A

PROJECT REPORT

ON

Social Media WebApp

Submitted in partial fulfilment of the requirements

of the degree of

Bachelor of Engineering In Information Technology

by

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Supervisor(s):

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Department of Information Technology

K.C. College of Engineering and Management Studies And Research, Thane (E)

University of Mumbai

2023-24

CERTIFICATE

This is to certify that the project entitled **"Social Media WebApp"** is a bonafide work of "**Yash Patil, Sairaj Pai, Nandini Nichite" (42, 35, 34)** submitted to the University of Mumbai in partial fulfillment of

the requirement for the award of the degree of **"Bachelor of Engineering"** in **"Information Technology"**.

Name and sign
Supervisor/Guide

Name and sign
Co Supervisor/Guide

Prof.Amarja Adgaonkar
Head of Department

Dr.Vilas Nitnaware
Principal

Project Report Approval for S.E.

This project report entitled **Social Media WebApp** by ***Yash Patil, Sairaj Pai, Nandini Nichite*** is approved for the degree of Bachelor of Engineering in **Information Technology.**

Examiners

1.----------

2.----------

Date:

Place: Thane

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Yash Patil - 42

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Sairaj Pai - 35

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Nandini Nichite - 34

Date:

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Yash Patil - 42

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Sairaj Pai - 35

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Nandini Nichite - 34

Date:

ACKNOWLEDGEMENT

We would like to express special thanks to our guide **Asst Prof. Punam Bagul** who gave us the golden opportunity to do this wonderful project on the topic of **Social Media WebApp**, which also helped us in doing a lot of research and we came to know about so many new things. We are very grateful to our Head of the Department **Mrs.Amarja Adgaonkar** for extending her help directly and indirectly through various channels in our project work**.** We would also like to thank Principal **Dr. Vilas Nitnaware** for providing us the opportunity to implement our project. We are really thankful to them. Finally we would also like to thank our parents and friends who helped us a lot in finalizing this project within the limited time frame.

Thanking You.

TABLE OF CONTENT

Sr.No. Topic Page No.

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

The Social Media App, developed using Python with Flask offers a comprehensive platform for users to create and manage their accounts, log in and access personalized content, post updates and share thoughts, and engage in discussions by commenting on posts. The application showcases a robust user authentication system, complete with user registration, login, and logout functionality, ensuring secure access. Additionally, the CRUD operations for posts enable users to create, read, update, and delete their own posts, while the commenting feature allows for interactive conversations. The application also employs best practices in database management and design patterns, ensuring efficient data storage and retrieval. Overall, this project showcases proficiency in web development, database management, user interaction design, and software engineering principles, demonstrating a scalable and maintainable web application.

At its core, OpenMedia prioritizes security, deploying Flask-Login for authentication, while employing advanced password hashing techniques using SHA-256, and enabling SMTP-based password reset functionality.

OpenMedia stands out with its innovative multimedia management capabilities, seamlessly integrating Cloudinary for effortless image uploading, serving, and management. Complemented by Bootstrap's responsive design and JavaScript's dynamic prowess, the frontend promises an intuitive and engaging user experience.

ACKNOWLEDGMENTS

Completing this project has been a rewarding journey, and it is essential to express our heartfelt appreciation to those whose support and guidance made it all possible. We are honored to extend our sincere gratitude to the esteemed **Dr. Vilas Nitnaware, the Principal of KCCEMSR**, for his unwavering encouragement that fueled our efforts. Special thanks are due to **Prof. Amarja Adgaonkar, the Head of the IT department**, whose valuable insights and counsel shaped the project's success. We would also like to convey our deep appreciation to our internal project mentor, **Asst. Prof. Punam Bagul**, whose continuous support and expert guidance were the guiding light throughout our project's duration. It is with immense gratitude that we acknowledge their pivotal roles in making this project a reality.

INTRODUCTION

This chapter gives an overview about aim, objectives, motivation and problem statement of the project.

1.1 INTRODUCTION

- Social media is digital technology that allows the sharing of ideas and information, including text and visuals, through virtual networks and communities.
- Social media typically features user-generated content that lends itself to engagement via likes, shares, comments, and discussion.
- Enhancing digital connectivity and fostering meaningful interactions among users.
- Customizable profiles for personalized online identities.
- Integrated instant messaging for private conversations.
- Group chat functionalities for community engagement.
- Users have the freedom to create profiles that reflect their personality, interests, and aspirations, allowing for a personalized online presence.

1.2. MOTIVATION

- **Connecting People Globally**: In today's digital age, people are more connected than ever, yet there is a growing need for platforms that foster genuine, meaningful connections.

- **Promoting Creativity and Expression**: We believe that everyone has a unique voice and perspective to share.

- **Empowering Users with Knowledge and Information**: In an age of information overload, it's essential to have a platform that curates and delivers relevant content to users.

- **Enhancing Real-world Connections**: While digital connections are valuable, our app also aims to enhance real-world connections by facilitating meetups, events, and group activities based on shared interests and locations.

- **Privacy and Security**: With growing concerns about data privacy and security breaches, our motivation is to provide a platform that prioritizes user privacy and security.

- **Professional Development:** Developing OpenMedia could serve as a valuable learning opportunity for us, allowing us to enhance our skills in software development, database management, security practices, and more.

- **Contributing to the Community:** By creating OpenMedia(A social media WebApp) as an open-source project, we can contribute to the broader developer community, providing a valuable tool that others can use, customize, and improve upon.

- **Exploring New Technologies:** Building OpenMedia provides us with an opportunity to experiment with and learn about cutting-edge technologies, frameworks, and tools relevant to web development, cloud computing, and data management

1.3 PROBLEM STATEMENT

- The problem statement is **Building a social media app with intuitive and user friendly UI for users and social media owners with seamless experience.**

OBJECTIVES

- Social media are interactive, computer-mediated technologies that facilitate the creation or sharing of information, ideas, career interests, and other forms of expression via virtual communities and networks.

- Social Media is the form of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (such as gifs, images).

- Aim to organize meetups, events, and group activities based on shared interests and locations to strengthen real-world relationships.

- Facilitate interactive discussions by allowing users to comment on posts, reply to comments, and engage in conversations.

- Create user profiles that showcase personal information, activity history, within the platform.

- Ensure that the web app is accessible to users with disabilities and responsive across various devices and screen sizes.

- Design the application architecture to handle a large volume of users and data efficiently, optimizing performance and scalability.

1.4 ORGANIZATION OF REPORT

The report is divided into 3 parts explaining the project.

- The first chapter gives the introduction of the project as well as our motivation behind selecting the project as well as the problem statement of the project.

- The second chapter gives the overview on the literature survey conducted by the team.

- Survey of existing system, limitations of literature survey and the implementation plan of the project are also explained in the chapter

- Final chapter explains the framework on which the project is made as well as shows outputs of our project.

- Finally, we have the page elaborating the conclusion and future scope of the project.

1.5 ABBREVIATIONS

- SNS: Social Networking Service (a general term for social media platforms like Facebook, Twitter, etc.)
- UI/UX: User Interface/User Experience (design elements and user interaction, like layout, buttons, and navigation)
- API: Application Programming Interface (integration with other systems or services, like sharing content to Twitter or Facebook)
- DB: Database (storing and managing user data, like profiles, posts, and comments)
- FE: Front-End (client-side development, like HTML, CSS, and JavaScript, which runs in the user's web browser)
- BE: Back-End (server-side development, like Python, Ruby, or Java, which runs on the server and handles data storage and processing)
- SQL: Structured Query Language

2. LITERATURE SURVEY

Year	Title of the paper	Methodology Used	Advantages	Limitations and challenges
2023	"Navigating the Social Media Landscape: Opportunities, Challenges, and Implications Across Sectors"	Social media has revolutionized communication, transforming how individuals and businesses interact with digital content. Platforms like Twitter, Instagram, and Facebook have not only reshaped entertainment but also impacted sectors like education, politics, and journalism. As organizations aim to harness its power, understanding social media nuances becomes crucial. Research delves into audience engagement, content dissemination, and platform dynamics, offering insights into best practices and user behavior. This discourse highlights social media's profound impact on modern communication, emphasizing the need for ongoing exploration and adaptation. Leveraging insights from this research can inform strategic decision-making and enhance user experiences in the digital era.	Integrating social media into various sectors offers several advantages. First, it enhances communication by providing unprecedented opportunities for interaction and content creation. Second, it fosters engagement, allowing organizations to connect with audiences in real-time. Third, it facilitates content dissemination, enabling information to reach broader audiences quickly. Fourth, it promotes user-generated content, encouraging active participation and collaboration. Overall, social media's transformative impact on modern communication underscores its value in	Despite its advantages, integrating social media into various sectors also presents challenges. First, managing and navigating the social media landscape can be complex and time-consuming. Second, ensuring privacy and data security remains a significant concern, potentially impacting user trust and engagement. Third, the rapid spread of misinformation on these platforms can lead to misinformation and public confusion. Fourth, not all audiences may have

			shaping narratives, fostering engagement, and driving change across different domains.	equal access to social media platforms, creating potential disparities in information dissemination. Lastly, maintaining a consistent and positive brand image amidst diverse user-generated content can be challenging for organizations.
2021	"Social Media in Education: Opportunities and Challenges for Learning Enhancement"	Social media platforms have become integral to people's lives, especially among the youth who use devices like smartphones and tablets to engage with these platforms regularly. These platforms facilitate communication, information sharing, and content creation across various formats, including blogs, micro-blogs, and video-sharing sites. They have a significant impact across different sectors, such as business, healthcare, education, and society at large. This paper explores the influence of social media on various domains, discussing popular platforms like Facebook, Twitter,	In the realm of social media's impact on education, platforms like Facebook and Twitter offer valuable opportunities for collaborative learning and knowledge exchange among students and educators alike. These platforms enable real-time communication, facilitate resource sharing, and foster community engagement, enhancing learning experiences beyond	Despite the benefits, integrating social media into education also presents challenges. Concerns around privacy and data security may arise, as students' personal information and interactions are exposed online. Additionally, the potential for distraction and misuse of social media during learning activities

		YouTube, and Instagram. It examines both the positive and negative effects of social media, providing insights into managing challenges and concluding with recommendations for effective social media usage.	traditional classroom settings. Additionally, social media use in education promotes digital literacy skills and prepares students for the interconnected digital world they will navigate in their future careers.	can impede academic focus and productivity. Furthermore, not all students have equal access to technology or reliable internet connections, creating disparities in participation and learning outcomes.
2015	"Social Media in Economics Education: Opportunities, Challenges, and Student Perspectives"	Excerpt of the paper : Economics educators are increasingly exploring the potential of social media to engage students both inside and outside the classroom, a trend relevant to projects like OpenMedia. While initial research has focused on Marketing and Management courses, there's growing interest in using social media as an active learning tool in economics education. However, concerns about student privacy emerge as a significant issue that could impact its effectiveness. This paper investigates students' perspectives on using social media for educational purposes in economics classrooms, examining the platforms they use, engagement frequency, and associated concerns.	Integrating social media into economics education offers several advantages. First, it enhances student engagement by making learning more interactive and relatable. Second, it serves as an active learning tool, allowing students to participate and collaborate in real-time. Third, it brings real-world relevance to the classroom, helping students connect economic concepts to current digital trends. Lastly, it broadens the scope of teaching methods, catering to	Despite the benefits, integrating social media into economics education also presents some limitations. First, concerns about student privacy can hinder its adoption, potentially compromising the effectiveness of its use as a learning tool. Second, managing and moderating online interactions can be time-consuming for educators. Third, not all students may have

		Understanding these dynamics can help educators enhance student engagement and learning while addressing privacy issues.	diverse learning styles. Nonetheless, addressing privacy concerns is crucial to ensure ethical and effective use of these platforms in education.	equal access to social media platforms, leading to potential disparities in learning experiences. Lastly, the use of social media may distract students from the primary learning objectives if not properly managed.
2014	"Navigating the Social Media Landscape in Software Development"	In the realm of software development, social media platforms have become integral tools for communication, learning, and collaboration, shaping a new breed of professionals known as social programmers. This paper explores the historical evolution, current trends, and future prospects of social media in software development, aligning with the goals of the OpenMedia project. Through a detailed review and insights from a large-scale developer survey, we examine the diverse use of media channels and communication patterns in the field. While social media offers significant benefits, traditional face-to-face interactions remain crucial. By synthesizing	Social media platforms have significantly impacted software development by offering developers efficient communication channels for collaboration and teamwork. These platforms serve as rich repositories of industry insights, providing developers with valuable resources to enhance their skills and knowledge. Furthermore, they create avenues for networking, connecting developers with peers, mentors, and experts in the industry. Additionally, by	Within the software development landscape, utilizing social media introduces certain complexities. The sheer volume of available content can be daunting, complicating the task of filtering and identifying pertinent information. Additionally, the potential risk of disclosing sensitive or proprietary information on public platforms raises concerns about

		historical analysis and survey data, we propose a roadmap for future research, suggesting that social media could lead to a paradigm shift in software development methodologies, resonating with the ethos of OpenMedia.	promoting open-source contributions and fostering creative problem-solving, social media accelerates innovation and drives progress in software development.	data security and intellectual property protection. Maintaining the integrity and reliability of shared content presents its own set of challenges, increasing the risk of misinformation dissemination. Moreover, the time and effort required to manage various social media interactions can detract from core development activities, affecting overall efficiency.

2.1 SURVEY OF EXISTING SYSTEM

While surveying the existing state of the social media app,

- Identify the strengths and weaknesses of current systems
- Determine how well they meet the needs of users and stakeholders
- Evaluate their efficiency, effectiveness, and scalability
- Identify areas for improvement, consolidation, or replacement
- Inform the design and development of new systems or modifications to existing ones.

2.2 LIMITATIONS OF EXISTING SYSTEM

- **Privacy Concerns:** Despite efforts to ensure user privacy, social media apps can still be vulnerable to data breaches and unauthorized access, raising concerns about the safety and security of user data.
- **Information Overload:** The constant stream of information and content on social media can be overwhelming, leading to information overload and difficulty in filtering out irrelevant or low-quality content.
- **Fake news and MisInformation:** Social media platforms can be breeding grounds for the spread of fake news and misinformation, which can have serious implications on public opinion, societal beliefs, and even political outcomes.
- **Cyberbullying and Harassment:** The anonymity and accessibility of social media can sometimes lead to cyberbullying, harassment, and online trolling, creating a negative and hostile environment for users.
- **Platform Dependence**: Users may become too dependent on a single social media platform for communication, entertainment, and information, limiting their exposure to a broader range of experiences and perspectives.
- **Closed Source:** The existing systems are not open source and if they are, they are not scalable upto production level.
- **Costly Deployment Requirements:** Existing systems require dedicated bare metal servers along with a large database. They also require additional resources like S3 object storages to store files. This all generates additional cost overhead.

2.3 MINI PROJECT IMPLEMENTATION PLAN

- We started by improving upon the shortcomings of the existing system and implementing those improvements accordingly in the application.
  Improvements include :
  - ➢ Ensuring lite-weight and minimal implementation for deployment on low end machines.
  - ➢ Ensuring proper documentations for building and deployment.
  - ➢ Dedicated server to store and retrieve orders from database to ensure 24x7 service of our platform.
  - ➢ Authentication and authorization libraries like Flask-Login.
  - ➢ Dependency management tools like pip to ensure up-to-date packages and avoid known vulnerabilities.

The project was divided into 3 parts with
Yash Patil - Designed Schema Design, Database Connection, Database to Python Objects ORM Mapping, Backend, Deployment, Encryption/Hashing.
Sairaj Pai - Front-end, Backend, Forms and input validation, quality assurance, testing, Frontend design.

Nandini Nichite - Documentation, Frontend, Security, input validation, testing, Frontend design.

We divided the tasks amongst us and had set deadlines to complete the certain code blocks at a given amount of time. With that, the GUI aspects were done simultaneously by every member of the team.

2.4 ADVANTAGES

- **Connectivity:** staying connected with friends, family, and like minded individuals
- **Content sharing:** sharing updates, ideas, and creative content
- **Networking:** professional and personal networking opportunities
- **Discovery:** discovering new ideas, trends, and interests
- **Feedback and support:** getting feedback and support from others
- **Entertainment:** accessing various types of entertainment content
- **Education:** accessing educational resources and information
- **Marketing and advertising:** reaching a wider audience for businesses and organizations.
- **Scalability:** The app is designed to scale according to the needs of users and organizations, supporting the management of large volumes of media assets without compromising performance or stability.
- **Cost-Effectiveness:** As an open-source project, our app offers a cost-effective solution for individuals and organizations seeking to streamline their content management workflows without incurring hefty licensing fees or subscription costs.
- **Future Expansion and Development:** With an active development roadmap and ongoing updates, our social media app is poised for continuous improvement and expansion, ensuring that it remains a relevant and valuable solution for users in the long term.

2.5 DISADVANTAGES

- **Privacy concerns**: safeguarding personal information against data breaches and unauthorized use
- **Addiction**: monitoring usage to prevent excessive screen time and its negative impact on well-being
- **Cyberbullying**: implementing measures to combat harassment, trolling, and online aggression
- **Misinformation**: promoting fact-checking and credible sources to counter false or misleading information

- **Comparison and envy**: encouraging positive self-image and healthy social interactions
- Social isolation: facilitating a balance between online and offline connections to prevent isolation
- **Dependency on Third-Party Services:** OpenMedia relies on third-party services such as Cloudinary for media hosting and delivery. Any disruptions or changes to these services could impact the functionality and availability of OpenMedia, potentially causing downtime or data loss.
- **Resource Consumption:** Depending on the size and complexity of the media assets being managed, OpenMedia may consume significant server resources such as CPU, memory, and bandwidth, leading to increased hosting costs or performance degradation.
- **Community Support Dependency:** While the open-source nature of OpenMedia fosters community support and collaboration, there may be reliance on the community for resolving issues, providing updates, or addressing feature requests, which could lead to delays or limitations in addressing user needs.

3. PROPOSED SYSTEM

3.1 INTRODUCTION

Introducing OpenMedia: Revolutionizing Social Media WebApp

In today's digital landscape, social media has become an integral part of our daily lives, connecting people, ideas, and experiences like never before. Welcome to OpenMedia, a dynamic Python Flask application poised to revolutionize the social media experience.

OpenMedia isn't just another social networking platform; it's a vibrant community hub designed to foster meaningful connections, facilitate engaging conversations, and inspire creativity. Whether you're sharing moments with friends, discovering new interests, or expressing yourself through multimedia content, OpenMedia offers a platform where every voice is heard and every story is celebrated.

- The project is a full stack application which uses Python Flask, SQLAlchemy ORM, PostgreSQL, HTML/CSS, JavaScript, Cloudinary as tech stack

- The application has the following features :
  1. Users can like, post,comment on the Web Page Of the application.
  2. This application is very lightweight and can be run on any minimal computer hardware.
  3. User Authentication with focus on security as the password is encrypted using industry standard encryption techniques.
  4. Users can create various types of posts, including text, images, gifs which can be liked and commented upon by other users.

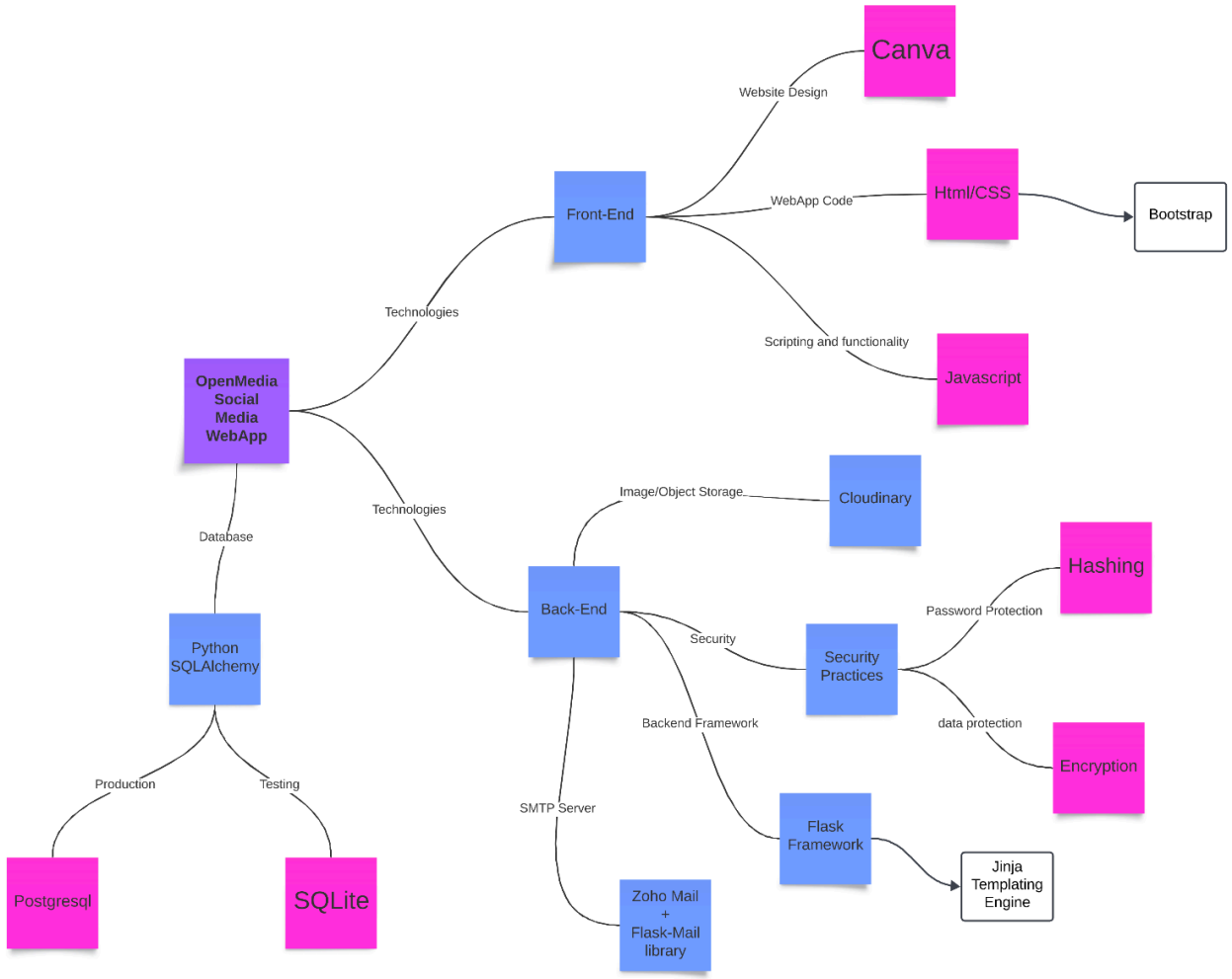
- Keeping the privacy in mind, only the management can access the user information' list as it is behind a login page protected by a password.

- It is fast, accurate and visually appealing.

- OpenMedia has dark and light modes, ensuring a good user experience for users using at night times.

3.2 ARCHITECTURE/FRAMEWORK

Comprehensive Mind Map of Technologies used to build the project:



Mind Map Of Technologies Used

- **Backend:**

1. **Flask Framework:**

   - Use Flask to build the web application backend.

2. **SQLAlchemy ORM:**

   - Integrate SQLAlchemy for database operations.

- Define models for users and posts, and establish relationships between them.

3. **PostgreSQL Database:**

- Utilize PostgreSQL as the database backend for storing user information, posts, and other data.

4. **Flask-Login:**

- Implement Flask-Login for user authentication and session management.

- Users can log in, log out, and maintain their session securely.

5. **Password Hashing:**

- Use SHA-256 hashing algorithm along with salting to securely hash user passwords before storing them in the database.

- Utilize libraries like Passlib for this purpose.

6. **Reset Password Emails:**

- Implement functionality to send reset password emails using SMTP server.

- Use Flask-Mail or similar libraries for sending emails securely.

7. **Cloudinary Integration:**

- Allow users to upload pictures to Cloudinary.

- Utilize Cloudinary's Python SDK to upload, serve, and manage images directly from Cloudinary's cloud storage.

8. **HTTPS and Security Practices:**

- Host the Flask app on a production server with HTTPS enabled to ensure data transmission security.

- Implement security best practices such as input validation, CSRF protection, and session management to prevent common web vulnerabilities like XSS and CSRF attacks.

- **Frontend:**

1. Bootstrap Framework:

- Utilize Bootstrap for responsive and mobile-first frontend design.

- Use pre-styled components and layouts for building a visually appealing interface.

2. JavaScript:

- Add interactivity and dynamic functionality to the frontend.

- Implement features such as form validation, AJAX requests, and DOM manipulation.

- **Deployment:**

1. Production Server Deployment (deta.space):

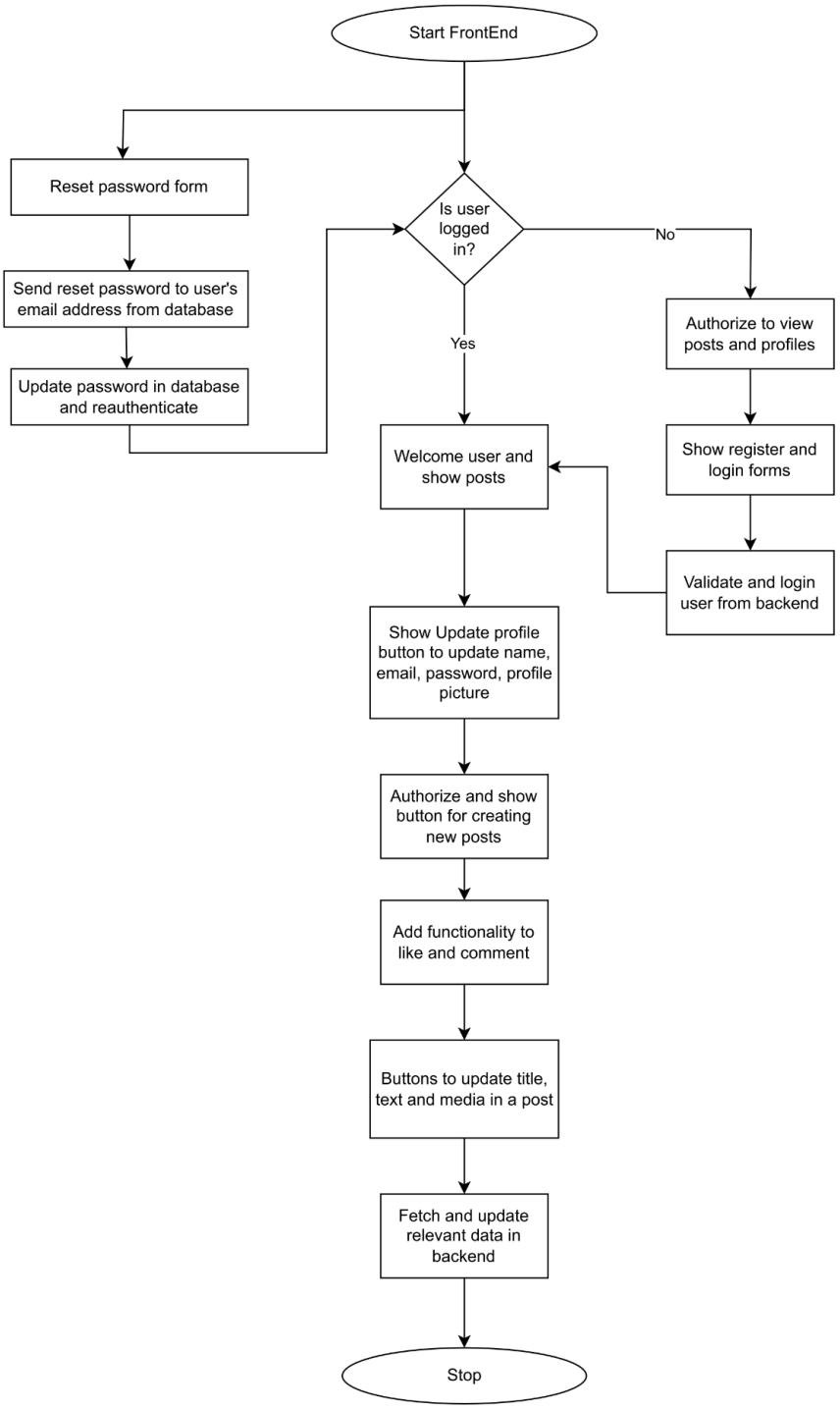
- Deploy the Flask app on a production server using platforms like https://deta.space/.

- Configure server settings for optimal performance, security, and scalability.

3.3 FLOW CHART & ALGORITHM

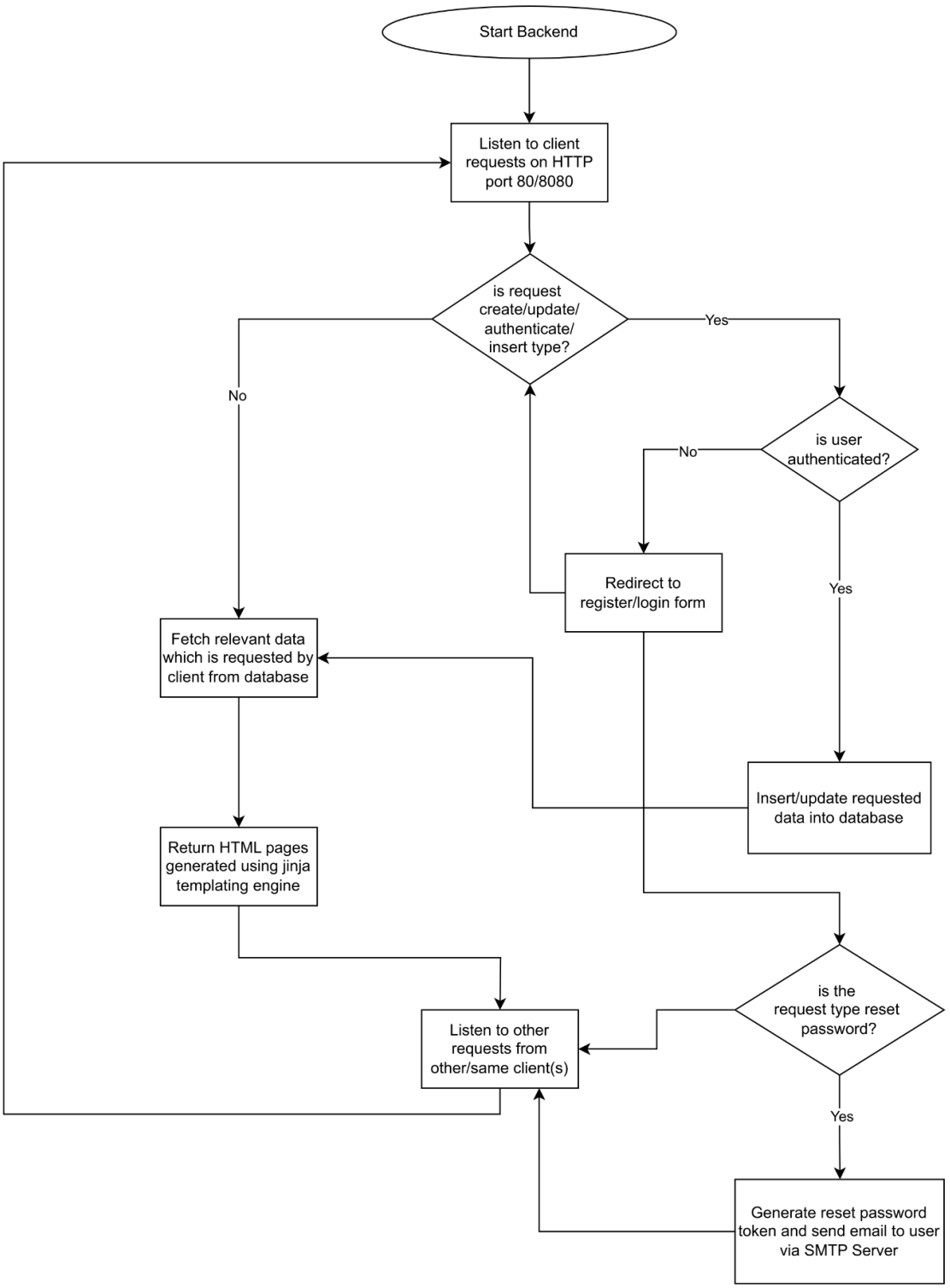
The project can be understood by various visual representations and diagrams given below:

1. **Frontend Flowchart:**



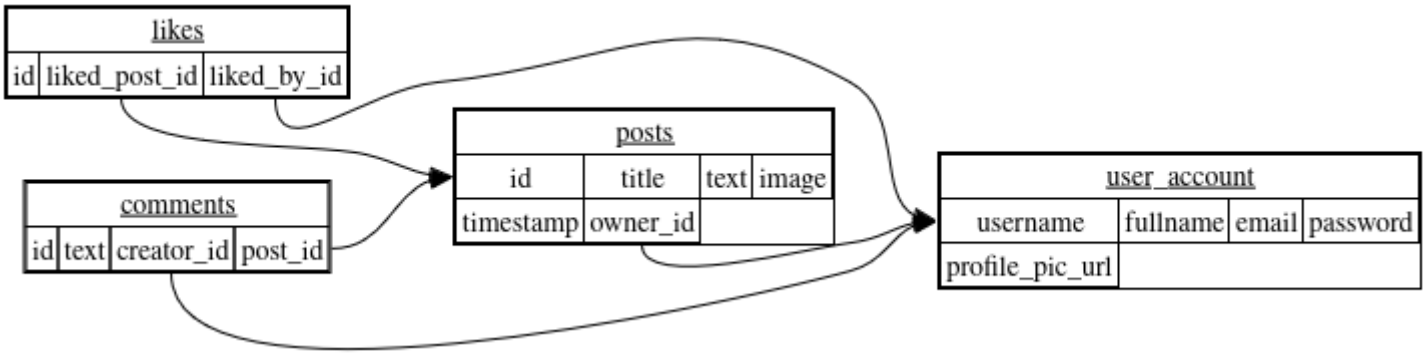
Frontend Flowchart

2. Backend Flowchart:



Backend Flowchart

3. **Database Design Schema Visual Representation:**



Database Schema Diagram

3.5 OPERATION ENVIRONMENT

Hardware requirement-

I. Operating System: Linux Server with python version 3.11.5+ and pip installed

II. High-speed internet connection

III. MultiCore (4+ cores) CPU with at least 20GB of free storage space

IV. RAM - 2GB

Software Requirement-

I. Backend: Python Flask v2.0 along with other libraries in requirements.txt

II. SQLAlchemy: Python Database to Object ORM Mapping library

III. Frontend: Python 3.8 or higher and Framework: Flask

IV. Web Browser (Chrome/Safari/Firefox or other) at its latest version.

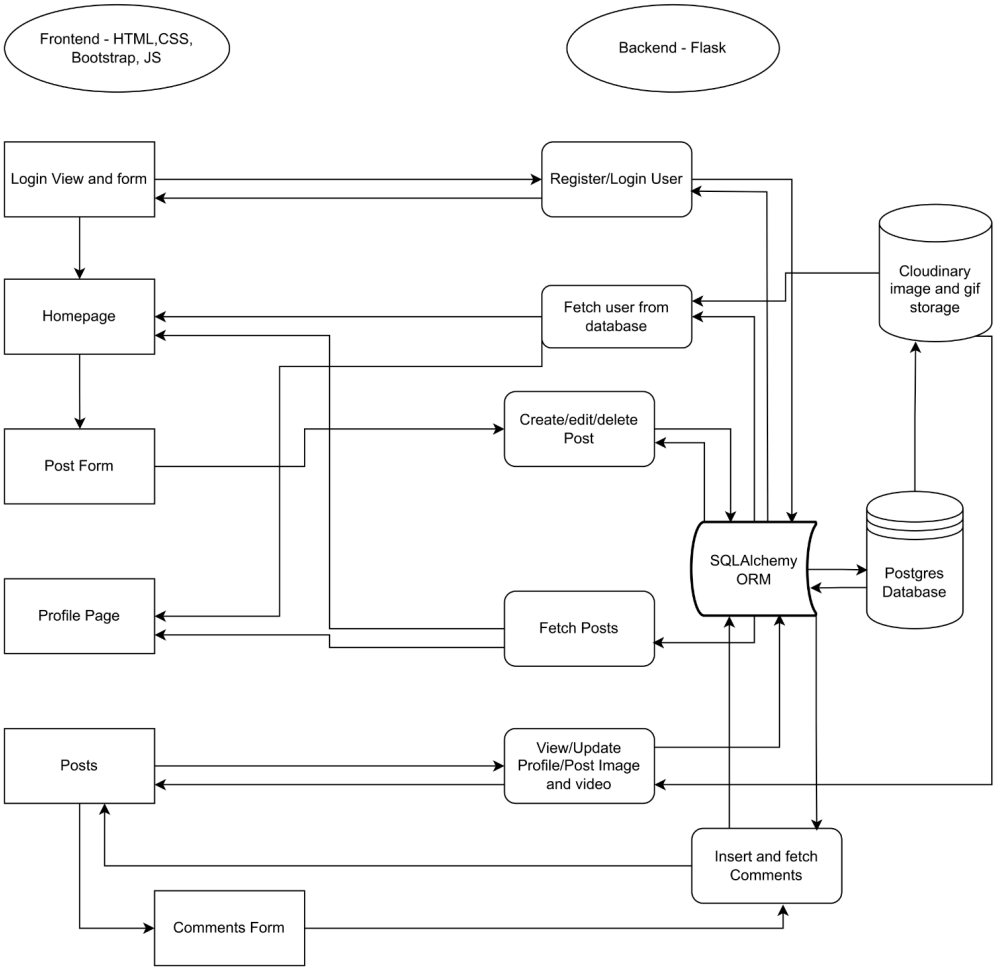
V. Database Software: PostgreSQL installed and configured on the server for storing and managing application data securely.

VI. Python Modules : Modules like flask-login, flask-mail, cloudinary, pytz are required if the application is to be run on a local machine.

3.5 EXPERIMENT AND RESULTS

The current flow is -

DataFlow Diagram (DFD):



Data Flow Diagram

The code is extremely modular (consists of multiple classes and files as required), encapsulated and built with future improvements in mind. Adding new posts, comments, likes is extremely easy to implement due to modularity.

Incorporating Jinja templating in OpenMedia ensures code reusability by allowing developers to create modular, dynamic templates for consistent UI elements across the application. With Jinja, common components like headers, footers, and navigation menus can be defined once and reused throughout the project, promoting maintainability and reducing redundancy in code. Additionally, Jinja's support for template inheritance facilitates efficient updates and modifications, enabling developers to adapt the application's UI seamlessly as requirements evolve.

Utilizing SQLAlchemy in OpenMedia enhances code reusability by providing a robust ORM framework for interacting with the database. By defining database models and relationships in Python classes, developers can create reusable components for accessing and manipulating data throughout the application. SQLAlchemy's query API allows for the creation of modular, parameterized queries, promoting efficient and scalable database interactions. Additionally, SQLAlchemy's declarative syntax simplifies database schema management and migration tasks, facilitating seamless updates and modifications as the project evolves.

CODE SNIPPETS:

The project has all the functions split into individual files and the code has been made accessible to read in simpler terms.
Here are some of the snippets :

1. Hashing

```
@app.route( rule: "/register", methods=['GET', 'POST'])
def register():
    if current_user.is_authenticated:
        return redirect(url_for('home'))
    form = LoginForm()

    form = RegistrationForm()
    if form.validate_on_submit():
        hashed_password = hashlib.sha256((form.password.data + salt).encode('utf-8')).hexdigest()
        user = User(
            username=form.username.data,
            fullname=form.fullname.data,
            email=form.email.data,
            password=hashed_password
        )
        db.session.add(user)
        db.session.commit()
        flash( message: f'Account created for {form.username.data}! Go Login Now !', category: 'success')
        return redirect(url_for('home'))
    return render_template( template_name_or_list: 'register.html', title='Register', form=form)
```

2. Requirements are specified in a separate text file, indicating what modules are needed for Openmedia to run on individuals' machines.

requirements.txt

```
flask
flask_wtf
Flask-SQLAlchemy
flask-login
flask-uploads
wtforms
SQLAlchemy
email-validator
pytz
cloudinary
Flask-Mail
Pillow
```

3. Database Creation using SQLAlchemy

models.py

```python
class User(Base, UserMixin): # pylint: disable=too-few-public-methods
    """
    The User class whose object represents a user of app, user_account table
    """
    __tablename__ = "user_account"

    username: Mapped[str] = mapped_column(primary_key=True)
    fullname: Mapped[str] = mapped_column(nullable=False)
    email: Mapped[str] = mapped_column(nullable=False, unique=True)
    password: Mapped[str] = mapped_column(nullable=False)
    profile_pic_url: Mapped[Optional[str]] = mapped_column(default="user.png")
    posts: Mapped[List["Posts"]] = relationship(back_populates="owner")

    def __str__(self) -> str:
        return (
            f"\nUsername: {self.username}"
            f"\nEmail: {self.email}"
            f"\nPassword: {self.password}"
            f"\nName: {self.fullname}"
            f"\nProfile pic: {self.username}"
        )

    def get_id(self):
        return self.username


12 usages
class Likes(Base):...


17 usages
class Posts(Base):...


4 usages
class Comments(Base):...
```

4. File Uploading snippet

fileupload.py

```python
import cloudinary
from cloudinary import CloudinaryImage
import cloudinary.uploader
import cloudinary.api
from os import environ

cloudinary.config(
  cloud_name = environ.get("CLOUDINARY_NAME"),
  api_key = environ.get("CLOUDINARY_KEY"),
  api_secret = environ.get("CLOUDINARY_SECRET"),
  secure=True
)


6 usages
def upload_image(file_object, filename):
    cloudinary.uploader.upload(file_object,
                               public_id=filename,
                               unique_filename=False,
                               overwrite=True)
    src_url = CloudinaryImage(filename).build_url()
    print(src_url)
    return src_url


3 usages
def delete_image(filename):
    cloudinary.uploader.destroy(filename)

```

5. Snippet demonstrating how the macros section of the code works.

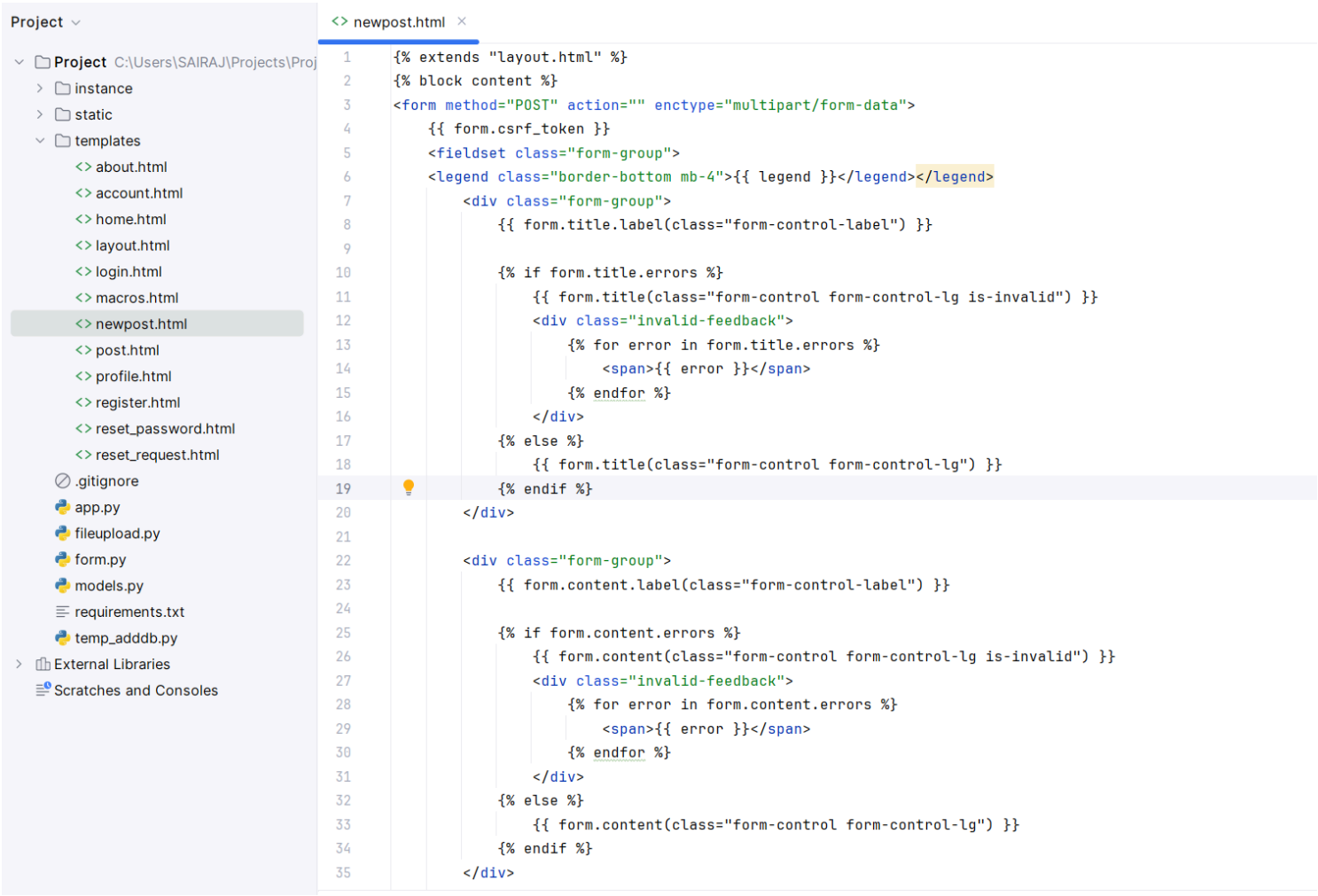
macros.html

```jinja
{% macro render_post(post, datetime, tz) -%}
    <div class="media-body">
        <div class="article-metadata">
            <div>
                {% if post.owner.profile_pic_url == "user.png" %}
                    <img class="mb-1 me-1 invertOnDark" src="{{ url_for('static', filename='user.png') }}" alt="{{ post.owner.fullname }} profile picture" width="35px">
                {% else %}
                    <img class="mb-1 me-1 rounded-circle" src="{{ post.owner.profile_pic_url }}" alt="{{ post.owner.fullname }} profile picture" width="35px">
                {% endif %}
                <a class="text-decoration-none me-3" href="{{ url_for('profile', username=post.owner.username) }}">{{ post.owner.fullname }}</a>
            </div>
        </div>
        <h2><a class="article-title text-decoration-none" href="{{ url_for('post',post_id=post.id) }}">{{ post.title }}</a></h2>
        <p class="article-content">{{ post.text }}</p>
        {% if post.image %}
            <img class="card-img-bottom mb-3" src="{{ post.image }}" alt="Card image cap">
        {% endif %}

        <div class="mb-1 d-flex flex-row-reverse">
            <small class="text-muted pb-1 border p-1" style="...">{{ datetime.fromtimestamp(post.timestamp, tz=tz).strftime('%d/%m/%Y %I:%M %p') }}</small>
        </div>
    </div>
{%- endmacro %}

{% macro render_pagination(current_page, page_list, endpoint, username=None) -%}
    <div class="container mt-6">
        <ul class="pagination justify-content-center">
            {% for page in page_list %}
                {% if page %}
                    {% if page == current_page %}
                        <li class="page-item active"><a class="page-link" href="#">{{ page }}</a></li>
                {% else %}
                    {% if username %}
                        <li class="page-item"><a class="page-link" href="{{ url_for(endpoint, page=page, username=username) }}">{{ page }}</a></li>
                    {% else %}
```

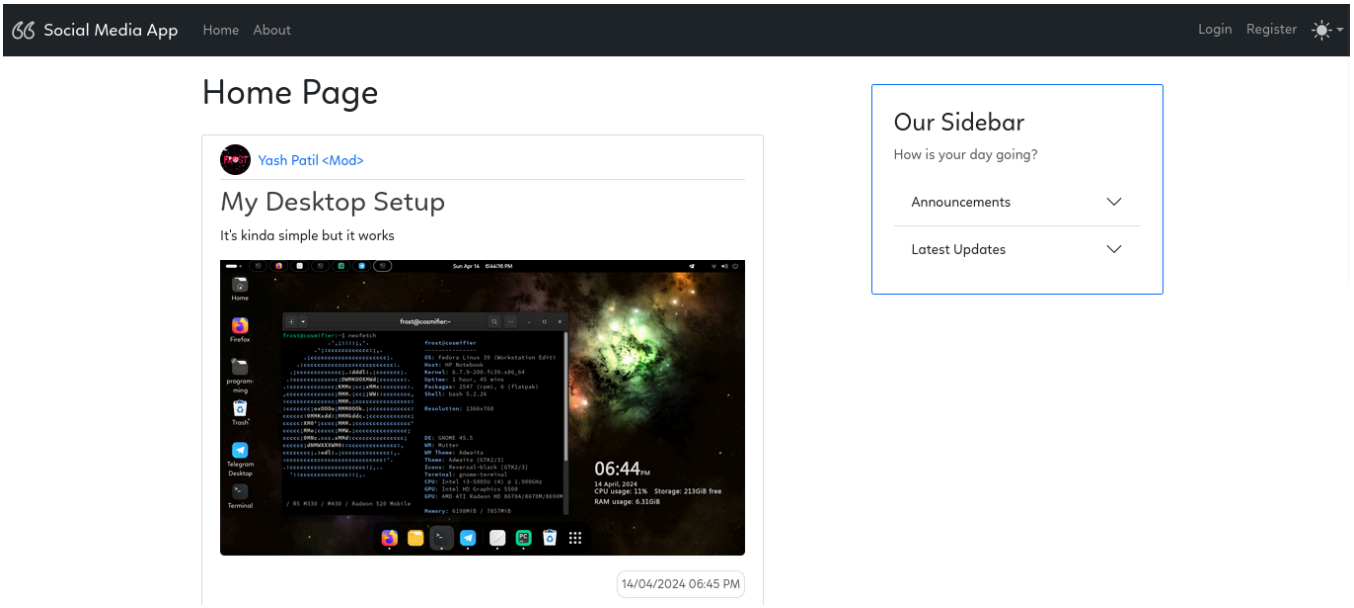
6. Templates : Consisting of html pages each exercising its own function such as linking home, login, register pages, creating posts etc.



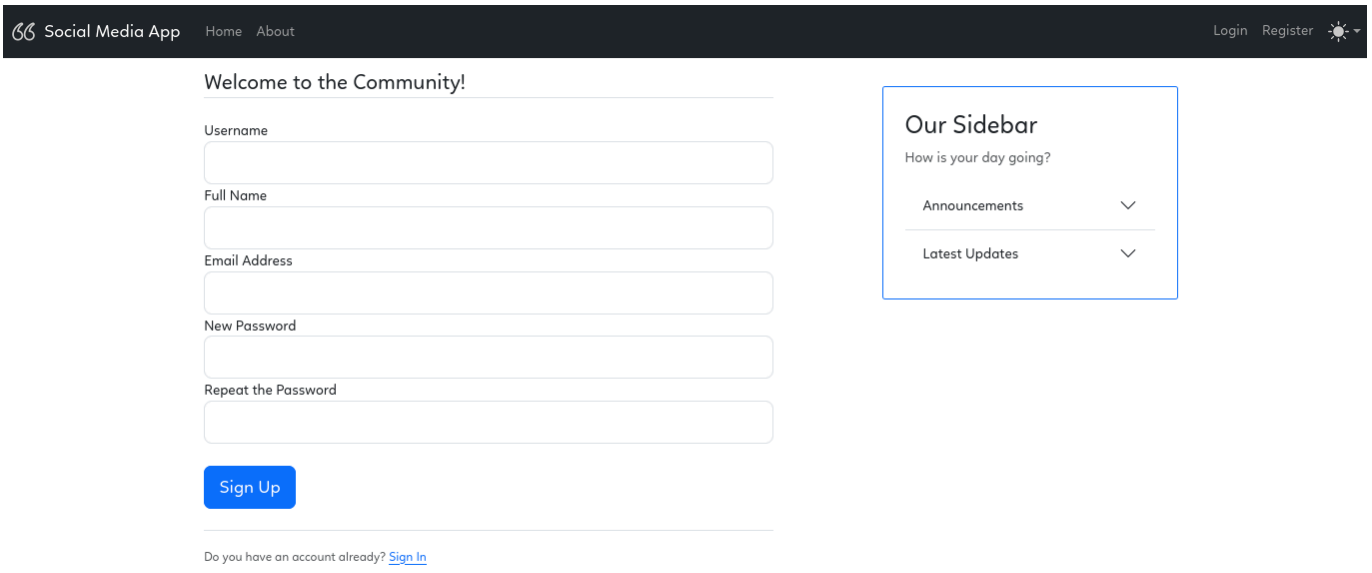
Output/Result:

Following are some screenshots of working of our Application.

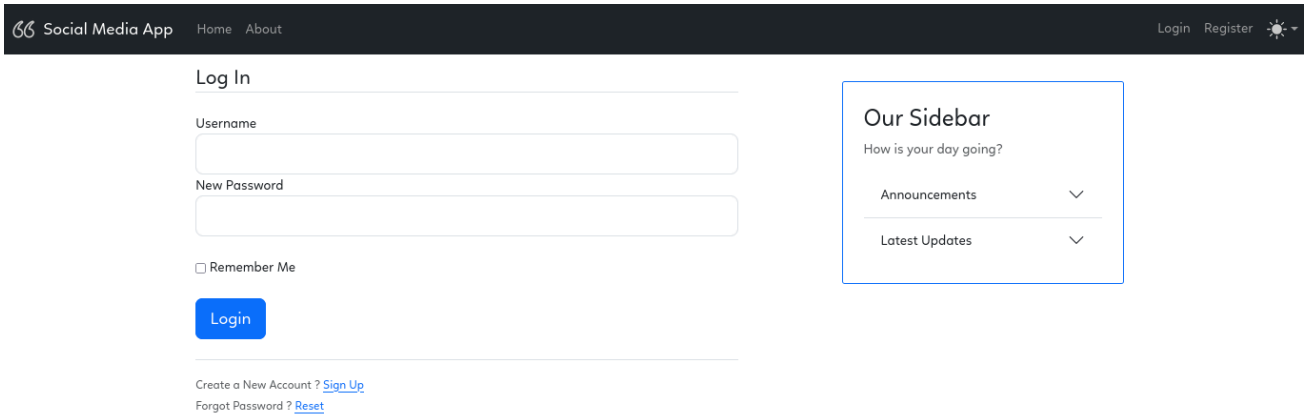
- Home Page:



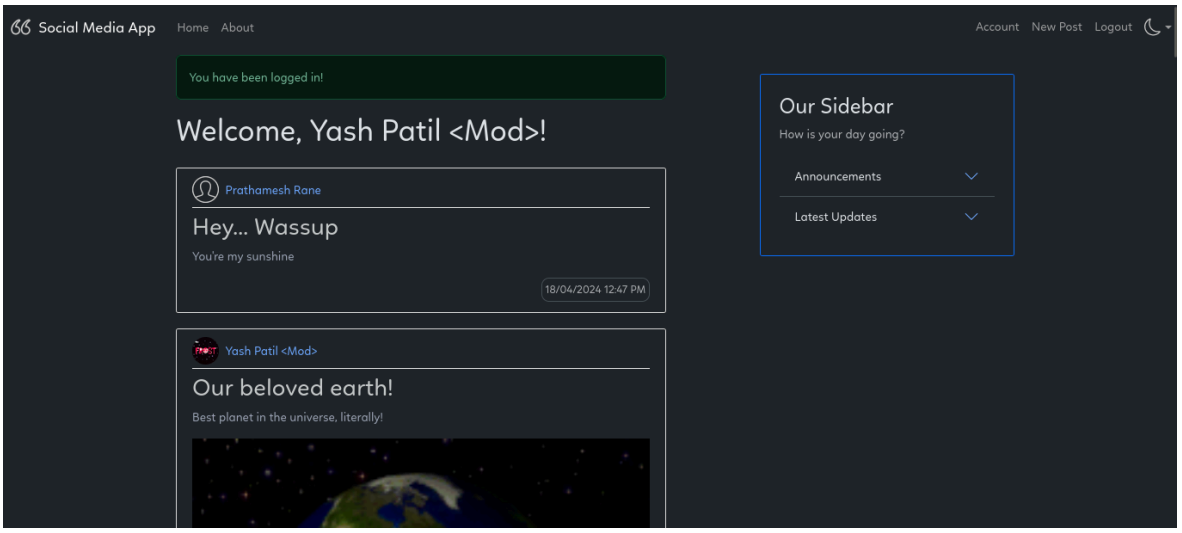
- Register Page:



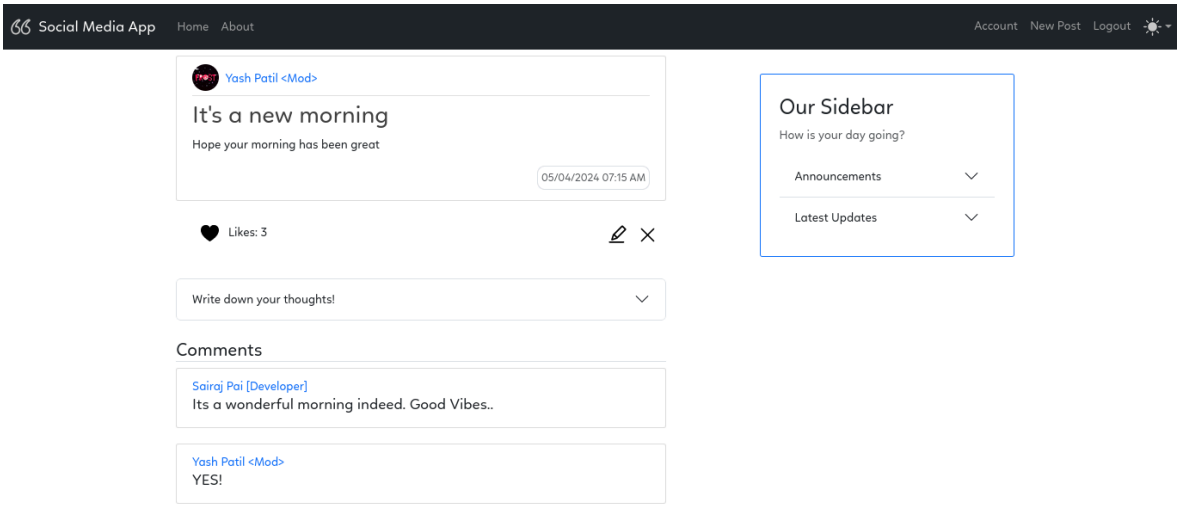
- Login Page:



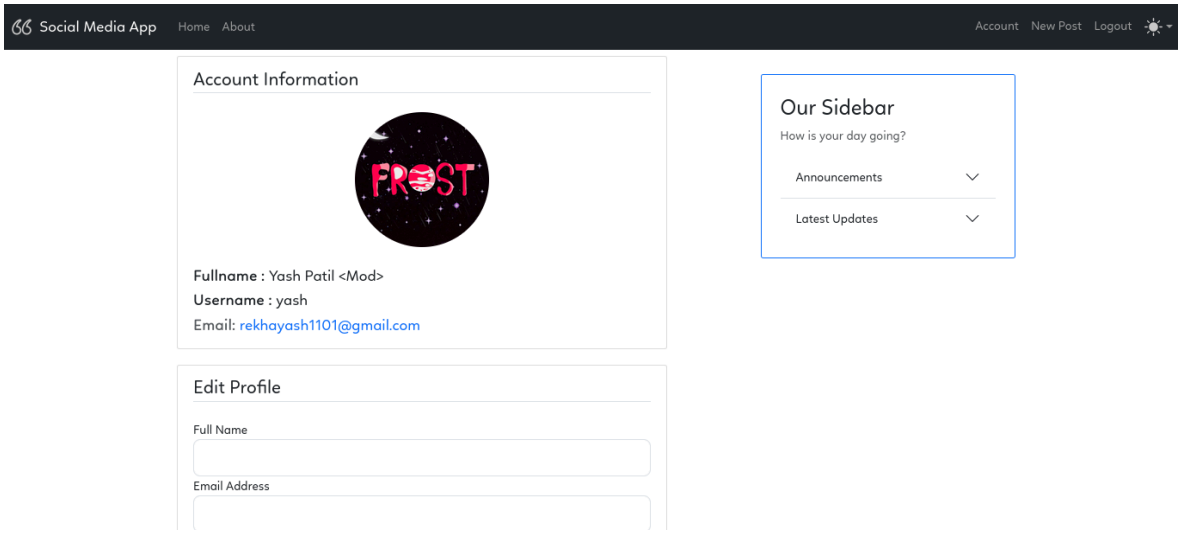
- Home Page after Logging in (Featuring Dark Mode):



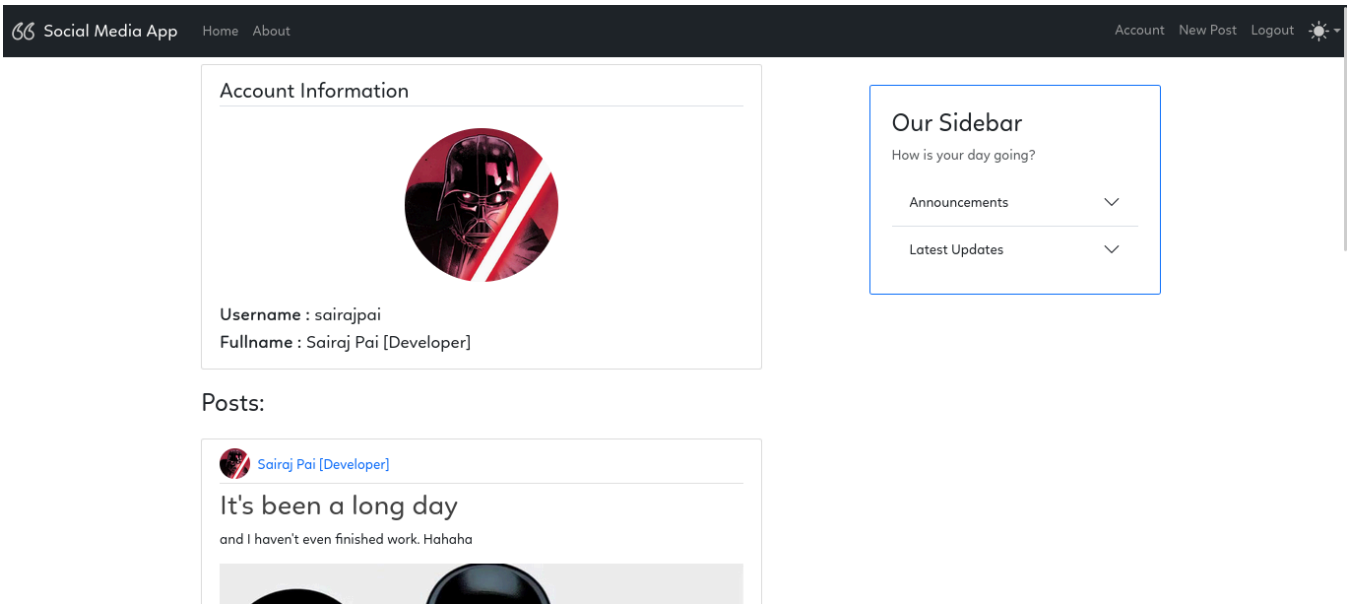
- Post Page, Like and Comment section, edit and delete Post:



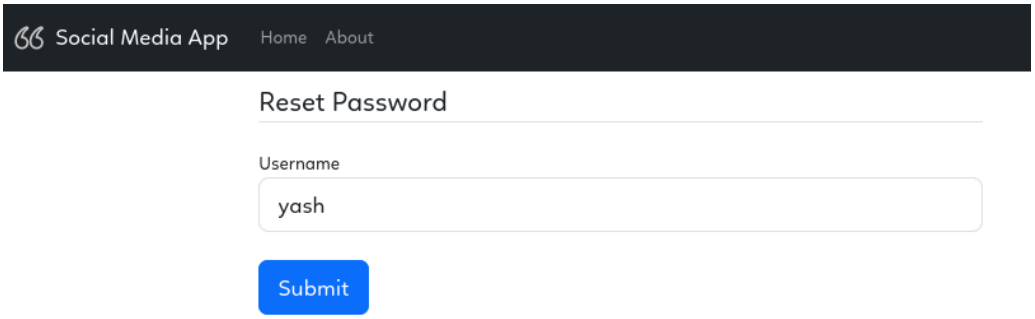
- View/Update Account Information Form

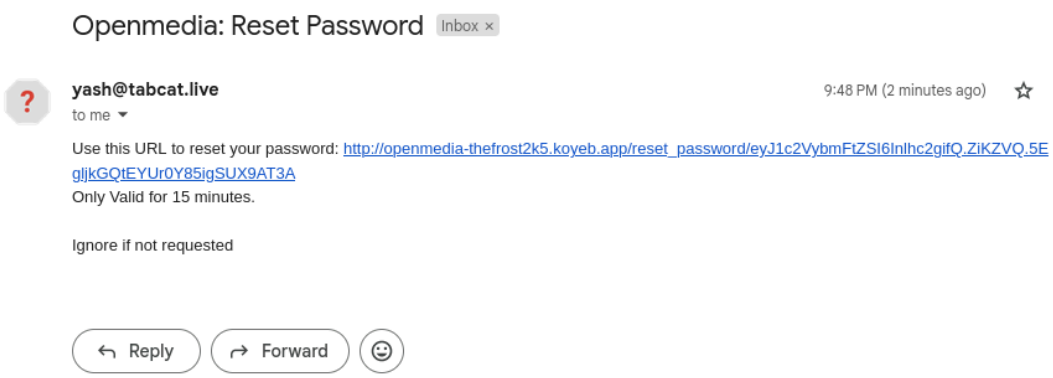


- Profile page of users

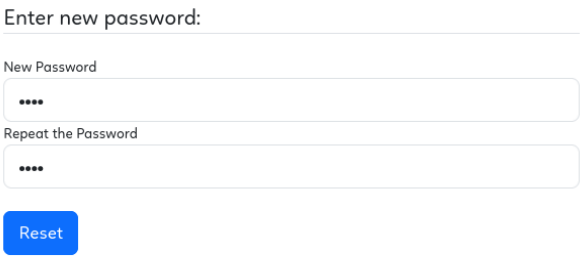


- Reset Password Functionality:



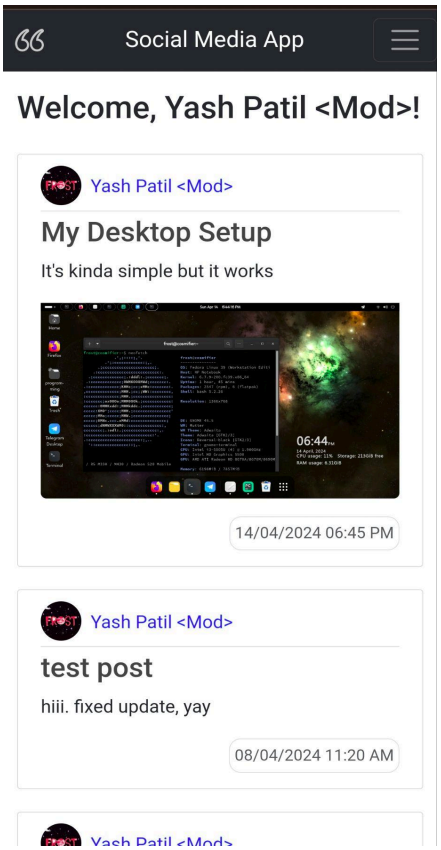


Reset Password Email



Reset Password Form

- Mobile Friendly view of WebApp:



3.6 CONCLUSION

In conclusion, OpenMedia represents a comprehensive solution designed to revolutionize the way we engage with digital content in a social media context. Through a harmonious integration of advanced technologies, user-centric design principles, and robust security measures, OpenMedia offers users a versatile platform for connecting, sharing, and discovering content with ease.

With its intuitive interface, rich feature set, and commitment to privacy and data security, OpenMedia sets a new standard for social media platforms, empowering users to cultivate meaningful connections, foster communities, and express themselves freely in a safe and inclusive environment.

As we look to the future, OpenMedia stands poised to continue evolving and adapting to the ever-changing needs and preferences of its users. With ongoing updates, enhancements, and community-driven contributions, OpenMedia is committed to remaining at the forefront of social media innovation, delivering a seamless and enriching experience for users worldwide.

FUTURE SCOPE

1. **Expansion to new platforms:** Develop mobile apps for iOS and Android to increase user reach and engagem**ent.**

2. **AI-powered content moderation**: Integrate machine learning algorithms to detect and remove harmful or offensive content more efficiently.

3. **Influencer marketing platform**: Create a platform for influencers to connect with brands and users, promoting sponsored content and affiliate marketing.

4. **Enhanced Privacy Features:** Introduce advanced privacy features such as end-to-end encryption for private messages, anonymous browsing options, and granular control over data sharing and visibility settings, prioritizing user privacy and security.

5. **Group and Personal Messaging:** Enable users to engage in personal and group conversations with features like text, emojis, and multimedia sharing.

6. **Following and Follower Lists:** Provide users with comprehensive lists to track connections and activities, including sorting and filtering options.

7. **Integration of Multimedia:** Enhance support for various media types and integration with external platforms for seamless sharing.

8. **Integration of Games:** Introduce a gaming platform with diverse genres and features for discovery, leaderboards, and social sharing.

9. **Integration of Code Snippets:** Allow users to share and discuss code with syntax highlighting, collaboration tools, and debugging features.

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