DEVOPS [CI/CDTOOLS]

- **Introduction to CI/CD**

  - Definition and importance of CI/CD
  - Key concepts: automation, continuous integration, continuous deployment

- **Version Control Systems (Review)**

  - Git fundamentals
  - Branching strategies

- **Continuous Integration (CI)**

  - Introduction to CI pipelines
  - Jenkins:
    - Installation and configuration
    - Creating and running jobs
    - Plugins and integrations

- **CI/CD Tools**

  - CircleCI:
    - Setup and configuration
    - Writing configuration files (`.circleci/config.yml`)
  - GitLab CI/CD:
    - Pipelines and jobs
    - CI/CD configuration in GitLab

- **Containerization and Orchestration**

  - Docker:
    - Container basics
    - Dockerizing applications
  - Kubernetes:
    - Introduction and basic concepts

- **Continuous Deployment (CD)**

  - Deployment strategies
  - Deployment pipelines in CI/CD tools

- **Testing Automation**

  - Automated testing frameworks
  - Integration of tests in CI pipelines

- **Monitoring and Logging**

  - Introduction to monitoring tools (e.g., Prometheus, Grafana)
  - Logging best practices

- **Security and Compliance**

  - Security considerations in CI/CD pipelines
  - Compliance with industry standards

- **Case Studies and Best Practices**

  - Real-world examples of CI/CD implementations
  - Best practices for successful CI/CD adoption

- **Advanced CI/CD Pipeline Concepts**

  - Pipeline as code using Jenkins DSL or Groovy
  - Multibranch pipelines and parallel execution
  - Advanced pipeline orchestration and triggers

- **Advanced CI/CD Tools**

  - Spinnaker:
    - Introduction to Spinnaker for CD
    - Setup and configuration
    - Deploying applications with Spinnaker

- **Containerization and Orchestration**

  - Docker Advanced Topics:
    - Docker networking and storage
    - Docker Compose for multi-container applications
  - Kubernetes Advanced Topics:
    - Operators and custom resources
    - Advanced deployment strategies (Canary, Blue/Green)

- **Infrastructure as Code (IaC)**

  - Introduction to Terraform or Ansible for infrastructure provisioning
  - Integrating IaC with CI/CD pipelines

- **Advanced Deployment Patterns**

  - Canary deployments with Istio or other service mesh technologies
  - A/B testing strategies and implementations

- **Security and Compliance**

  - Container security best practices
  - Implementing security scans in CI/CD pipelines (e.g., Clair, Trivy)
  - Compliance automation and reporting

- **Monitoring, Logging, and Observability**

  - Advanced monitoring with Prometheus and Grafana
  - Application performance monitoring (APM) tools integration
  - Distributed tracing and logging with tools like ELK stack or Fluentd

- **CI/CD for Microservices**

  - Challenges and solutions in CI/CD for microservices architecture
  - Service mesh considerations

- **Advanced Integrations and Extensibility**

  - Integrating third-party tools and services with CI/CD pipelines
  - Custom plugins and extensions development