A Final Report on

Short News Project

submitted in accomplishment of Mini project of SE LAB

TY COMP DIV 2

in

Computer Engineering

by

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1. Introduction

1.1 Problem Statement

In the era of information overload, accessing and consuming news content has become increasingly challenging for users. The purpose of the Short News project is to address this challenge by providing a centralized platform that simplifies news discovery and enhances the user experience through personalized recommendations.

1.2 Scope

The scope of the project extends beyond traditional news aggregation platforms to encompass advanced features such as personalized recommendations. By leveraging cutting-edge technologies, the project aims to deliver a comprehensive solution that meets the diverse needs of modern-day news consumers.

1.3 Abbreviations

- API: Application Programming Interface
- UI: User Interface
- DB: Database
- JWT: Json Web Token

1.4 Overview

This report provides an in-depth analysis of the Short News project, detailing its background, objectives, methodology, implementation highlights, results, challenges faced, and future directions.

2. Project Background

2.1 Requirement Analysis

The Short News project was conceptualized based on the growing need for a centralized platform that simplifies news consumption and enhances user engagement. Through extensive requirement analysis, it was identified that users face significant challenges in accessing relevant news content amidst the vast array of available sources. This necessitated the development of a solution that aggregates news articles, provides personalized recommendations, and facilitates seamless news consumption.

2.2 Contemporary Challenges

In today's digital landscape, users are inundated with an overwhelming amount of news content from various sources, making it difficult to filter through and find relevant information. Furthermore, the rise of misinformation and echo chambers has exacerbated the problem, leading to a lack of trust in traditional news sources. The Short News project aims to address these challenges by providing users with a reliable and personalized news consumption platform.

2.3 Encouragement to Work on the Project

The Short News project presents an exciting opportunity for learning and skill development. By working on this project, team members have the chance to explore emerging technologies such as machine learning, natural language processing, and cloud computing. Additionally, the project encourages collaboration and teamwork, providing a platform for students to apply theoretical knowledge to real-world problems.

2.4 Technologies Used

The News Archiver project utilizes a range of technologies and tools, including but not limited to:

- Frontend: React.js.
- Backend: Node.js, Express.js
- Database: MongoDB

Role of Technologies:

- **React.js** : Used for building the user interface, providing a responsive and visually appealing platform.
- **Node.js and Express.js**: Implemented for backend development, facilitating robust server-side operations and API integration.
- **MongoDB**: Utilized as the database system for efficient storage and retrieval of news articles and user data.

These technologies were chosen for their versatility, scalability, and compatibility with the project requirements, enabling seamless integration and efficient functionality across the platform.

3. Objectives and Scope

3.1 Extended Objectives

In addition to providing a centralized platform for news aggregation, the objectives of the News Archiver project include:

- Enhancing user engagement through personalized recommendations.
- Providing users with access to diverse news sources.
- Fostering technological innovation by exploring emerging technologies and methodologies in the field of recommendation systems.

3.2 Comprehensive Scope

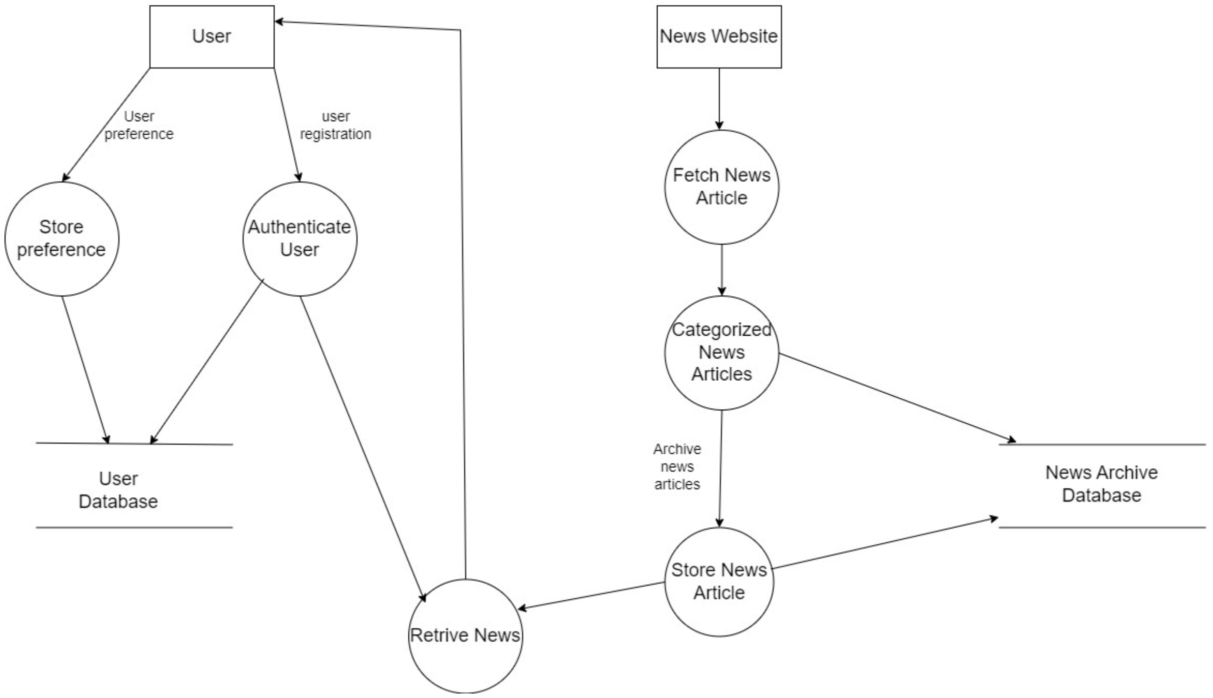
The scope of the project encompasses the development of a comprehensive news consumption platform, including features such as:

- User registration and authentication
- News aggregation and categorization
- Personalized news system

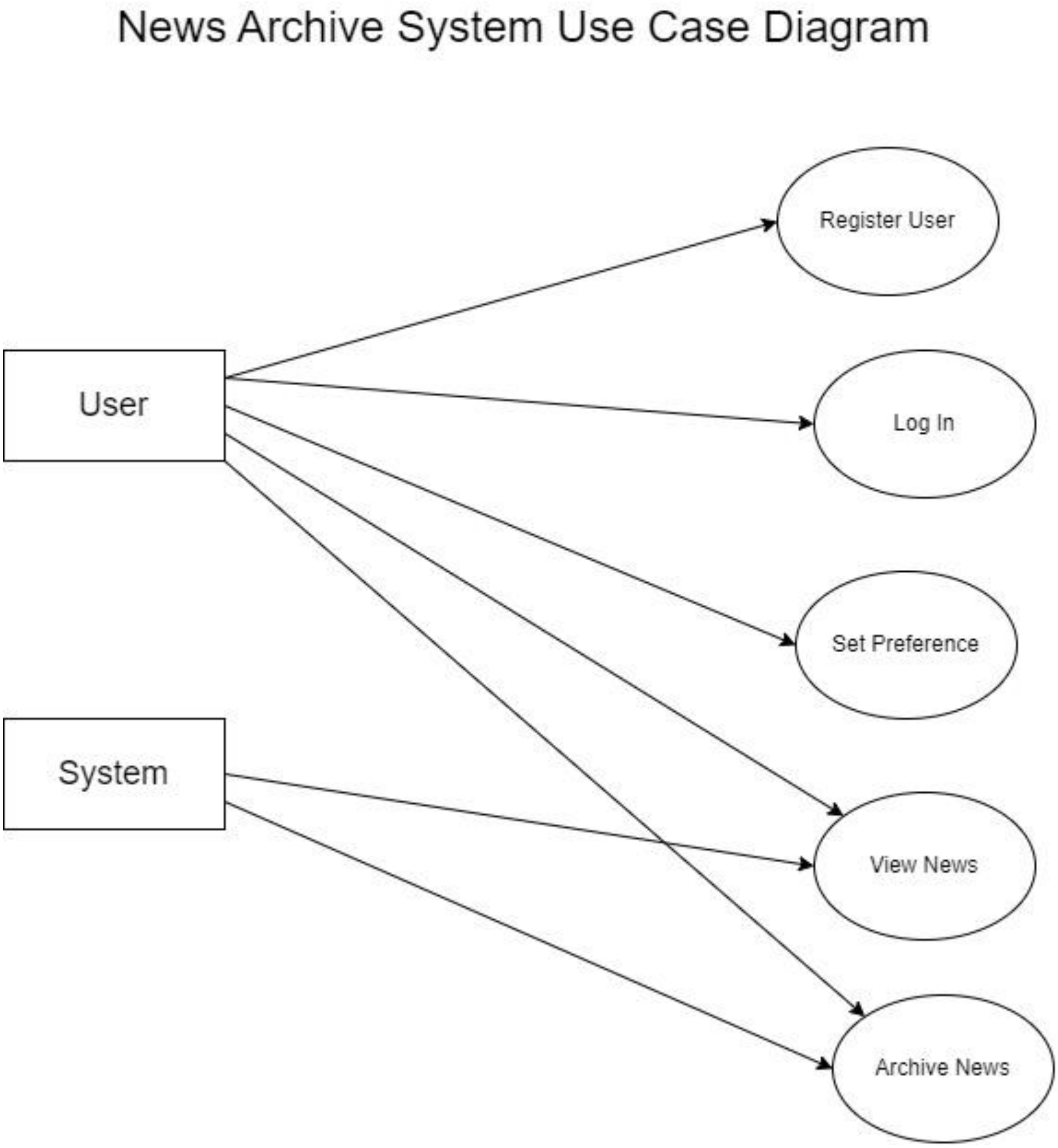
4. Diagrams

4.1 Data Flow Diagram

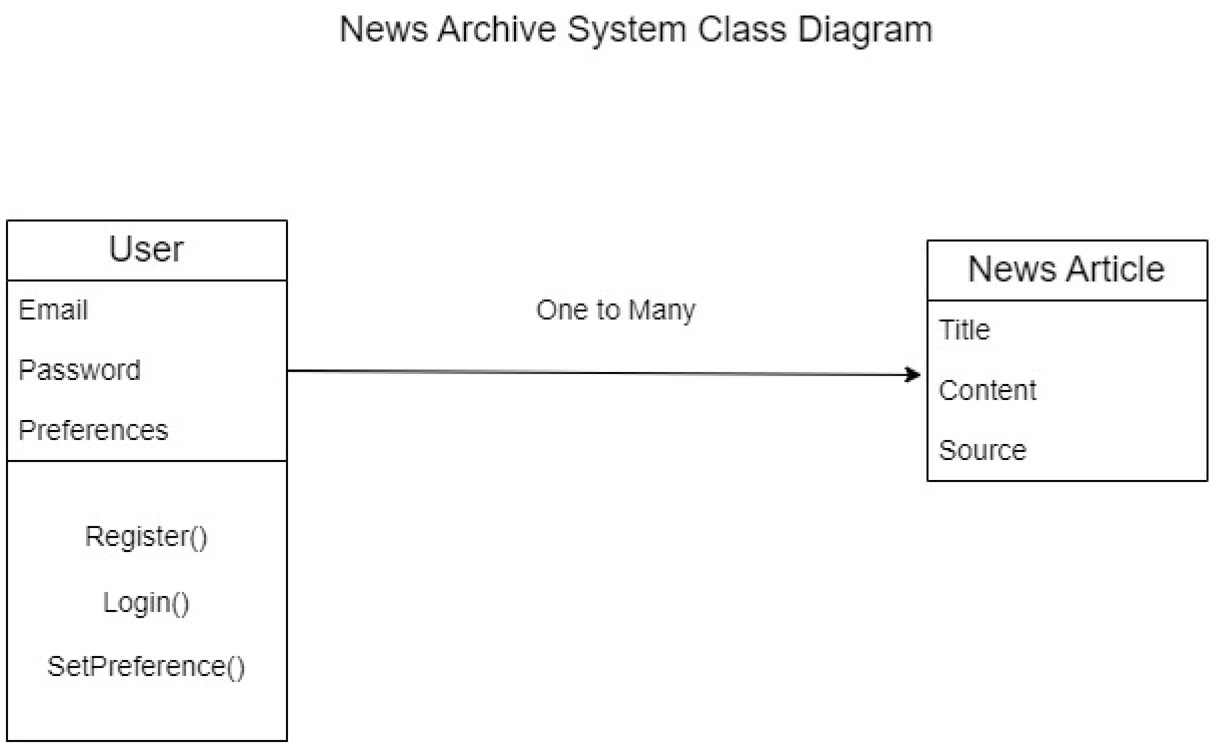
News Archive System Data Flow Diagram



4.2 UML Case Diagram



4.3 UML Class Diagram



5. Implementation Highlights (Pseudocode or Code Snippets)

5.1 User Registration and Authentication

During the user registration process, passwords are securely hashed using hashing algorithms before being stored in the MongoDB database. This ensures that user passwords are protected even in the event of a data breach, enhancing the security of the platform and safeguarding user accounts against unauthorized access.

```
1. Import React, useState, useNavigate, Link, requestNotificationPermission.
2. Define Login component with props { updateLoginStatus }.
3. Initialize state variables email and password using useState.
4. Define loginUser function:
   - Prevent default form submission.
   - Create requestOptions object for POST request.
   - Fetch "/signin" route, parse response JSON.
   - If status is 400 or data is empty/error, show "Invalid credentials" alert.
   - Else:
     - Show "Login Successful" alert.
     - Call updateLoginStatus with true and userID.
     - Navigate to home page.
   - Catch errors, show "An error occurred while logging in" alert.
5. Return JSX for login form with email, password fields and submit button.
   - Attach event handlers for input changes and form submission.
   - Include link to signup page.
6. Export Login component.
```

5.2 News Aggregation and Browsing

```
1. Define News component as a class component.
2. Set default props for category.
3. Define propTypes for category, isLoggedIn, and userId.
4. Initialize state variables articles, page, and totalResults.
5. Bind updateNews method in the constructor.
6. Implement componentDidMount lifecycle method:
   a. Call updateNews method.
   b. Set interval to call updateNews every 15 minutes.
7. Implement componentWillUnmount lifecycle method to clear the interval.
```

8. Implement updateNews method:
a. Make a POST request to "/api/articles" with isLoggedIn, userId, and category.
b. Parse the response as JSON.
c. If user is logged in, set articles state to the received data.
Otherwise, set articles state to allArticles.
d. Catch and log any errors.
9. Render the JSX for the News component:
a. Use a container div with a row to display news articles.
b. Map over the articles state to render NewsUpdate components.
10. Define NewsUpdate component as a class component.
11. Implement handleRead method to extract keywords and save preferences if user is logged in.
12. Render the JSX for the NewsUpdate component:
a. Use card elements to display news details like source, image, title, author, and read button.
b. Handle the read button click to call handleRead method.
c. Display default image if no image is available.
13. Export both News and NewsUpdate components.

5.3 Personalized News System

1. Define saveKeywordsToPreferences function:
a. Accepts keywords and userId as parameters.
b. Updates user document with userId by pushing keywords to preferences array.
c. Catch and log any errors.

2. Define rankArticles function:
a. Accepts articles and userPreferences arrays as parameters.
b. Create a uniqueArticlesMap to store unique articles with their scores.
c. Iterate over articles array:
i. Compute similarity score for each article based on user preferences using computeSimilarity function.
ii. If article is not in uniqueArticlesMap or its score is higher, update it in uniqueArticlesMap.
d. Convert uniqueArticlesMap values to an array.
e. Sort uniqueArticles array by score in descending order.
f. Return uniqueArticles array.

3. Define computeSimilarity function:
a. Accepts article and userPreferences arrays as parameters.

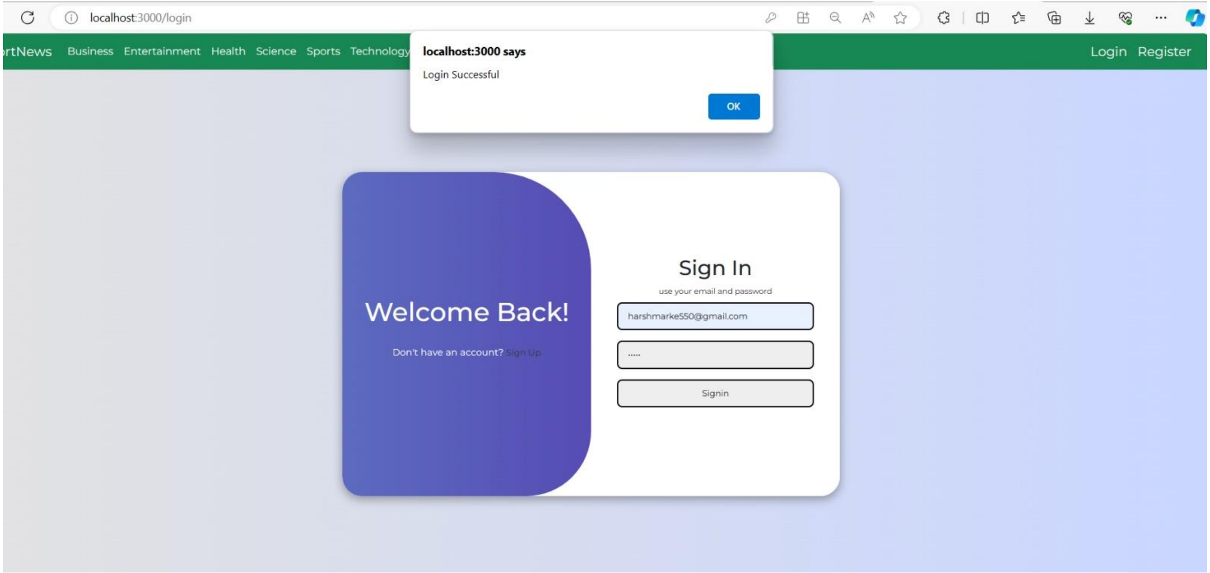
b. Initialize matchingWords counter to 0.
c. Convert article content to lowercase for case insensitivity.
d. Iterate over userPreferences array:
i. If article content includes current preference (case insensitive), increment matchingWords.
e. Return the ratio of matchingWords to total words in article content.

6. Testing

6.1 Black Box Testing

6.1.1 Test Case 1: Login Functionality

Case A: Valid Credential.
Testing Steps : Go to Login Page.
Enter valid credentials.
Click on login button.
Expected Behaviour of system :



localhost:3000 says

Login Successful

Welcome Back!

Don't have an account? Sign Up

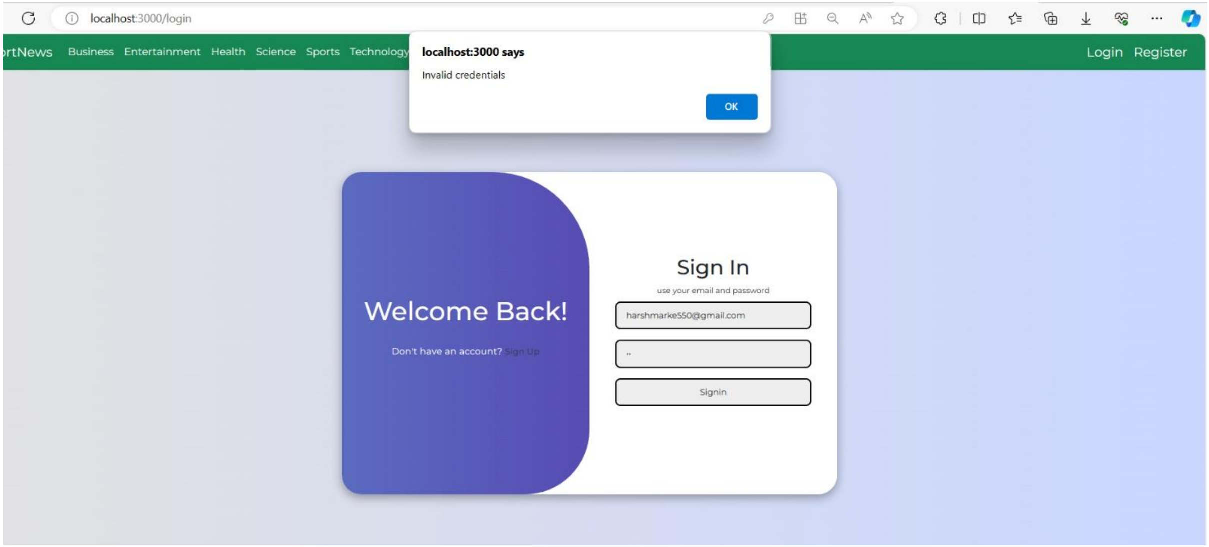
Sign In

use your email and password

harshmarke550@gmail.com

.....

Case B: Invalid Credential Or Empty Fields.
Testing Steps : Go to Login Page.
Enter invalid credentials.
Click on login button.
Expected Behaviour of system :



localhost:3000 says

Invalid credentials

Welcome Back!

Don't have an account? Sign Up

Sign In

use your email and password

harshmarke550@gmail.com

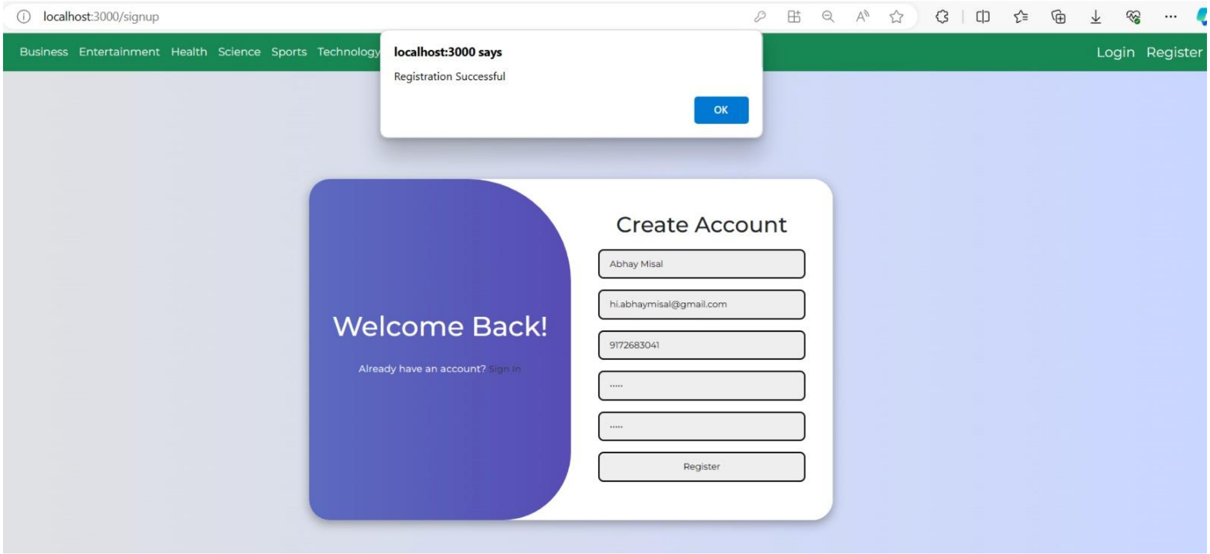
..

6.1.2 Test Case 2: Register Functionality.

Case A: Valid Credential.

Testing Steps : Go to Register Page.
Enter valid information.
Click on registration button.

Expected Behaviour of system :



localhost:3000 says

Registration Successful

Welcome Back!

Already have an account? Sign In

Create Account

Abhay Misal

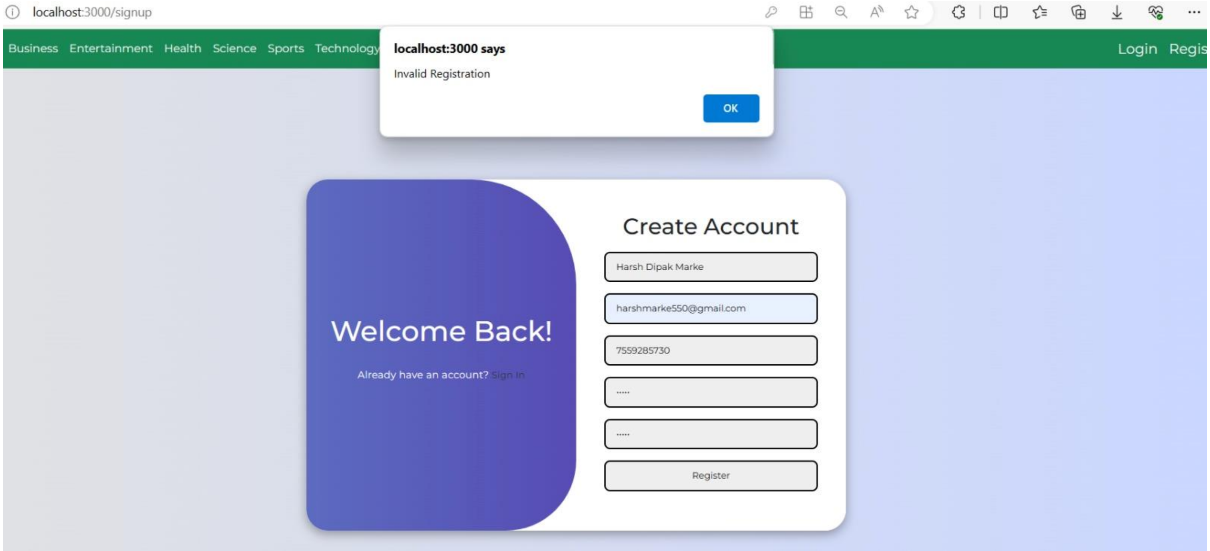
hi.abhaymisal@gmail.com

9172683041

.....

.....

Case B: Existing user Or Empty Fields.
Testing Steps : Go to Register Page.
Enter invalid information.
Click on Register button.
Expected Behaviour of system :



localhost:3000/signup

localhost:3000 says

Invalid Registration

OK

Welcome Back!

Already have an account? Sign In

Create Account

Harsh Dipak Marke

harshmarke550@gmail.com

7559285730

.....

.....

Register

6.2 White Box Testing

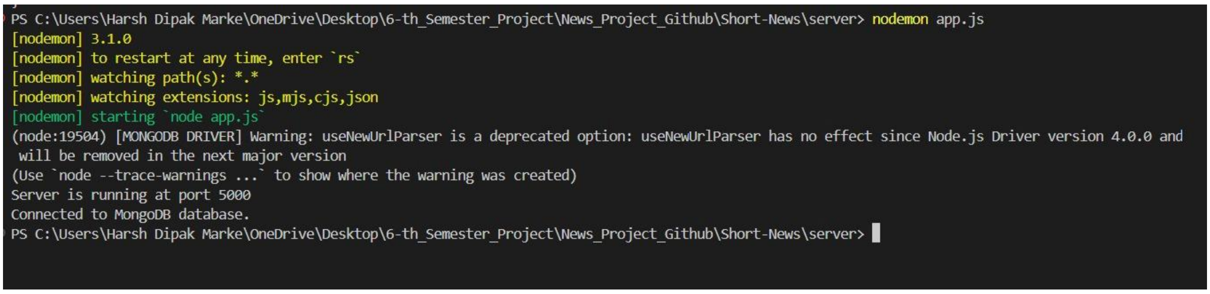
6.2.1 Test Case 1: Database connectivity.
Code of connection to database :

```
const mongoose = require("mongoose");
const mongoString =
mongodb+srv://${process.env.DB_USERNAME}:${process.env.DB_PASSWORD}@harsh.
izodb27.mongodb.net/?retryWrites=true&w=majority&appName=Harsh

mongoose.connect(mongoString, { useNewUrlParser: true })

mongoose.connection.on("error", function (error) {
  console.log(error);
})

mongoose.connection.on("open", function () {
  console.log("Connected to MongoDB database.");
})
```



```
PS C:\Users\Harsh Dipak Marke\OneDrive\Desktop\6-th_Semester_Project\News_Project_Github\Short-News\server> nodemon app.js
[nodemon] 3.1.0
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): *.*
[nodemon] watching extensions: js,mjs,cjs,json
[nodemon] starting `node app.js`
(node:19504) [MONGODB DRIVER] Warning: useNewUrlParser is a deprecated option: useNewUrlParser has no effect since Node.js Driver version 4.0.0 and
 will be removed in the next major version
(Use `node --trace-warnings ...` to show where the warning was created)
Server is running at port 5000
Connected to MongoDB database.
PS C:\Users\Harsh Dipak Marke\OneDrive\Desktop\6-th_Semester_Project\News_Project_Github\Short-News\server> 
```

7. Results and Achievements

7.1 Personalized News Display

Successfully implemented the feature to display news based on user preferences and interests, enhancing user experience and increasing user interaction time.

7.2 Seamless fetching of News

The platform seamlessly fetches news from various sources via API and efficiently stores it in the database.

7.3 Technological Advancements

The project has facilitated the acquisition of valuable skills and expertise in emerging technologies such as MERN stack, and cloud database. Through hands-on experience with these technologies, team members have gained a deeper understanding of their applications in real-world scenarios and their potential to drive innovation in the field of news consumption platforms.

8. Challenges Faced

8.1 Integration Complexities

Integrating external APIs and data sources posed significant challenges during the development process, requiring careful planning and coordination to ensure compatibility and reliability.

8.2 Performance Optimization

Optimizing the performance of the platform to handle increasing user loads and data volumes required meticulous attention to detail and the implementation of scalable infrastructure solutions.

8.3 Security Concerns

Addressing security concerns related to user data and privacy was a top priority throughout the development process, necessitating robust authentication mechanisms and encryption protocols to safeguard sensitive information.

9. Conclusion and Future Directions

In conclusion, the News Archiver project has successfully addressed the contemporary challenges faced by news consumers in accessing and engaging with relevant content. By providing a centralized platform with personalized recommendations, streamlined news discovery, and enhanced user engagement features, the project has redefined the way users interact with news articles. The implementation of advanced technologies such as machine learning and cloud computing has played a crucial role in achieving these objectives.

Looking ahead, there are several avenues for future development and enhancement of the News Archiver platform. Firstly, continued refinement of recommendation algorithms and data analytics techniques can further personalize the user experience and provide deeper insights into user preferences. Additionally, integration with emerging technologies such as natural language processing and sentiment analysis can enable more sophisticated content curation and sentiment-based recommendations.

Furthermore, expanding the platform's reach through mobile applications and social media integration can enhance user accessibility and engagement. Strengthening security measures and data privacy protocols will remain a priority to ensure the trust and confidence of users. Moreover, collaboration with news organizations and content creators can enrich the platform's content offerings and foster a vibrant news ecosystem.

In conclusion, the News Archiver project has laid a solid foundation for innovation and advancement in the field of news consumption platforms. With continuous iteration and adaptation to evolving user needs and technological advancements, the platform is poised to become a leading destination for curated news content, empowering users to stay informed and engaged in an ever-changing media landscape.

10. Acknowledgements

We express our sincere gratitude to our project guide, Jibi Abraham, for her unwavering support, guidance, and mentorship throughout the duration of the project. Her expertise and insights have been invaluable in shaping the direction and success of the project.

We also extend our appreciation to our fellow classmates and colleagues for their collaboration and support during the development process. Their contributions and feedback have been instrumental in refining the platform and enhancing its functionality.

Additionally, we would like to thank the College of Engineering Pune for providing us with the opportunity to undertake this project and for fostering an environment of learning and innovation.

11. References

[Insert References Here]