Assignment - 1

## **DevOps**

### **1. What is DevOps?**

DevOps is a set of practices that combines software development (Dev) and IT operations (Ops) to improve the speed, quality, and reliability of software development and delivery. It emphasizes automation, collaboration, continuous integration, and continuous delivery (CI/CD) to streamline the development lifecycle.

### **2. What is Cloud Computing? List some popular cloud platforms.**

Cloud computing is the delivery of computing services (such as servers, storage, databases, networking, software, and analytics) over the internet, eliminating the need for physical infrastructure.

**Popular Cloud Platforms:**

* **Amazon Web Services (AWS)**
* **Microsoft Azure**
* **Google Cloud Platform (GCP)**
* **IBM Cloud**
* **Oracle Cloud**

### **3. What is CI/CD? (Explain as per your understanding)**

CI/CD stands for **Continuous Integration** and **Continuous Deployment (or Delivery)**.

* **Continuous Integration (CI):** Automates the process of integrating code changes into a shared repository multiple times a day. It includes automated testing to detect bugs early.
* **Continuous Deployment (CD):** Extends CI by automatically deploying code to production after passing tests. It ensures faster delivery and reduces manual intervention.
* **Continuous Delivery:** Ensures that the code is always ready for deployment but may require manual approval before going live.

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### **4. Benefits of DevOps**

* **Faster software delivery** with automation
* **Improved collaboration** between development and operations teams
* **Higher software quality** through continuous testing and monitoring
* **Scalability and flexibility** using cloud and automation tools
* **Better security and compliance** with automated processes

## **GIT**

### **1. What is Git?**

Git is a distributed version control system that helps developers track changes in their codebase, collaborate efficiently, and manage different versions of their projects.

### **2. What are the key features of Git?**

* **Distributed system** – Every developer has a local copy of the repository.
* **Branching and Merging** – Developers can create separate branches for features and merge them later.
* **Lightweight and Fast** – Optimized for performance.
* **Version Tracking** – Keeps a history of changes.
* **Data Integrity** – Ensures file security with cryptographic hashing.

### **3. What is the difference between Git and SVN?**

| **Feature** | **Git** | **SVN** |
| --- | --- | --- |
| Type | Distributed VCS | Centralized VCS |
| Branching | Lightweight and fast | Heavyweight and slow |
| Offline Work | Possible | Requires internet |
| Repository Structure | Each user has a full copy | Centralized repository |
| Performance | Faster operations | Slower compared to Git |

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### **4. What is the difference between Git and GitHub?**

* **Git** is a version control system that manages source code history.
* **GitHub** is a cloud-based hosting platform for Git repositories, offering collaboration tools like pull requests and issue tracking.

### **5. Some Basic Git Commands and Their Uses**

* git init – Initializes a new Git repository.
* git clone <repo\_url> – Clones an existing repository from a remote source.
* git add <file> – Stages changes for commit.
* git commit -m "message" – Commits staged changes with a message.
* git push origin <branch> – Pushes commits to a remote repository.
* git pull origin <branch> – Pulls the latest changes from a remote branch.
* git checkout <branch> – Switches between branches.
* git merge <branch> – Merges another branch into the current branch.

### **6. What is the git status command used for?**

The git status command displays the current state of the working directory and staging area. It helps in checking:

* Untracked files
* Changes staged for commit
* Changes not yet staged
* Current branch status