**CCGC – 5001**

**Virtualization**

# **MyNote Application with Django and MySQL**

Project Report

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**Submitted By:**

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# PROJECT INTRODUCTION

MyNote App is a web application for notetaking, emphasizing user security and responsive design. Leveraging the power of Django, MySQL, and an intuitive user interface, this project offered features such as user authentication, creating and editing notes, deleting notes, viewing detailed note information, and ensuring a responsive design for diverse screen sizes.

The goal of this project was to design and develop a Note Taking app with a flexible Continuous Integration/Continuous Deployment (CI/CD) pipeline using GitLab, Docker, AWS EC2 machines.

The CI/CD pipeline was designed to automate the process of building, testing, and deploying the application to a production environment. Docker was used to create images, docker compose to containerize the app, make it easily deployable across different environments that is hosted on AWS EC2 machine.

## PROJECT KEYS AND FEATURE

# The main objectives of this project were to design and develop a Note app that provides the following functionalities:

1. **User Authentication:**

**Users can securely sign up, log in, and log out.**

**User credentials are stored securely in MySQL database.**

The MyNote App features a user authentication system, enabling user sign-ups, log-ins, and log-outs. During sign-up, user details are validated, and passwords are securely stored in the MySQL database. The login process employs Django's authentication system where the credentials are validated with the data stored in the MySQL database. Once logged in, users can access detailed information about each note they have created in the application. Upon logout, user sessions are effectively terminated.

1. **Create Notes:**

**Users can easily add new notes, including titles and descriptions.**

**A user-friendly interface simplifies the note creation process.**

In the MyNote App, users can effortlessly add new notes through a user-friendly interface. This feature includes a form where users can input titles and descriptions for their notes. On the backend, Django handles the data, ensuring secure and efficient storage in the MySQL database.

1. **Edit Notes:**

**Users have the flexibility to update and modify their existing notes.**

In the MyNote App, users are provided with the flexibility to update and modify their existing notes. This feature allows for easy editing of note contents, including titles and descriptions, ensuring that users can keep their notes current and relevant. Each change is updated and stored in the MySQL database.

1. **Delete Notes:**

**Unwanted notes can be deleted effortlessly.**

The MyNote App offers a straightforward and efficient way for users to delete unwanted notes. With just a few simple clicks, users can permanently remove any note they no longer need. And is securely removed from the database.

1. **View Note Details:**

**Users can access detailed information about each note.**

The MyNote App provides users with the capability to access detailed information about each of their notes. This feature allows users to view details such as the creation date, last modified date, title, and description associated with the note.

## TECHNOLOGY STACK

**Backend Framework:**

Django, a Python web framework, serves as the backend to facilitate user authentication, note management, and data security.

**Database:**

MySQL, a reliable and widely used open-source relational database, employed to ensure data integrity and efficient storage.

**Frontend:**

The user-friendly interface was developed using HTML, Bootstrap, CSS, and JavaScript.

## IMPLEMENTATION AND DEVELOPMENT

The Note app was developed using the Django framework as backend. MySQL was used as the database, where the application is hosted on EC2 Machine, an AWS cloud-based service. GitLab was used for version control, and Docker was used to build an image and containerize the app, allowing it to be deployed easily across different environments, and deployed on AWS.

A diagram of a docker

Description automatically generatedFIG:1 Project Implementation

How each implementation works in project:

**Django, serving as the backend framework,** is pivotal in the architecture of the MyNote App. As a high-level Python web framework, Django is renowned for its rapid development capabilities and clean, pragmatic design. It manages crucial backend tasks like URL routing, database interactions, and security. A standout feature of Django is its ORM (Object-Relational Mapping), which simplifies database queries and operations, allowing developers to interact with the database using Python code instead of SQL. This, combined with its built-in admin panel and user authentication handling, makes Django an ideal choice for building the core functionalities of the MyNote App.

**MySQL, as the database system,** plays a critical role in data management for the application. This open-source relational database is chosen for its proven reliability, scalability, and performance. MySQL handles the storage and retrieval of all application data, including user credentials and notes. It ensures data integrity and provides efficient data storage solutions, crucial for maintaining the application's performance and security.

**The frontend of the MyNote App** is developed using a combination **of HTML, CSS, JavaScript, and Bootstrap**. HTML structures the content of the web pages, while CSS adds styling to make the interface aesthetically pleasing and user-friendly. JavaScript introduces dynamic elements and interactivity to the web pages, enhancing the user experience. Bootstrap, a powerful front-end framework, is employed for its responsive design features, ensuring that the application is accessible and functional across various devices and screen sizes.

**GitLab is utilized for version control and as part of the CI/CD pipeline.** It provides a robust platform for managing the source code, tracking changes, and facilitating collaboration among developers. Its CI/CD capabilities are integral to the automated testing, building, and deployment processes of the MyNote App. This automation ensures that new code changes are seamlessly integrated, and that the application remains stable and efficient throughout development cycles.

**Docker's role in the project is centered around containerization**. By packaging the application and its dependencies into virtual containers, Docker guarantees consistency across different development, testing, and production environments. This isolation of the application from its underlying system aids in eliminating the 'it works on my machine' problem, making deployments more reliable and scalable.

Finally, **the application is hosted on AWS EC2,** which is part of Amazon's cloud computing platform. EC2 provides the necessary infrastructure and computing resources, offering scalability and flexibility. It accommodates the app's varying load, ensuring optimal performance and availability. The integration of EC2 in the project underscores the commitment to a robust and scalable cloud-based hosting solution.

## SUMMARY

The MyNote App leverages these technologies to create a comprehensive, secure, and user-friendly note-taking application. From Django's backend prowess to AWS EC2's hosting capabilities, each technology is carefully selected and integrated to ensure the application's effectiveness and efficiency.

## CHALLENGES

## CONCLUSION AND FUTURE WORK

## CITATIONS/REFERENCES: