployment Persistent Volume
- AWS Elastic Block Store
- Health Checks
- Liveness Probe
- Readiness check
- Kubernetes Namespace
- Secrets
- ConfigMap
- Secrets from a text file
- Secrets from a Yaml file
- Secrets as environment variables
- Secrets as volumes in the pod
- ConfigMap from a text file
- ConfigMap from a Yaml file
- ConfigMap as environment variables
- ConfigMap as volumes in the pod
- Managing Computer Resources for Containers
- CPU Limits
- Memory (RAM) Limits
- Resource Quotas
- Setting Limit for Name Space
- Kubernetes Jobs
- Parallism
- Cron Job
- Init Containers
- Logging
- Pod Life Cycle
- Pod Conditions
- Container States
- EKS Cluster
  (Elastic Kubernetes Service)

Cloud Watch

- What is Cloud Watch
- Why to monitor
- What is default monitoring
- What is detailed monitoring
- Time interval
- Increasing Load on Server
- Creating Alarms
- Creating Graphs
- Line
- Stacked
- Number
- Text
- Create Billing Alarm
- Monitor Billing
- Deleting Billing Alarm
- Why only cloud watch
- How to see metrics
- Custom metrics
- CPU% Monitoring
- RAM% Monitoring
- Connecting EC2 with Cloud Watch with IAM Role

IAM (Identity and Access Management)

- What is Cloud Watch
- What is IAM
- How to create Users
- How to assign limited permissions
- Provide login access
- Graphical access
- Command line/Programmatic access
- IAM Roles
- Username & Passwords
- Access & Secret keys
- Recover lost credentials
- Recover lost .PEM keys
- IAM user administration

Maven

- What is Build
- Purpose of Build Tools
- Build Tools Ideology
- Evolution of Build Tools
- Few Notable Build Tools
- Java Based Build Tools
- Build management
- Advantages of Build tool
- Architecture of Maven
- Maven build life-cycle
- Maven repositories
- Pom.xml
- Multi module project (over view)
- Maven directory structure
- Maven link to GitHub
- Maven link to Jenkins
- How Developers use maven
- List of Maven Templates

Terraform

- What is terraform
- What are the advantages of terraform
- why we have to use terraform
- What is IAC?
- What are the advantages of IAC?
- list of cloud providers
- What are the cloud providers support terraform
- How to download terraform software
- Terraform installation on windows & Linux Servers
- how to set terraform path temporarily and permanently
- Setup Environment Variable
- What is IAM in AWS?
- How to create IAM user?
- How to launch windows instance
- How to launch Linux instance
- Creation of S3 bucket
- Launch multiple instances at a time (Windows and Linux)
- Change configuration of EC2 Instances with Terraform Script
- Create and attach our own Security groups to Instances
- Convert Linux instance into Web Server with Terraform Script
- Launch multiple instances by giving different names
- Create VPC with Subnets, Internet Gateways, Route Tables and connecting all of them with Terraform Script
- Create RDS (MySQL) database in AWS with Terraform Script
- Terraform Output block
- VS Code Setup
- Count.index
- State Management (terraform.tfstate)
- Variables
    a. variables.tf
    b. terraform.tfvars
    c. *.auto.tfvars
    d. -var-file Command-Line Argument
    e. Command-Line Argument
    f. Environment Variable
    g. Interactive Input
- Data Source
- Operators
- Expressions
- Object
- Loops
- Functions
- Multiple Resources
    a. Count
    b. for_each
- Modules
- Registry
- Resource Dependency
    a. Implicit
    b. Explicit
- Resource Lifecycle
    a. create_before_destroy
    b. prevent_destroy
    c. ignore_changes
- Validations
- State Manipulation
- Import
- Workspaces
- Terraform Cloud
- Real Time Work

Jenkins

- Introduction to Jenkins
- Why Jenkins
- Relation between Jenkins and Hudson
- History of Jenkins
- Why Jenkins is so popular
- Features of Jenkins
- Jenkins Architecture
- Jenkins Prerequisites
- Continues Integration(CI)
- Jenkins workflow
- Ways of CI
- Benefits of CI
- Why only Jenkins
- Git for Windows
- Java installation & configuration
- Maven installation & Configuration
- Jenkins installation & configuration
- Free style project
- Maven project by maven
- Maven project by Jenkins
- Jenkins Plugins
- Scheduled Projects
- Source code polling (Git)
- Related/Linked projects
- Upstream & Downstream projects
- CI-CD pipeline
- Jenkins Views
- User management
- Jenkins Slaves
- Tomcat web server
- Minimum Hardware Requirements
- Recommended Hardware Requirements
- Jenkins Dashboard Overview
- Job or Project
- Executor
- Build
- Plugin
- Setup Environment Variables
- Jenkins Terminologies
- Master
- Slave or Node
- Job Listing Section
- Setup Jenkins Server
- Jenkins Menu Section
- Jenkins Menu- Item
- Jenkins Menu-People
- Jenkins Menu-Build History
- Jenkins Menu-Manage Jenkins
- Jenkins Menu-views
- Build Queue Section
- Build Executor status Section
- Jenkins - Creating Jobs in Jenkins
- Naming a Project
- About Project Descriptions
- How to disable the build systems
- Source Code Management
- Build Triggers
- Create a Sample Project
- Understand Jenkins Job Process
- How to check Build Information
- Jenkins Build Color Code system
- Configure Jenkins Build Server
- Configure Java JDK for Jenkins Build Server
- Configure Apache Maven for Jenkins Build Server
- Configure the JAVA JDK for Build jobs in Jenkins
- Configure the Maven for Build Jobs in Jenkins

- Configure GitHub for Build Jobs in Jenkins
- Configure SCM-Git Plugin for Build Jobs in Jenkins
- Secure Jenkins
- Manage Jenkins Plugins
- Install Plugins
- Upgrade Plugins
- Backup plugins
- Jenkins User administration
- Create Jenkins User Accounts
- Delete Jenkins User Accounts
- How to change the Jenkins Admin Password
- Change Home Directory
- Configure - Executors, Labels, SCM Checkout Retry Count
- Build Triggers
- Configure Poll Source Code management in Jenkins
- Configure Poll SCM Changes using Crontab in Jenkins
- Trigger Builds Remotely using URL
- Trigger Builds based on build Pipeline or other Projects
- Build triggers Periodically
- Build triggers when changes pushed to GitHub or SCM
- Architecture of Distributed Build
- Configure Jenkins Master Server
- Configure Jenkins Slave Server
- Configure authentication between Jenkins master and Slave Server
- Setup Relationship between Master and Slave
- Configure Project to build on Jenkins slave server
- Email Notifications in Jenkins
- Purpose of Email Notification
- Email Notification plugins
- CI-CD Pipeline Project
- Jenkins Pipelines
- Types of pipelines
- Advantages of Pipeline Script
- Jenkins Pipelines Script

Tomcat (Application Server)

- Installation
- Configuration
- Tomcat manager
- Application management
- App deployment methods
- Accessing from other machines
- User creation
- Services management
- Trouble Shooting
- Creating tomcat docker image
- Changing tomcat default port
- CI-CD Deployment in Tomcat

SNS

- SNS (Simple Notification Service)
- What is SNS?
- Need of notifications
- Formats of SNS
- Topics in SNS
- Subscribers in SNS
- Subscription in SNS
- SNS integration with Cloud Watch
- How to clean up SNS

SonarQube

- What is SonarQube?
- What is Quality Checking?
- How does SonarQube work?
- Why do we need SonarQube?
- Advantages of SonarQube
- Static code Analysis
- Creation of SonarQube account
- SonarQube account over view
- Generate Authentication token
- Integration with Jenkins
- SonarQube plugins
- SonarQube cloud account
- Creation of Organization
- Creation of Project
- SonarQube Server
- Configuration of SonarQube server
- SonarQube scanner
- Properties file of SonarQube
- How to create Properties file
- Integration with GitHub
- Quality Gates in SonarQube
- Bugs report
- Code smells report
- Analyzing SonarQube results

JFrog Artifactory

- What is JFrog Artifactory?
- What is the purpose of any Artifactory?
- Why do we need JFrog?
- Advantages of JFrog
- JFrog account creation
- What is JFrog cloud account?
- JFrog user management
- Managing user privileges
- Generation of Tokens
- JFrog Integration with Jenkins
- JFrog plugins
- Storing Jar files in JFrog
- List of JFrog repositories
- Storing Docker Images

Helm

- What is Helm?
- What are Helm charts?
- Why do we need Helm?
- Advantages of Helm charts?
- Helm relation with Kubernetes
- Helm Integration with Kubernetes
- Jenkins integration with Helm
- Installation of Helm
- Helm repositories
- Helm search
- How to pull Helm packages
- Helm Templates
- ClusterIP in Helm
- NodePort in Helm
- Install/Uninstall helm repositories
- Helm deployments
- Integration with Prometheus
- Integration with Grafana

Web Servers

- HTTPD
- Apache2
- IIS (Internet Information Services)
- Installation
- Types of web packages
- Configuration
- Directory Structure
- Index file
- Starting service
- Enabling Service

Prometheus

- What is Prometheus?
- What is Monitoring?
- What is Alerting?
- PromQL language in Prometheus
- Metrics in Prometheus
- Service Discovery
- Third Party components
- Exporters in Prometheus
- Ports of Prometheus
- Architecture of Prometheus
- Alert Manger
- TSBD in Prometheus
- Retrieval in Prometheus
- HTTP Server
- Jobs in Prometheus
- Integration with Help
- Integration with Grafana
- Prometheus Dashboard
- Prometheus Helm charts
- Integration with Kubernetes

ChatGPT

- ChatGPT will enhance every DevOps tool with AI capabilities. As DevOps tools become AI-powered, AI will be integrated into every stage of the DevOps lifecycle.

Grafana

- What is Grafana?
- Why do we need Grafana?
- Advantages of Grafana?
- Grafana Queries
- Grafana Visualizations
- Grafana Alerts
- Grafana Dashboards
- How to analyze metrics
- Integration with Prometheus
- Grafana account
- Access to Grafana account
- Deep study of Grafana Dashboard
- Grafana Search

DevSecOps

- Security is a crucial aspect at every stage and in every activity of the development process. There can be no compromise on security. Recognizing its importance, the term "Sec" has recently been integrated into DevOps, forming "DevSecOps." This emphasizes the necessity of embedding security into every tool and phase of the DevOps lifecycle. We'll be exploring and discussing the security features within each DevOps tool to ensure robust protection throughout the development pipeline.

Projects

- **DevOps real time projects - 5**
  (CI-CD Pipeline projects)

Additional Support

- **Provides Regular Recorded Class Video**
- **Provides Softcopy Material**
- **Resume preparation explanation for**
  a. **Fresher**
  b. **Experienced**
     i. **IT**
     ii. **Non-IT (even > 10 Years also)**
- **Resume Validation**
- **We will conduct One-to-One Discussion at the end of course to provide guidance**
- **Explanation of**
  a. **Day-to-Day tasks**
  b. **Errors & Troubleshooting**
  c. **Dealing with client calls**
  d. **Real-time scenarios**
  e. **Interview cracking tips**
  f. **Interview & Exam Questions**
  g. **IT Working Environment**
- **Job Assistance will be provided**
- **Doubts clarification in English, Hindi & Telugu**
- **Explanation from "0" level**
- **Any "Edu" Qualification is accepted (Including Non IT)**
- **Provides Course Completion Certificate**

Thank You