Advance of Terraform Program

Duration: **32 Hours**

Pre-requisite:

Good hands-on knowledge of Devops and AWS services Basic Knowledge one below topics

- Terraform
- IAC
- Linux basics
- Ansible basics
- CICD, Jenkins

Course content (4 hours daily - 1 hour for each bullet points):

DAY 1:

- ❖ LAB 1: Terraform components overview and setup
- ❖ LAB 2: Integrating Terraform with the Jenkins pipeline and pushing a dummy project in the pipeline
- ❖ DEMO: Integrating it with GITHUB repo
- ❖ LAB 1: Use Terraform workspaces to manage different environments (e.g. dev, staging, production).

Day 2:

- ❖ How to write Terraform Files for AWS Services
- ❖ How to Keep the Terraform files in version control with branching.
- ❖ LAB 1: Automated Infrastructure (AWS) Setup Using Terraform and Jenkins (Launch EC2 and VPC)
- ❖ DEMO: Use modules & Variables to organize the Terraform script.

Day 3:

- ❖ DEMO: Use Terraforms built-in validation checks, such as terraform validate, to catch errors early
- ❖ DEMO: Use a separate backend configuration to store the state remotely to avoid loss and conflicts.
- ❖ LAB2: Terraform Jenkins CI/CD pipeline development with real world enterprise example
- ❖ DEMO: Using Parameters/Secret Keys, Authentication, Authorization, Roles etc.

DAY 4:

- ❖ Sagemaker Concepts
- ❖ How to Create AWS SageMaker and Pipeline using Console
- ❖ LAB: AWS SageMaker Infrastructure setup using Terraform
- ❖ LAB: Policy as Code using Terraform for Enterprise level Service Control Policy
- ❖ DEMO: Defining IAM policy (roles/Groups) for resource level access restriction.
- ❖ DEMO: How to setup Multi-Account/VPC/Region Terraform setup and reusability for Sagemaker

Day 5:

- Setup Ansible, Ansible Roles, Playbook and Configuration management
- Lab 1: Jenkins Integration with Ansible
- Configuration management for AWS S3 Objects and other AWS Services with Ansible.
- Lab2: Provision an AWS EC2 instance using Ansible and Terminating EC2 Instances

Day 6:

- DEMO: Use terraform plan-detailed-exit code to check for changes before applying.
- DEMO: How to use terraforms state commands to inspect/manage the state of the infrastructure
- DEMO: State Files, Drift Detection, Troubleshooting and CLI commands etc.
- LAB 1: Use the terraform import command to import existing resources, keep track of state.

DAY 7:

- Discussing Terraform Best practices for Enterprise/Production implementation (Do's and Don'ts)
- DEMO: Production and Non-Production setup with end-to-end daily operations using Terraform (25% explanation and 75% hands-on including live demo's if possible).
- LAB 1: Daily Managing (Modify/Delete) Infrastructure using Terraform files for AWS services
  - Multiple VPC networking with security group
  - S3 and S3 Endpoint, Lambda, DynamoDB, etc.
- Troubleshoot issues with Terraform, Jenkins, Ansible and AWS Services with monitoring.

DAY 8:

- LAB: How to write secure Terraform files without using Sentinel (Terraform Enterprise Security)
- LABL Terraform SSO setup collaboration between Teams Deployment
- End to end testing for infrastructure created by Terraform and Logs
- Summary and Recap of all days of learning