ACIT 4850 – Enterprise Systems Integration – Assignment 3 Preview

<u>This assignment is to be completed and submitted individually.</u>

<u>Overview</u>

You are going to conduct a final assessment related to your Enterprise Development Environment on one of the following topics:

- Microservices Pipelines – Create the CI pipelines for your 3855 services
- Git Workflows – Truck Based vs Feature Branch Workflows
- Environments – On Premise vs Cloud

<u>Options</u>

For this assignment, you will choose <u>one</u> of the following three options for your assessment. **<u>You will complete you assessment in-class during the last class (week of Nov. 29th).</u>**

The first option is more of a practical assessment that will require work in advance of the class. The second two options are written and may be completed within 2 hours in class.

Option 1 – CI Pipelines for 3855 Microservices

This option will require completion before class and a brief demo in-class.

Using a single shared library and a Jenkinsfile per service, create a CI pipeline for each of your Python based 3855 microservices (Receiver, Storage, Processing and Audit) in your Jenkins installation. The pipeline can pull the code for your services from your existing Git repo on GitLab.com or GitHub.com, it doesn't need to be put in to your own GitLab installation.

The CI pipeline must have at minimum the following three stages:

- (2 marks) Lint – Run pylint on your code and enforce a minimum score of 5 out of 10. You may have to fix some of the warnings in your code to get to pass this stage.
- (2 marks) Package – Builds the docker image and pushes it to a repository in your Dockerhub account
- (2 marks) <Your Stage> - A stage of your choice that performs some useful action. For instance invokes a scan of your image in DockerHub, verifies some properties of your image, etc.

Then update your docker-compose.yml file to use the images from your Dockerhub account (2 marks).

Your demostration must include:

- (2 marks) Running of the CI pipeline of each service and showing the updated image in Dockerhub
- (2 marks) Proving and showing that Docker Compose is using your images on Dockerhub
    - Show the updates you made to the file
    - Show a change made to one of your services getting built by your CI pipeline and then redeployed via a docker-compose up –d command

The submission to the dropbox on D2L must include the following to receive your marks:

- Updated docker-compose.yml file
- Screenshot of the pipeline stages in Jenkins for one of your services (successfully built)
- Screenshots of your Dockerhub showing the repositories for the services

Option 2 - Truck Based vs Feature Branch Workflow

The assessment must be written (full-sentences/paragraphs) and may include questions such as:

- (4 marks) Describe the Truck Based (i.e., centralized) and Feature Branch Git Workflows
- (4 marks) Compare and contrast the two workflows. Include any benefits and drawbacks of each.
- (4 marks) For each workflow, identify the scenarios in which you would use them.
    - Ex: Given a scenario of a development team, would you use a Truck Based or Feature Based workflow, and why?

References are required for any online resources you use.

Levels of Mastery	**Level 1**	**Level 2**	**Level 3**	**Level 4**
	A limited mastery of knowledge and skills: below basic expectations	A partial mastery with limited to basic performance of expected achievement	A solid consistent performance; demonstrated competency of knowledge and skills	A superior, consistent performance; beyond expectations
	Major Problems Exist	**Minor Problems Exist**	**Minor Issues Exist**	**No Issues Exist**
Descriptions	Minimal or no content	Description of each workflow is incomplete. No unique elements.	Description of each workflow is mostly complete. Mostly unique elements.	Description of each workflow is complete. The content is highly refined. All elements are unique.
Compare/Contrast	Minimal or no content	Advantages/Disadvantages of each workflow are incomplete. No unique elements.	Advantages/Disadvantages of each workflow are mostly complete. Some references provided.	Advantages/Disadvantages of each workflow are complete with supporting references and/or tables/graphics.

			Mostly unique elements.	The content is highly refined. All elements are unique.
Scenarios	Minimal or no content	Scenarios are incorrect or complete. No justifications of the choice of scenarios. No unique elements.	Scenarios are mostly complete/correct with some justification provided. Some relations back to the other sections. Mostly unique elements.	Scenarios are fully complete and relate back to the descriptions and compare/contrast sections. The content is highly refined. All elements are unique.

Option 3 – On Premise vs Cloud

The assessment must be written (full-sentences/paragraphs) and may include questions such as:

- (4 marks) Provide definitions of on-premise and cloud
    - Infrastructure – What is the difference between cloud (IaaS) and on-premise infrastructure?
    - Tooling– What is the difference between cloud (SaaS) and on-premise tools?
- (4 marks) Describe the criteria you would use to decide to use on-premise infrastructure verus cloud infrastructure (make sure to include functional and non-functional requirements)
- (4 marks) Identify scenarios for when you you would use cloud or on-premise infratructure for your Enterprise Development and Production Environments

References are required for any online resources you use.

Levels of Mastery	**Level 1**	**Level 2**	**Level 3**	**Level 4**
	A limited mastery of knowledge and skills: below basic expectations	A partial mastery with limited to basic performance of expected achievement	A solid consistent performance; demonstrated competency of knowledge and skills	A superior, consistent performance; beyond expectations
	Major Problems Exist	**Minor Problems Exist**	**Minor Issues Exist**	**No Issues Exist**
Descriptions	Minimal or no content	Description of cloud and on-premise is incomplete. No unique elements.	Description of cloud and on premise is mostly complete. Mostly unique elements.	Description of cloud and on premise is complete. The content is highly refined. All elements are unique.

Criteria	Minimal or no content	Selection criteria is incomplete. No unique elements.	Selection criteria for cloud vs on-premise is mostly complete. Some references provided. Mostly unique elements.	Selection criteria for cloud vs on-premise is complete with supporting references and/or tables/graphics. The content is highly refined. All elements are unique.
Scenarios	Minimal or no content	Scenarios are incorrect or complete. No justifications of the choice of scenarios. No unique elements.	Scenarios are mostly complete/correct with some justification provided. Some relations back to the other sections. Mostly unique elements.	Scenarios are fully complete, justified and relate back to the descriptions and selection criteria. The content is highly refined. All elements are unique.