What is CI/CD?

Continuous Integration:

It's the process of "**Making**“ : merging, building and testing all developers’ work using an automated approach to bring out high quality, deployable artifact.

Continuous Deployment:

It's the process of “**Moving**“ the artifact to production environment through automated deployments delivering value to the customer faster and more frequent.

CI/CD Fundamentals

- **Pipeline**: A set of data processing elements connected in series, where the output of one element is the input of the next one.
  - **Continuous Integration**: The practice of merging all developers' working copies to a shared mainline several times a day.
    - **Continuous Delivery**: An engineering practice in which teams produce and release value in short cycles.
      - **Continuous Deployment**: A software engineering approach in which the value is delivered frequently through automated deployments.
        - **Infrastructure as Code**: The management of infrastructure using code.
      - **Provisioning**: The process of setting up IT infrastructure.
    - **Artifact**: A product of some process applied to the code repository.
  - **DevOps**: A set of practices that works to automate and integrate the processes between software development and IT teams.
- **Testing**: A practice that seeks to ensure the quality of the software.

Why CI/CD?

Increase Revenue:

- Releasing new features more quickly.
- Delivering value to the customer more frequent.
- Building up trust with customer by delivering high quality software.

Protect Revenue:

- Reducing downtime during upgrade activities due to crashes or major bugs.
- Quick rollback to restore production working state.

Why CI/CD?

Reduce Cost:

- Early detection of code defects preventing wasting time on further deployment steps.
- Cleaning up unneeded infrastructure resources automatically.

Avoid Cost:

- Reducing bugs detected at production stage.
- Preventing costly security holes.
- Faster deployments and less errors during infrastructure provisioning.