Build a CI/CD Pipeline with Docker: From Code to Deployment

Key Takeaways

Task 1

Title: Containerize Spring Boot app with Docker and Docker Compose

- **Docker** simplifies app deployment by packaging code and dependencies into a container image.
- Use **Dockerfile** to define the build process for a Spring Boot application.
- Docker Compose allows multi-container applications to run together using **docker-compose.yml**.

Task 2

Title: Set up GitHub Actions pipeline for building Docker image

- GitHub Actions automates CI/CD workflows for repositories.
- Define pipeline steps in **.github/workflows** to build and test Docker images.
- A successful CI pipeline ensures a production build-ready Docker image.

Task 3

Title: Authenticate and push Docker images to AWS ECR registry with Github Actions

- **AWS ECR** (Elastic Container Registry) stores Docker images securely.
- Authenticate pipelines with **AWS IAM** credentials and configure GitHub Secrets.
- Automate image pushes to ECR from the **CI** pipeline for reliable storage and versioning.

Task 4

Title: Practice Activity

Reinforce concepts by containerizing an additional application and automating its build process

Task 5

Title: Set up EC2 to pull and run Docker images from ECR

- Create an IAM role for EC2 service and launch an EC2 instance with the right configurations.

- Install Docker and Docker Compose and **Amazon-ecr-credential-helper** on **EC2** for the environment setup.
- EC2 instances can pull Docker images using the created IAM role for authentication.
- Pull and run Docker images directly from ECR for manual testing.

Task 6

Title: Automate the deployment of the application to EC2 with CD pipeline

- Use SSH keys stored in GitHub Secrets for secure access to the EC2 instance.
- Configure the pipeline to automate deployment by pulling and running Docker containers on EC2.
- Verify the pipeline by testing the complete CI/CD workflow after pushing code changes.

Additional Resources:

- All necessary ZIP files and the script for installing the EC2 requirements are attached in the Key Takeaways/Resources section of the user interface.