# Roadmap for DevOps

## DevOps Intern:

1. Basic concepts of different linux distributions,
    a. Why Linux ? What is Open Source ?
    b. How SSH works
    c. Modifying permissions of folders and file
    d. Usage of VIM/Nano editor
    e. Basic use of Net tools
    f. Utilities
    g. FileSystem
    h. TCP/IP fundamentals
    i. Wild Card usage
    j. Why /etc directory is important ?

2. Difference between Shell and Bash.
3. Bash Scripting.
4. Understanding & usage of following operators,
   |, ||, &, &&, >, >>, <, <<, $, @, *, ~, ` (backtick), ?, \ in the command line.
5. Understanding of different web servers
    a. Nginx
    b. Apache
6. Using web servers as,
    a. Load Balancers
    b. Reverse Proxy
7. Understanding of cloud computing.
    a. IaaS
    b. PaaS
    c. SaaS
    d. FaaS
8. Knowledge of different cloud platforms,
    a. AWS (Preferred)
    b. GCP (Basics)
    c. Azure (Basics)
    d. Digital Ocean (Basics)
9. Knowledge of different AWS services,
    a. EC2
    b. S3 Bucket

    c. IAM roles
    d. Elastic IPs
    e. Security Groups
    f. Codedeploy
10. What is CI/CD?
11. Basic understanding of different CI/CD platforms,
    a. Github Actions
    b. Jenkins
12. Basic understanding of git.
13. Basic understanding of web protocols.
    a. SSH v/s Telnet
    b. FTP v/s SFTP
    c. HTTPS v/s HTTP
    d. DNS records
    e. HTTP2
    f. IPV4 v/s IPV6
14. Basic knowledge of setting up an environment for wordpress websites.

**Time period: Best = 6 weeks, Good = 7 weeks, Average = more than 9 weeks**

## DevOps Engineer:

1. Difference between RedHat, Debian, CentOS and Kali Flavors
2. Able to perform linux day to day tasks.
    a. SSH custom port customization
    b. Making of SFTP and FTP user
    c. Increasing SWAP memory
    d. Monitoring memory utilization
    e. Extensive use of grep command
    f. Firewall
    g. Configuration of your environment
    h. Redirection of input and output
    i. Shell or Bash Scripting
    j. Variables
    k. Loops and Conditionals
    l. Accepting user input
    m. Managing users/groups permission
    n. Cron creation
    o. for bash scripts

    p. Freeing disk memory
    q. Installing and configuring different versions for different packages.
3. Optimization of the web servers
    a. For static content serving
    b. Setting up multiple sub domains on same instance
    c. Setting up different apps on different routes
    d. Setting up SSL certificates
4. Leveling up AWS expertise,
    a. EC2 Configurations with security groups integrating Load Balancers and Auto-scaling groups
    b. Configure Code-Deploy applications and Deployment-Groups
    c. Making Target-groups with having custom VPC and Custom Sub-nets
    d. Using NAT gateways
    e. Custom IAM roles and users
    f. Using ECR and ECS ( making task definitions )
    g. Usage of Lambda and Fargate
    h. Using s3 bucket as a static website
    i. Monolithic Database - RDS, S3 or DynamoDB
    j. Code-pipeline for CI/CD
    k. Setup Cloudfront for high availability
    l. Elastic Cache
    m. Route-53
    n. AWS-SDK
5. Understanding of Ansible
    a. Ad Hoc commands
    b. Playbooks
    c. Setting up environments for deployments
6. knowledge of different monitoring tools
    a. Prometheus (Preferred)
    b. Graffana (Preferred)
    c. Zabbix
    d. Nagios
7. Able to set up monitoring agents in different environments.
8. Understanding of the Infrastructure as a code
    a. Terraform
    b. Cloud Formation
9. Able to perform different Infrastructure provisioning.
10. Should be able to migrate the wordpress websites from one environment to another.
11. Should be able to run the migrations of databases.
12. Understanding of containerization
    a. Building Images for Node apps

    b. Making Images from running containers
    c. Building network bridges among containers
    d. Making virtual networks for different containers
    e. Accessing containers and monitoring them
    f. Writing  Docker-compose scripts for multi containers deployment
    g. Optimizing containers
    h. Mounting Volumes to different containers.
13. Understanding of containers orchestration
    a. Using kubernetes for containers orchestration
    b. What are replicasets and what are their uses ?
    c. Making ReplicaSets
    d. What are Pods ? How are they different from Clusters ?
    e. Making Pods and deploying on different Cluster of servers
    f. What are services and where are they used ?
    g. Making different services
    h. Extensive use of Kubectl

**Time Period: Best = 5 months, Good = 6 months, Average = more than 6 months**

# Senior DevOps Engineer:

1. Full understanding of the different linux distributions.
2. Extensive knowledge on different OS file systems and structure.
3. Should be able to visualize the architecture of the applications.
4. Should know the development practices as well to debug the runtime errors.
5. Understanding to different development languages,
    a. React.js
    b. Node.js
6. Understand the dependency management of the application and be able to debug issues related to different dependencies.
7. Should be able to understand and architect the cross platform cloud infrastructure.
8. Should have knowledge of different testing tools,
    a. Selenium
    b. Appium
    c. Cucumber
9. Should be able to incorporate different tests in the CI/CD pipelines.
10. Should be able to incorporate web 3.0 mindset in the devOps technologies.
11. Should have knowledge to design a network architecture to run a blockchain.
12. Should be able to develop & understand the microservices.
13. Understand different patterns of microservices.

14. AWS for microservices,
    a. EKS
    b. X-Ray
    c. SQS
    d. SNS
    e. Kinesis
    f. API Gateway
    g. Cognito
    h. Serverless Application Model
    i. CloudTrail
    j. Monitoring
    k. Troubleshooting & Audit: AWS CloudWatch.
15. Should be able to mitigate any kind of threat and plan disaster recovery plans in advance.
16. Should be able to do audits of different platforms provisioned by other devOps engineers.

**Time Period: Best = 5 months, Good = 6 months, Average = more than 6 months**

**Notice: Blockchain learning is not included in this document which is also mandatory for devOps engineers.**