CODEBOXX

AIC-108 DevOps

Summary

The purpose of this document is to outline the requirements for Module 8 of the CodeBoxx "Smart Journey". In this module, candidates will focus on designing a real-time elevator traffic optimization system by researching and planning the use of AI tools and automation techniques to improve elevator traffic management.

Objectives

- Understand how to leverage AI tools to address complex problems
- Gain insights into various automation tools and techniques
- Develop hands-on experience with automation tools

Requirements

Rocket Elevators is experiencing long wait times for its elevators in a high-rise building with 50+ floors during peak hours. The company wants to optimize elevator traffic by implementing an AI-driven solution to direct elevators to the right floors more efficiently, reducing wait times and improving passenger satisfaction.

AI Solution Design

- Research, evaluate, and select cloud-based AI tools to design a solution that addresses the traffic optimization problem.
- Justify your choices by comparing tools, explaining their capabilities, and detailing why you selected one tool over another.
- In a document, provide clear explanations of the tools used and how they would solve the problem.
- Present your results and proposed solution in a PowerPoint, using clear visuals and concise bullet points.

Automation Plan

- Research automation tools and design a plan to automate the AI solution's processes, including data handling, model updates, and performance monitoring.
- Justify your choices, explaining how each tool contributes to continuous updates and real-time improvements.
- In a document, provide clear explanations of the tools used and their roles in the automation process.
- Visualize your strategy by incorporating your automation plan into the PowerPoint presentation using clear visuals and concise bullet points.

Presentation

Using your PowerPoint presentation, deliver a video lasting **between 5 and 10 minutes**. In the video, explain the overall design of your solution, how the different tools interact with each other, and discuss the choices you made. Emphasize how these choices will help achieve the desired outcome and why they are superior to other available options.

Bonus

It's time to put theory into practice. Complete one or more of the following tasks for bonus points (and personal knowledge). You are allowed to use tools of your choice to complete your tasks: the tools listed are suggestions.

Disclaimer: Some of the services you may consider are not free. Ensure you research and confirm whether the services you choose offer free tiers or trial periods. If any costs are incurred, it is your responsibility to manage and account for them.

1. **Use OpenTofu to Manage a Simple AWS Resource**: Leverage OpenTofu (formerly Terraform) to create and manage a basic AWS resource, such as an S3 bucket, and then delete it.
    a. Write an OpenTofu module to create an S3 bucket on AWS.
    b. Add some sample data to the bucket.
    c. Write a second module to delete the S3 bucket.
2. **Set Up a Basic CI/CD Pipeline**: Implement a basic CI/CD pipeline to automate the deployment of an AI model update to a cloud environment. **Potential Tools (non exhaustive)**: Jenkins, GitLab CI/CD, AWS CodePipeline.
    a. Create a CI/CD pipeline that builds, tests, and deploys a simple model update.

    b. Integrate the pipeline with a source code repository (e.g., GitHub) and deploy the model to a service such as SageMaker.
    c. Include steps for running tests and validating the deployment.
3. **Automate a Lamp Stack Deployment**: Automate the deployment of a LAMP (Linux, Apache, MySQL, PHP) stack to support a service.
    a. Use Ansible or Terraform to automate the setup of a LAMP stack on a cloud instance.
    b. Ensure that the stack is properly configured and secured.
    c. Test that a simple PHP application can interact with the MySQL database.
4. **Automate Deployment of a Simple Web Service**: Automate the deployment of a basic web service that could be used as a dashboard or control interface for the elevator traffic optimization system. **Potential Tools (non exhaustive)**: Docker, Kubernetes, AWS Elastic Beanstalk, Terraform, CloudFormation.
    a. Define a Terraform or CloudFormation template to deploy an environment that includes an S3 bucket, an RDS database, an EC2 instance for a web server, and any necessary networking components.
    b. Ensure that the template is modular and can be easily adapted for different environments.

Deliverables

A text file containing

- Your full name
- A link to your **PRIVATE** GitHub repository (**Make sure you add your coaches as collaborators prior to submitting**), containing:
    - Your research document
    - Your PowerPoint presentation
    - A link to your presentation video (must be publicly available)