Week 3 Report - Buildbles Fellowship

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 Topic: Docker & GitHub Actions

Introduction

In Week 2 of the Buildbles Fellowship, my focus was on **Docker** and **GitHub Actions**. Docker is a containerization platform that simplifies application packaging and deployment by ensuring consistency across environments. GitHub Actions, on the other hand, is a powerful CI/CD automation tool that allows developers to automate workflows directly from their GitHub repositories. Learning both together gave me hands-on experience with modern DevOps practices, from containerization to continuous integration and deployment.

Key Learnings

1. Docker Fundamentals

- Understanding Docker images, containers, and layers

- Writing and optimizing Dockerfiles

- Managing containers with `docker run`, `docker ps`, and `docker exec`

- Exposing ports and managing volumes for persistent storage

2. Docker in Practice

- Containerizing a simple Flask backend and React frontend

- Using Docker Compose to manage multi-container applications

- Building, tagging, and pushing images to Docker Hub

3. GitHub Actions Fundamentals

- Workflow syntax (`.github/workflows/`)

- Understanding triggers like `push`, `pull_request`, and `workflow_dispatch`

- Using predefined and custom actions from the GitHub Marketplace

- Setting up jobs, runners, and matrix builds

4. GitHub Actions in Practice

- Automating Docker image builds and pushes on every commit

- Running tests automatically on pull requests

- Creating multi-step workflows for CI/CD

- Integrating GitHub Actions with Kubernetes deployments

Hands-on Practice

- Built and containerized applications using Docker and Docker Compose

- Wrote GitHub Actions workflows to build, test, and push Docker images automatically

- Integrated Docker and GitHub Actions workflows to simulate a CI/CD pipeline

- Pushed images to Docker Hub and verified deployment on Kubernetes

Conclusion

This week enhanced my DevOps skillset by combining Docker for containerization and GitHub Actions for automation, giving me real-world exposure to modern CI/CD workflows.