**Practical DevOps for Devs – Assignment**

**Prerequisites**

1. Need to have AWS/Azure with the necessary permissions and access credentials.
2. GitHub account.

**Assignment description**

1. Setting up a CI/CD Pipeline and deploying applications on AWS EKS. – 6 points.
2. Reuse Jenkins CI and use GitOps for the CD pipeline – (CD- 3 points)
3. Setting up a CI/CD Pipeline and deploying applications on Azure AKS (Nice to have). – 1 point

**Condition to pass the assignment.**

You need to get 7/10 points to pass the assignment.  
**Assignment submitting.**

We will provide you with a folder named [Submit Assignment](https://harveynashvn.sharepoint.com/:f:/s/Dept-HR/EmGrdVGNdQNLs5xhiCOd4bgBlctOMASUjnKFlFFPOIlUpw?e=RewjOp). You need to:  
- Create a sub folder inside it with your staff code's name + your name. (ex: SD0123 – Nguyen Van A)

* Inside your staff code folder, put a text file with the following information:
  + Your full name: Nguyen Van A
  + Your Staff Code: SD0123
  + Link of your GitHub repositories
* Notes: Inside the application repository, you need to have a folder named 'Document.' In the 'Document' folder, include a Word file or video recording that captures your performance.

**Deadline:** 21-08-2023

1. **Setting up a CI/CD Pipeline and deploying applications on AWS EKS**

You will be provided with a CI/CD diagram outlining the pipeline's high-level structure. Your task is to follow the diagram and set up the CI/CD pipeline based on the tools and configurations specified.

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**Assignment Tasks**

1. **Source Code Management**  
   - You would need to have a repository for the MSA application. You can clone the source code from <https://github.com/nashtech-garage/kubernetes/tree/master/src>

App repository pattern: [https://github.com/<your-github-name>/<staffcode\_msa](https://github.com/%3cyour-github-name%3e/%3cstaffcode_msa)>

Example: https://github.com/hoanglecao/sd0660\_msa  
- You also need another repository for infrastructure. Provision codes and manifest files will be stored in this repository.  
App repository pattern: [https://github.com/<your-github-name>/<staffcode\_aws\_infrastructure](https://github.com/%3cyour-github-name%3e/%3cstaffcode_aws_infrastructure)>

Example: <https://github.com/hoanglecao/sd0660_aws_infrastructure>

1. **Provision AWS resources**Use Terraform to provision VPC, EC2, ECR and EKS on AWS  
   Use <https://github.com/nashtech-garage/terraform-demo> as a reference.
2. **Installation**

You need to have Docker and Jenkins servers installed on EC2.

1. **Setup Jenkins pipeline for CI/CD**

Use <https://github.com/nashtech-garage/devops-ci-cd>as a reference.

1. **Monitoring**Set upPrometheus and Grafana to monitor EKS resources and default EKS resource metric.
2. **Reuse Jenkins CI and use GitOps for the CD pipeline.**

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**Assignment Tasks**

1. Install Argo CD on your EKS Cluster
2. Create an application in Argo CD (you can use GUI or CLI)
3. Install Argo CD Image Update (https://argocd-image-updater.readthedocs.io/en/stable/install/installation/). This will help you listen to changes the image on ECR and update the image tag in Ops repo.

Use GitOps\_HandsOn file as a reference.

1. **Setting up a CI/CD Pipeline and deploying applications on Azure AKS (Nice to have).**

You will be provided with a CI/CD diagram outlining the pipeline's high-level structure. Your task is to follow the diagram and set up the CI/CD pipeline based on the tools and configurations specified.

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**Assignment Tasks**

1. **Source Code Management**  
   - Reuse repository for MSA application.  
   - Need to create another repository for infrastructure. Provision codes, manifest files will be stored in this repository.

App repository pattern: https://github.com/<your-github-name>/<staffcode\_azure\_infrastructure>

Example: https://github.com/hoanglecao/sd0660\_azure\_infrastructure

1. **Provision Azure Resources**

* Use Terraform to provision Azure Virtual Network, ACR and AKS on Azure.

Use https://github.com/nashtech-garage/terraform-demo as a reference.

1. **Setup Azure DevOps pipeline for CI/CD**

Use https://github.com/nashtech-garage/azure-devops-ci-cdas a reference.

1. **Monitoring**Set upPrometheus and Grafana to monitor AKS resources and default AKS resource metric.