PROG8850- Database Automation

Assignment 4 (Total: 20 points)

Assignment 4
Exploring and Implementing Database Migration with Advanced Tools

Tasks

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

1.1) Select any two database automation tools from the following list: Liquibase, Flyway, Alembic, Microsoft Entity Framework Core (EF core), . 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 Flyway (12 Points)

Task: Implement an up.yaml and down.yaml ansible-playbook that deploys a Mysql database in a new environment.

Steps

1) ***Up and down (2 marks)*** .yml files to scaffold and remove a new environment. The up.yml should use nektos act to run the initial migrations
2) ***Initial Setup (2 marks) -*** Use the provided Git repository and create a migrations folder and flyway command to create a new database, with a user that can only access that database to create and maintain a database of subscribers and their email addresses:
3) ***Incremental migrations (2 marks) -*** Create a second migrations folder and flyway command for the migrations that will occur as the code for the subscriptions database changes

4) ***Github Actions workflow (2 marks)***- make a workflow that runs both sets of flyway

migrations each time new code is pushed

5) ***Automated Tests (2 marks)***- write unittest tests to do CRUD operations on your subscriber database. Add them to the github actions. Remember that the order of tests is not specified and that each test needs to manage it's own data.

6) ***Deployment - (1 mark)*** - write something to the console from the workflow to indicate that the deployment is done.

7) Submission - (1 mark) for README.md

- A pdf with your answer to question 1
- a link to your repository in the comments**.**
- make sure that your README.md contains accurate instructions to reproduce your work