Steps of CI/CD pipeline

1. Unit Testing:

Unit testing means checking small parts of your program to make sure they work correctly. It's like testing individual pieces of a puzzle to ensure they fit.

Example: If you have a function that adds two numbers, unit testing checks if it correctly adds numbers like 2 + 3 = 5.

2. Static Code Analysis:

Static code analysis is like having a robot look at your code and point out mistakes or bad practices without running it. It helps find errors, warnings, or areas where the code could be better.

Example: A tool scans your code and tells you if you wrote something that doesn't make sense or if there's something that could cause problems later.

3. Code Quality/Vulnerability:

Code quality refers to how clean and understandable your code is, and vulnerability means weaknesses in the code that hackers could exploit. Good code should be clean, easy to read, and safe.

Example: Good code is well-organized and easy for others to read. Vulnerabilities might be things like allowing users to enter bad data that can break your program or let hackers in.

4. Automation:

Automation means using tools to do repetitive tasks automatically, like testing, building, or deploying code, instead of doing them manually.

Example: Every time you make a change to your code, a tool can automatically run tests to check if everything is working and then send the updated code to a website or app, without you needing to click any buttons.

5. Report:

A report is a summary of results, showing whether tests passed or failed, how well the code performs, or other important details.

Example: After running tests, a report tells you if everything is working fine or if there were any issues, like "5 tests passed, 1 test failed."

6. Deployment:

Deployment is the process of making your program available for people to use. It means moving your code from your computer (development environment) to a server or platform where others can access it.

Example: When you finish building an app, deployment is when you upload it to the App Store or make it live on a website so users can use it.

Tools used in CICD

1. Unit Testing

Tools:

- JUnit (Java)
- pytest (Python)
- NUnit (C#)
- Mocha (JavaScript)

2. Static Code Analysis

Tools:

- SonarQube
- ESLint (JavaScript)
- Pylint (Python)
- Checkstyle (Java)

3. Code Quality / Vulnerability

Tools:

- SonarQube (for both code quality and security issues)
- OWASP Dependency-Check (for security vulnerabilities)
- Fortify (for security testing)
- Checkmarx (for security vulnerabilities)

4. Automation

Tools:

- Jenkins (CI/CD automation)
- GitLab CI/CD (automated pipelines)

- Travis CI (continuous integration)
- CircleCI (continuous integration)

5. Report

Tools:

- JUnit Reports (for unit test results)
- SonarQube Dashboards (for code quality and vulnerabilities)
- Jenkins Build Reports (for build and test results)
- Allure (for test reporting)

6. Deployment

Tools:

- Docker (containerization)
- Kubernetes (orchestration of containers)
- AWS Elastic Beanstalk (cloud deployment)
- Heroku (cloud deployment)
- Ansible (automated configuration management)