PROG8850- Database Automation

Assignment 4 (Total: 20 points)

Assignment 4
Exploring and Implementing Database Automation with Advanced

Tools

Tasks

Question 1: Analysis and Integration of Database Automation Tools (8 Points)

1.1) Select any two database automation tools from the following list: Jenkins, GitHub Actions, Azure DevOps, GitLab CI/CD, Liquibase, Flyway, Ansible. For each tool: - Provide a brief overview and key features.
- Create a comparison table evaluating the two tools based on- Ease of Use, Integration with CI/CD Pipelines, and Supported Databases

1.2) Integration Strategy: Propose a strategy to integrate the two selected tools into a CI/CD pipeline for a software project.

Question 2: Hands-on Exercise Using Ansible (12 Points)

Task: Implement an up.yaml and down.yaml ansible-playbook that deploys a Mysql database, includes a schema update step, validates the update and creates a migration when down.yaml is run for the next time up.yaml is run.

Steps

1) ***Initial Setup-*** Use the provided Git repository to create and maintain a database of subscribers and their email addresses:

- Script 1: **'up.yaml'** – Starts mysql, initializes the database so that it can be used by flyway and run's flyway to apply the migrations. up.yaml needs to be idempotent

- Script.2 dbtests.py - tests the schema to make sure that it contains the required structure for the current commit to the repository. You will need to

continue adding to this every time you make a commit.

- Script 3: **'down.yaml'** – makes a migration to seed the database with any data that was added since the last commit and stops the database. You will run down.yaml when you are done with the lab, and then commit the results for the next time you create the database.

2) **Change-** you will make a change to the database to add the subscription date to your subscriber table. The subscription date needs to be automatically populated when a new row is inserted:

- Step 1: Make a migration and test manually by adding a new subscriber.
- Step 2: Update dbtests.py with test(s) for your change.
- Step 3: run down.yaml to shutdown and save state.
- Step 4: run a commit and push so that your data is preserved

3) **Submission**

- Submit the zip of your repository, also including a .pdf of your answer to question 1**.**

Points Breakdown of Question 2:

- Correct setup and deployment of the up and down.yaml: 4 Points
- Execution of the flyway schema update: 4 Points
- Validation of the schema update in dbtests.py: 4 Points

<u>Notes for Submission:</u>

- Submit your assignment as a ZIP file including:
  - A Word/PDF document with your answers to Question 1 (overview, comparison, and strategy).
  - zip of your repository including pdf.
- Ensure your submission is organized and well-documented:
- Cite any references used
- Code should be clean and well-commented:
  - Include comments in the '.yml' file(s) to explain key steps.