DevOps Fellowship – Week 2 Report

Introduction

In this week, I covered three important topics: **Shell Scripting**, **Git (Branching, PRs, and Undoing Mistakes)**, and **Cloud Computing Fundamentals & Major Providers**.

Shell Scripting

Shell scripting automates tasks in Linux by executing commands inside a script. It saves time, reduces human error, and simplifies system management.

Key Concepts

1. **Displaying Output** – `echo` command displays text or variable values.
2. **Variables** – Store strings or numbers, making scripts flexible and reusable.
3. **Command Line Arguments** – Special variables like `$0`, `$1`, `$@`, and `$#` handle script name, arguments, and counts.
4. **Input Handling** – `read` command makes scripts interactive.
5. **Arithmetic Operations** – Basic math supported; `bc` used for decimals.
6. **If-Else Conditional** – Executes commands based on logical checks.
7. **For Loop** – Repeats a block of code for a defined set of items.
8. **While Loop** – Executes until a condition becomes false.
9. **Case Statement** – Handles multiple conditions cleanly.
10. **Exit Codes** – `0` = success, non-zero = failure.
11. **Functions** – Group reusable commands for modular scripting.

12. **Shift Usage** – Processes arguments one by one.

13. **Getopts** – Handles script options like `-u` and `-p` for professional input handling.

Git Branching, Pull Requests, and Undoing Mistakes

Git enables safe collaboration through branches, commits, pull requests (PRs), and recovery methods.

Key Steps

1. **Initializing Repository** – Create repo, add files, commit, and push to `main`.
2. **Development Branch** – Create `dev` branch for isolated work.
3. **Adding & Committing Files** – Stage and commit changes on `dev`.
4. **Opening Pull Requests** – PRs merge changes from `dev` into `main` with review.
5. **Merging PRs** – Approved PRs sync code across branches.
6. **Divergence & Syncing** – Handled by merging new PRs when `dev` and `main` diverge.
7. **Undoing Mistakes**:
    - `reset --soft` – Undo commit, keep changes.
    - `reset --hard` – Remove commit and changes completely.
    - `revert` – Safely undo a pushed commit without breaking history.
    - `checkout` – Restore file to last committed state.
    - `force push` – Rewrites history (risky, not recommended).

Cloud Computing Fundamentals & Providers

What is Cloud Computing?

On-demand delivery of computing services (servers, storage, networking, databases, software) over the internet, usually pay-as-you-go.

Service Models

- **IaaS** – Virtualized resources (e.g., AWS EC2, Azure VMs, GCP Compute Engine).
- **PaaS** – Managed app platforms (e.g., Elastic Beanstalk, App Engine).
- **SaaS** – Internet-delivered software (e.g., Gmail, Office 365).

Deployment Models

- **Public Cloud** – Shared, internet-based (AWS, Azure, GCP).
- **Private Cloud** – Dedicated to one organization (OpenStack, VMware).
- **Hybrid Cloud** – Combination of public and private (Azure Stack, AWS Outposts).
- **Multi-Cloud** – Using multiple providers together.

Major Providers & Services

- **AWS** – EC2, Lambda, S3, RDS, VPC, IAM.
- **Azure** – VMs, Functions, Blob Storage, Azure SQL, AD.
- **GCP** – Compute Engine, Cloud Functions, BigQuery, Cloud Storage, IAM.

Conclusion

This week's learning covered three essential DevOps areas:

- **Shell scripting** builds automation and efficiency in Linux environments.
- **Git workflows** enable structured collaboration with branches, PRs, and recovery methods.
- **Cloud computing** provides scalable infrastructure and services across AWS, Azure, and GCP.