DEVOPS ASSIGNMENT-1

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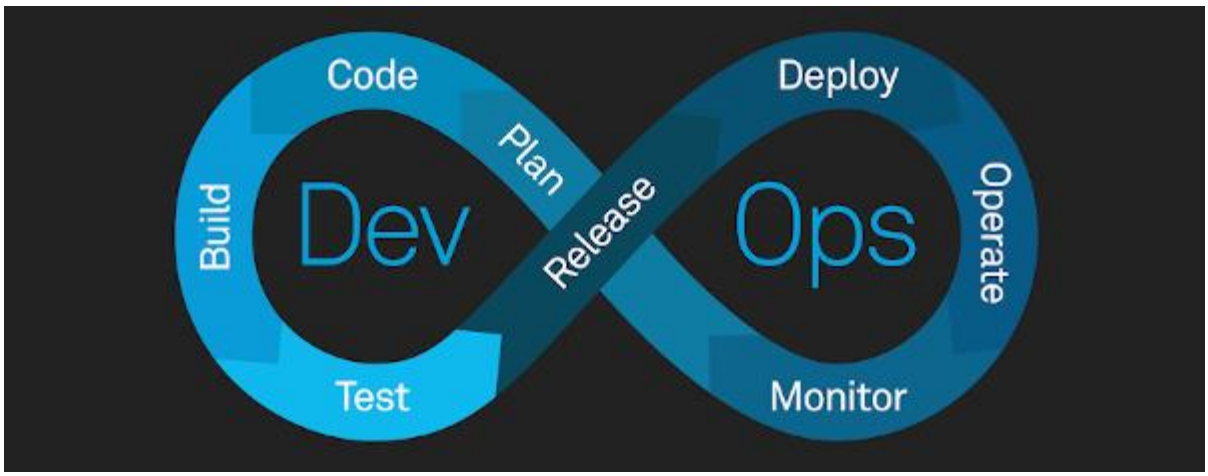
1)What is CICD?

- CI stands for continuous integration, a fundamental DevOps best practice where developers frequently merge code changes into a central repository where automated builds and tests run. But CD can either mean continuous delivery or continuous deployment.
- In continuous integration ,the developer's changes are validated by creating a build and running automated tests against the build. By doing so, you avoid integration challenges that can happen when waiting for release day to merge changes into the release branch.
- Continuous integration puts a great emphasis on testing automation to check that the application is not broken whenever new commits are integrated into the main branch.
- Continuous delivery is an extension of continuous integration since it automatically deploys all code changes to a testing and/or production environment after the build stage.
- This means that on top of automated testing, you have an automated release process and you can deploy your application any time by clicking a button.
- In theory, with continuous delivery, you can decide to release daily, weekly, fortnightly, or whatever suits business requirements.
- Continuous deployment goes one step further than continuous delivery. With this practice, every change that passes all stages of your production pipeline is released to your customers. There's no human intervention, and only a failed test will prevent a new change to be deployed to production.Continuous deployment is an excellent way to accelerate the feedback loop with customers and take pressure off the team as there isn't a "release day" anymore.



2)What are feature flags?How does it effect CICD?

- Feature flags, also known as feature toggles or release toggles, allow you to enable or disable specific functionality in your software without updating the code itself.
- Feature flags are particularly useful if you're practicing CI/CD , as they allow you to keep merging to and deploying from master without immediately making new features available to users. Separating deployment from launch also makes it easier to coordinate product and marketing efforts with the availability of a new feature.
- CI helps developers spot problems early in the process of delivering features to customers. As the developer team grows, it becomes more complicated to integrate everyone's code. Feature flags will let you switch off a portion of code that's causing problems after being integrated.
- CD is a practice to deliver changes to the customer's hands frequently, steadily, and predictably. The types of changes you deliver with CD can be anything from a simple configuration change to an entirely new feature to a bug fix.
- The important thing is to treat every change equally, meaning that even if it's an emergency, you'll avoid doing things out of the scope of the CD pipeline. And feature flags will help with this because, even when a change is live, you could always disable it and stop the bleeding.

3)What is CI/CD pipeline?

- A continuous integration and continuous deployment (CI/CD) pipeline is a series of steps that must be performed in order to deliver a new version of software.
- CI/CD pipelines are a practice focused on improving software delivery throughout the software development life cycle via automation.

CI/CD pipeline phases:

From source code to production, these phases make up the development lifecycle and workflow of the CI/CD pipeline:

- **Build:** This phase is part of the continuous integration process and involves the creation and compiling of code. Teams build off of source code collaboratively and integrate new code while quickly determining any issues or conflicts.
- **Test:** At this stage, teams test the code. Automated tests happen in both continuous delivery and deployment. These tests could include integration tests, unit tests, and regression tests.

- **Deliver:** Here, an approved codebase is sent to a production environment. This stage is automated in continuous deployment and is only automated in continuous delivery after developer approval.
- **Deploy:** Lastly, the changes are deployed and the final product moves into production. In continuous delivery, products or code are sent to repositories and then moved into production or deployment by human approval. In continuous deployment, this step is automated.
- By automating CI/CD throughout development, testing, production, and monitoring phases of the software development lifecycle, organizations are able to develop higher quality code, faster. Although it's possible to manually execute each of the steps of a CI/CD pipeline, the true value of CI/CD pipelines is realized through automation.
- A pipeline is a process that drives software development through a path of building, testing, and deploying code, also known as CI/CD. By automating the process, the objective is to minimize human error and maintain a consistent process for how software is released.
- CI/CD is the backbone of a DevOps methodology, bringing developers and IT operations teams together to deploy software. As custom applications become key to how companies differentiate, the rate at which code can be released has become a competitive differentiator.