Industrial Internship Training Report

< EDUNET FOUNDATION 6- WEEKS INTERNSHIP ON EMERGING TECHNOLOGIES WITH IBM SKILLSBUILD >

Submitted
by
Sajan Kumar
(2101020509)
of
7th Semester/CSE

Under Supervision of:
Mr. Channabasava Yadav
All India Council for Technical Education (AICTE) and Edunet Foundation

(Duration: 24th June, 2024-31th July, 2024)

Department of Computer Science & Engineering
C. V. RAMAN GLOBAL UNIVERSITY,
BHUBANESWAR, ODISHA

December
2024

Contents

Declaration

I hereby declare that the internship report entitled "**Front End Development**" is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to substantial extent has been accepted for the award of any degree of the university or another institute of higher learning.

Name of the Student: Sajan Kumar
Regn No: 2101020509
Date: 15-11-2024

Department of Computer Science & Engineering

C. V. RAMAN GLOBAL UNIVERSITY

Certificate of Approval

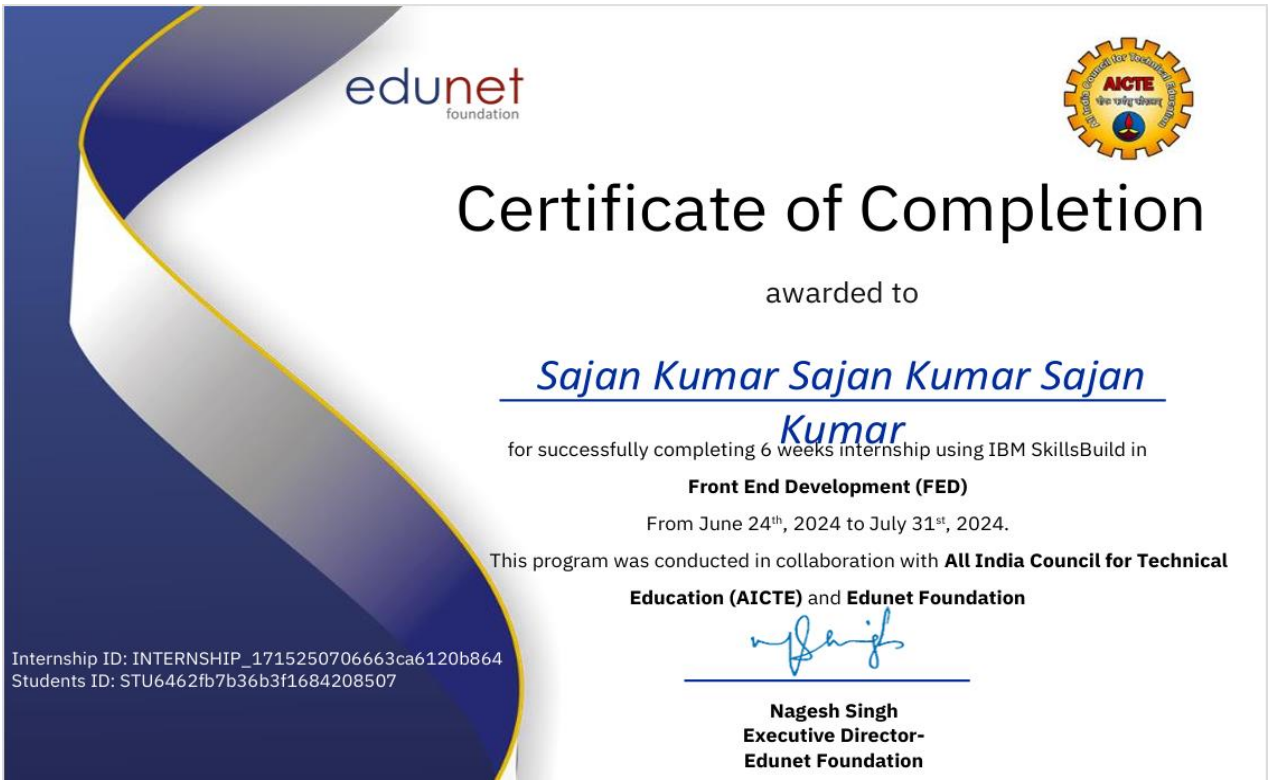
This is to certify that we have examined the training report entitled "**Front End Development**" submitted by, **Sajan Kumar(Reg.No:-2101020509)**, CGU, Bhubaneswar. We hereby accord our approval of the training work carried out and presented in a manner required for its acceptance as per the academic regulation, for the partial fulfillment for the **7th Semester** in **Computer Science & Engineering**. This training has fulfilled all the requirements as per the regulations of the university.

Prof. Monalisa Mishra
(Internship Coordinator)

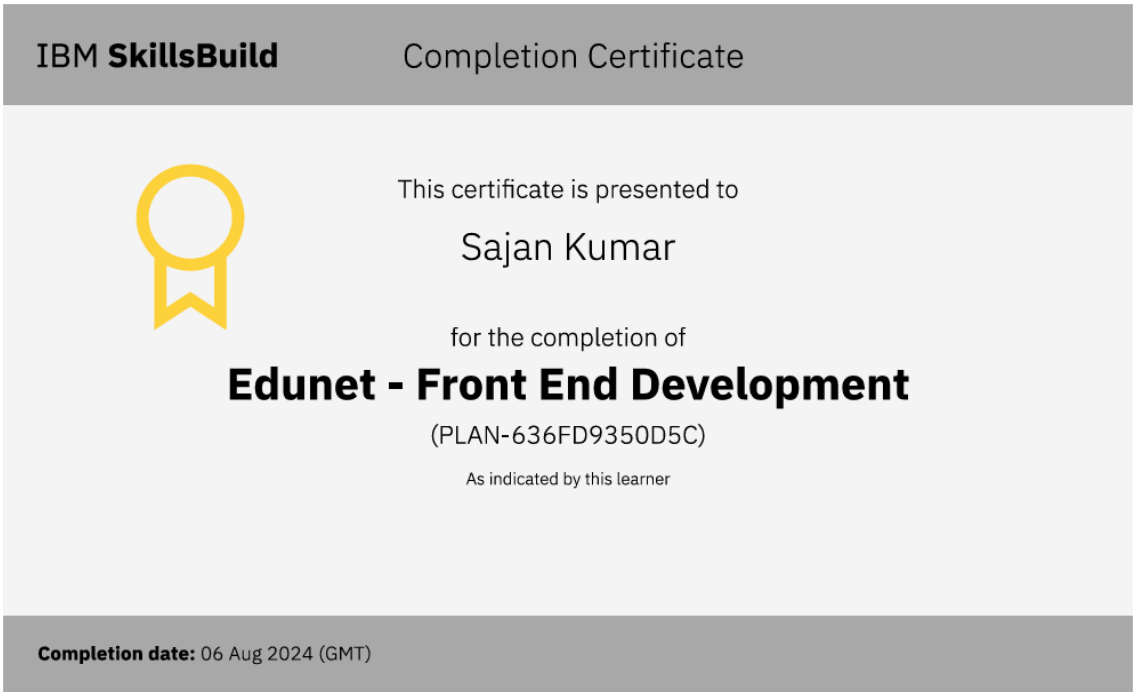
Dr. Rojalina Priyadarshini
(H.O.D, CSE)

Internship Completion Certificate

This program was conducted in collaboration with All India Council for Technical Education (AICTE) and Edunet Foundation.



 # Front End Development Course Certificates:



IBM Skillbuild Internship Courses Certificates:

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Sajan Kumar

for the completion of

Web Development Basics

(MDL-261)

According to the Moodle system of record

Completion date: 05 Aug 2024 (GMT) **Learning hours:** 1 hr 40 mins

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Sajan Kumar

for the completion of

Developing Sites for the Web

(MDL-262)

According to the Moodle system of record

Completion date: 05 Aug 2024 (GMT) **Learning hours:** 1 hr 40 mins

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Sajan Kumar

for the completion of

Your Future in Web Development: The Job Landscape

(MDL-267)

According to the Moodle system of record

Completion date: 06 Aug 2024 (GMT) **Learning hours:** 1 hr


IBM SkillsBuild
Completion Certificate
This certificate is presented to
Sajan Kumar
for the completion of
CSS Exercises
(ILB-EKVDPYPKGMKV155G)
According to the IBM Learning Patterns system of record
Completion date: 24 Jun 2024 (GMT)
Learning hours: 3 hrs


IBM SkillsBuild
Completion Certificate
This certificate is presented to
Sajan Kumar
for the completion of
Introduction to JavaScript and React 2/6
(URL-37B1AD3F2E31)
As indicated by this learner
Completion date: 06 Aug 2024 (GMT)
Learning hours: 1 hr

Acknowledgement

It gives me immense pleasure to express my sincere gratitude to our faculty coordinator **Prof. Monalisa Mishra** for her support and advices to get and complete internship in the above said organization.

I extend my sincere thanks to our HOD **Dr. R. Priyadarshini** for her immeasurable support throughout my internship.

I also like to acknowledge the contribution of other faculty members of the Department of CSE for their cooperation and kind assistance in successful completion of this internship.

December 2024 Sajan Kumar (2101020509)

Abstract

This industrial internship report outlines my 6-week training experience in Front-End Development, conducted under the IBM SkillsBuild program in collaboration with the Edunet Foundation and AICTE. The internship, held from June 24th to July 31st, 2024, at C.V. Raman Global University, Bhubaneswar, focused on developing technical skills in web technologies such as HTML, CSS, JavaScript, and Java Server Pages (JSP). The training aimed to enhance my proficiency in designing and implementing responsive and user-friendly web applications.

A significant component of this internship was the development of an "**Online Voting System"** project, which showcased the integration of JSP, MySQL, and front-end technologies to create a secure and efficient voting platform. The project involved creating a login system for user authentication, a voting interface for selecting candidates, and backend functionality for recording and managing votes in real-time. The database, managed using MySQL, ensured data integrity by preventing duplicate votes and enabling quick tallying of results. Key features included accessibility for remote voters, secure data handling, and user-friendly navigation. The system aimed to address modern challenges in electoral processes by providing a cost-effective, secure, and scalable solution.

This internship provided hands-on experience in full-stack web development, allowing me to apply theoretical knowledge in a practical environment. The project not only improved my technical capabilities but also enhanced my understanding of software development lifecycle, database management, and web security. The skills and knowledge gained during this period have equipped me for future challenges in the technology sector, reinforcing my goal to become a proficient software engineer.

WEEKLY OVERVIEW OF INTERNSHIP ACTIVITIES

Week	Agenda	Module Completed
1st Week	Orientation of Internship and Skills Build Platform.	• Registration on SkillsBuild using Gmail ID. • Exploring SkillsBuild and Learning Plan for the respective domain.
2nd Week	Technical Session, Project Topic	• Commence Project Related tasks. • Self-paced Learning.
3rd Week	Technical Session, Common Q&A form.	• Project related tasks. • Self-paced learning. • Share queries via Q&A form. • Attendance to Mentor-led query resolution sessions.
4th Week	Technical Session, Query Resolution.	
5th Week	Project Completion and Submission Q&A.	• Project Completion. • Self-Paced Learning Completion. • Creation of Project Presentation.
6th Week	Project Submission (PPT)	

Criteria for certification:

- Participation in weekly sessions with mentors is mandatory
- Completion of tasks/milestones on a weekly basis
- Completion of learning plan on SkillsBuild
- Submission of a project presentation required

Chapter 1

INTRODUCTION

The industrial internship program I undertook was a 6-week immersive training in Front-End Development, facilitated by IBM SkillsBuild in partnership with Edunet Foundation and AICTE. This internship, conducted from June 24th to July 31st, 2024, at C.V. Raman Global University, Bhubaneswar, aimed to enhance my proficiency in modern web development technologies. The program focused on providing hands-on experience with core web technologies such as HTML, CSS, JavaScript, and Java Server Pages (JSP), which are essential for developing dynamic and responsive web applications.

Overview

The primary project undertaken during this internship was the development of an "**Online Voting System"**. This project was designed to digitize traditional voting processes by creating a secure and efficient platform for online voting. The system was built using a combination of JSP for server-side scripting, MySQL for database management, and front-end technologies to ensure an intuitive user interface. This project aimed to address modern challenges in electoral systems, focusing on accessibility, security, and real-time results.

Background and Motivation

With the rapid adoption of digital platforms, there is a growing need for online solutions that enhance user accessibility and streamline processes. Traditional voting methods are often time-consuming, resource-intensive, and susceptible to errors. The motivation behind the **Online Voting System** project was to leverage web technologies to create a solution that offers convenience, reduces operational costs, and increases voter turnout by allowing remote participation. The system aimed to provide a secure voting experience with features such as user authentication, secure data handling, and immediate vote tallying.

Learning Objectives

The key objective of this internship was to bridge the gap between academic knowledge and real-world application. The training aimed to equip me with the skills necessary to develop full-stack web applications, focusing on both front-end and back-end technologies. By working on the Online Voting System, I aimed to achieve the following learning outcomes:

- **Technical Proficiency**: Gain hands-on experience with HTML, CSS, JavaScript, and JSP for web development, along with MySQL for database management.
- **Project Management**: Enhance my ability to manage project timelines, implement software development best practices, and work in a collaborative environment.
- **Problem-Solving**: Develop solutions to real-world challenges by implementing secure and efficient online systems, focusing on user authentication, data security, and user experience.

- **Adaptability**: Learn to work with various tools and technologies, adapting to the evolving demands of the software industry.

The internship has significantly aided my development as a software developer, offering practical experience in scalable web solutions and strengthening my skills in web development and database management, preparing me for future technology challenges.

METHODLOGY

The development of the **Online Voting System** during my 6-week internship followed a structured methodology, which encompassed various stages of the software development lifecycle (SDLC). This approach ensured the delivery of a robust, secure, and user-friendly web application.

(i) Requirement Analysis: The first step involved gathering requirements to understand the scope of the online voting system. This included identifying the necessary features like user authentication, voting interface, and real-time result compilation. The goal was to create a secure and efficient voting platform accessible to users remotely.

(ii) Implementation: The implementation phase involved developing the web application using a combination of technologies, each serving a specific purpose:

- **HTML (HyperText Markup Language)**: HTML was used to structure the web pages of the Online Voting System. It provided the foundational elements like forms, buttons, input fields, and links.

  ✓ **Skills Used**:

  - Creating responsive layouts using semantic tags (e.g., <form>, <input>, <button>).
  - Implementing navigation elements to enhance user experience.
  - Structuring content hierarchically for better accessibility.

- **CSS (Cascading Style Sheets)**: CSS was employed to style the HTML elements, making the application visually appealing and user-friendly.

  ✓ **Skills Used**:

  - Applying styles to enhance the appearance of forms, buttons, and navigation bars.
  - Using **CSS Flexbox** and **Grid** layouts to create a responsive design that adapts to different screen sizes.
  - Utilizing color schemes, fonts, and spacing to improve the user interface (UI).

- **JavaScript:** JavaScript added interactivity and dynamic behavior to the voting system. It was used to validate user input and enhance the overall user experience.

    - ✓ **Skills Used**:

        - Implementing **client-side validation** for form inputs to ensure users provide correct data (e.g., checking if all fields are filled before submitting).
        - Creating interactive elements like alerts and confirmations (e.g., confirming a user's vote).
        - Using **DOM manipulation** to dynamically update content without reloading the page.

- **Java Server Pages (JSP):** JSP was used for server-side scripting to handle business logic, manage user sessions, and interact with the database.

    - ✓ **Skills Used**:

        - Writing JSP scripts to process form data submitted by users (e.g., handling login requests).
        - Managing user sessions for secure authentication and maintaining the voting state.
        - Embedding Java code within HTML to dynamically generate content based on user interactions.

- **JDBC (Java Database Connectivity) & MySQL:** JDBC was used to connect the web application to a MySQL database, allowing for secure data storage and retrieval.

    - ✓ **Skills Used**:

        - Writing SQL queries to create and manage tables for storing user credentials, voting records, and results.
        - Implementing **Prepared Statements** in JSP to prevent SQL injection attacks, enhancing security.
        - Performing **CRUD (Create, Read, Update, Delete)** operations to manage voter data.

(iii) Testing: After implementation, extensive testing was conducted to ensure the system's functionality, security, and performance. The testing process included:

- **Unit Testing**: Verifying individual components like login, voting, and result modules.
- **Integration Testing**: Ensuring seamless interaction between the front-end and back-end components.
- **Security Testing**: Assessing the system's resilience to potential threats like SQL injection and session hijacking.

PROJECT DESCRIPTION

The project undertaken during my 6-week internship was the development of an **Online Voting System**. This web-based application was designed to digitize the traditional voting process, making it more accessible, efficient, and secure. The system was developed using a combination of front-end and back-end technologies, including HTML, CSS, JavaScript, Java Server Pages (JSP), and MySQL. The primary goal was to create a secure platform that allows users to cast their votes online, thereby overcoming the limitations of conventional paper-based voting systems.

Project Workflow

(i) Login and Authentication: Users start by logging into the system using their credentials. If the user is authenticated successfully, they are redirected to the voting page.

(ii) Voting Process: Users are presented with a voting form where they can select a candidate and submit their vote. The system checks if the user has already voted before allowing the submission.

(iii) Vote Recording and Validation: Once a vote is cast, it is securely recorded in the database, and the user's voting status is updated to prevent multiple votes.

(iv) Logout and Session Termination: After voting, users can log out to end their session, ensuring that their credentials cannot be misused.

SOURCE CODE

- **Login.html**

```
<!DOCTYPE html>
<html>
<head>
	<title>Login Page</title>
</head>
<body>
	<h2>Login</h2>
	<form action="authenticate.jsp" method="post">
		Username: <input type="text" name="username" required><br>
		<input type="submit" value="Login">
	</form>
</body>
</html>
```

- **Authenticate.jsp**

```
<%@ page import="java.sql.*" %>
<%@ page import="java.io.*" %>
<%
String username = request.getParameter("username");

try   { Class.forName("com.mysql.cj.jdbc.Driver"); Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/VotingSystem", "root","tiger");
        PreparedStatement ps = con.prepareStatement("SELECT * FROM Voters WHEREusername=?");
        ps.setString(1, username); ResultSet rs =
        ps.executeQuery();if (rs.next()) {
                session.setAttribute("username", username);
                response.sendRedirect("voting.jsp");
        } else {
                out.println("Invalid user!.");
        }
        con.close();
} catch(Exception e) {
        out.println(e);
}
%>
```

- **Voting.jsp**

```
<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<%@ page import="java.sql.*" %>
<%@ page import="java.io.*" %>
<%
String username = (String) session.getAttribute("username");
if (username == null) { response.sendRedirect("login.jsp");
}

   String alreadyVoted = "no";
   try   { Class.forName("com.mysql.cj.jdbc.Driver"); Connection con =
   DriverManager.getConnection("jdbc:mysql://localhost:3306/VotingSystem", "root","tiger");
           PreparedStatement ps = con.prepareStatement("SELECT voted FROM Voters WHEREusername=?");
           ps.setString(1, username); ResultSet rs =
           ps.executeQuery();if (rs.next()) {
                   alreadyVoted = rs.getString("voted");
           }
           con.close();
   } catch(Exception e) {
           out.println(e);
   }
   %>
   <!DOCTYPE html>
   <html>
   <head>
           <title>Voting Page</title>
   </head>
   <body>
           <h2>Welcome <%= username %></h2>
           <% if (alreadyVoted.equals("yes")) { %>
                   <p>You have already voted.</p>
                   <a href="logout.jsp">Logout</a>
           <% } else { %>
                   <form action="vote.jsp" method="post">
                           <input type="radio" name="vote" value="AAP">AAP<br>
                           <input type="radio" name="vote" value="BJP">BJP<br>
                           <input type="radio" name="vote" value="Congress">Congress<br>
                           <input type="radio" name="vote" value="None">None<br>
                           <input type="submit" value="Cast Vote">
                   </form>
           <% } %>
   </body>
   </html>
```

- **Vote.js**

```
<%@ page import="java.sql.*" %>
<%@ page import="java.io.*" %>
<%
String vote = request.getParameter("vote");
String username = (String) session.getAttribute("username");

try   { Class.forName("com.mysql.cj.jdbc.Driver"); Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/VotingSystem", "root","tiger");
      PreparedStatement psCheck = con.prepareStatement("SELECT voted FROM Voters WHEREusername=?");
      psCheck.setString(1, username); ResultSet rs =
      psCheck.executeQuery();if (rs.next()) {
            String alreadyVoted = rs.getString("voted");
            if (alreadyVoted.equals("yes")) {
                  response.sendRedirect("voting.jsp"); return;
            }
      }
```

- **Logout.jsp**

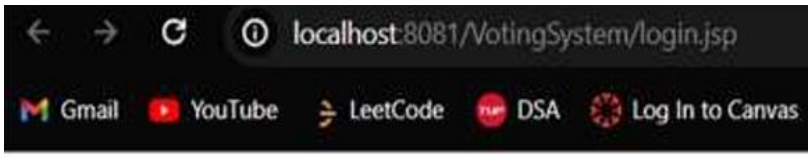
```
<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<%
session.invalidate(); response.sendRedirect("login.jsp");
%>
```

- **SQL Queries:**

```
CREATE DATABASE VotingSystem;
USE VotingSystem;

CREATE TABLE Voters ( id
      INT PRIMARY KEY,
      username VARCHAR(50) UNIQUE,
      voted VARCHAR(50)
);

INSERT INTO Voters VALUES (1, 'BISWAJEET SAMAL', 'no'); INSERT
INTO Voters VALUES (2, ' RAJESH KUMAR GOUDA', 'no');INSERT INTO
Voters VALUES (3, 'ARPIT SHRIVASTAVA', 'no'); INSERT INTO Voters
VALUES (4, 'TANIYA ANSHU', 'no');
INSERT INTO Voters VALUES (5, 'SAJAN KUMAR', 'no');

select * from Voters;
```

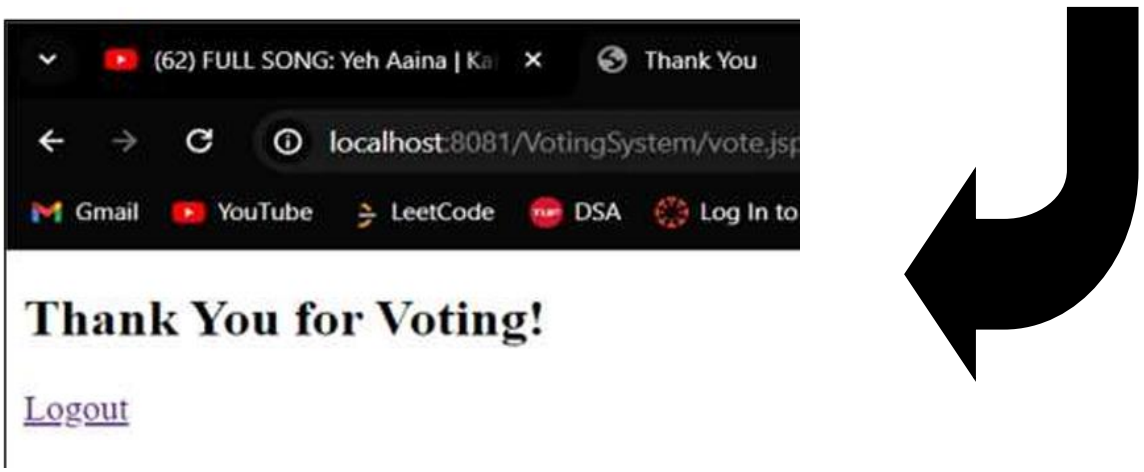
	id	username	voted
▶	1	BISWAJEET SAMAL	yes
	2	RAJESH KUMAR GOUDA	no
	3	ARPIT SHRIVASTAVA	no
	4	TANIYA ANSHU	no
	5	SAJAN KUMAR	no
*	NULL	NULL	NULL

RESULTS

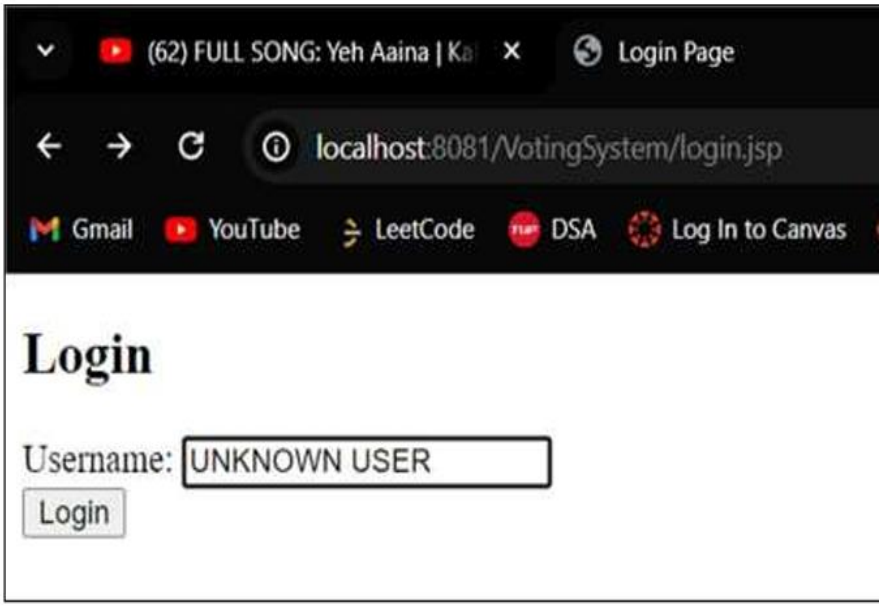

localhost:8081/VotingSystem/login.jsp
Gmail
YouTube
LeetCode
DSA
Log In to Canvas


Login
Username:
Login
Gmail
YouTube
LeetCode
DSA
Log In to Canvas
Login
Username: BISWAJEET SAMAL
Login
(62) FULL SONG: Yeh Aaina
Voting Page
localhost:8081/VotingSystem/voting.jsp
Gmail
YouTube
LeetCode
DSA
Log In to Canvas
Dashboard
Welcome BISWAJEET SAMAL
You have already voted.
Logout


Gmail
YouTube
LeetCode
Login
Username: TANIYA ANSHU
Login
(62) FULL SONG: Yeh Aaina | Ka
Voting Page
Gmail
YouTube
LeetCode
DSA
Welcome TANIYA ANSHU
AAP
BJP
Congress
None
Cast Vote


(62) FULL SONG: Yeh Aaina | Ka
Thank You
localhost:8081/VotingSystem/vote.jsp
Gmail
YouTube
LeetCode
DSA
Thank You for Voting!
Logout

	id	username	voted
▶	1	BISWAJEET SAMAL	yes
	2	RAJESH KUMAR GOUDA	no
	3	ARPIT SHRIVASTAVA	no
	4	TANIYA ANSHU	yes
	5	SAJAN KUMAR	no
*	NULL	NULL	NULL



APPLICATION

The Online Voting System developed during my internship offers numerous applications across different sectors, significantly transforming the traditional voting process by leveraging digital technologies. Here are some of the key applications of this system:

(i) National and Local Elections:

- The online voting system can be adopted for national, state, or local elections to enable secure, remote voting. This can increase voter turnout by allowing citizens to participate in elections from anywhere, reducing the need for physical polling stations.
- It addresses the challenges faced by voters who are unable to visit polling booths due to mobility issues, geographical constraints, or busy schedules, thus promoting inclusivity in the democratic process.

(ii) Corporate and Organizational Elections: Many organizations, including corporations, universities, and non-profit institutions, conduct internal elections for positions like board members, representatives, and committee heads. An online voting system simplifies this process, ensuring secure and efficient elections within the organization.

(iii) Student Body Elections:

- Educational institutions can use the online voting system to conduct student body elections, club leadership selections, and other academic polls. It provides a convenient and accessible platform for students to vote, fostering greater participation.
- The system is ideal for universities and colleges, where students may be distributed across multiple campuses or attending classes remotely.

(iv) Surveys and Opinion Polls:

- Beyond elections, the online voting platform can be adapted for conducting surveys and opinion polls. Businesses, researchers, and government agencies can use it to gather public opinions on policies, products, or services.
- The system's real-time data collection and analysis capabilities enable organizations to make informed decisions based on immediate feedback.

Challenges and Solutions

- **Challenge**: Ensuring data security and preventing unauthorized access.
  - **Solution**: Implemented secure authentication mechanisms, session management, and input validation to protect against threats.
- **Challenge**: Handling multiple concurrent users and real-time vote counting.
  - **Solution**: Optimized database queries and used efficient data management techniques to ensure the system's scalability and performance.

CONCLUSION

This internship has significantly contributed to my growth as a software developer, providing me with practical exposure to the development of scalable web solutions and reinforcing my skills in web development and database management. The knowledge and experience gained through this program have prepared me for future challenges in the technology sector, aligning with my career goals in software engineering. The 6-week industrial internship in Front-End Development, conducted under IBM SkillsBuild program, was a valuable experience that improved technical skills and web development understanding. It provided hands-on exposure to modern web technologies like HTML, CSS, JavaScript, and JSP, bridging the gap between classroom learning and industry practices.

The highlight of this internship was the development of the **Online Voting System**, a web-based application designed to digitize the voting process. This project not only challenged me to leverage my skills in both front-end and back-end development but also deepened my understanding of database management and web security. By implementing features like user authentication, secure vote casting, and real-time result compilation using JSP, MySQL, and JDBC, I learned the intricacies of building scalable and secure web applications.

The **Online Voting System** project served as a practical platform to apply the concepts learned during the training. This project not only improved my technical skills in front-end and back-end development but also honed my critical thinking, problem-solving, and troubleshooting abilities. I gained hands-on experience in building a secure, user-friendly web application that addresses real-world challenges, such as accessibility and data security.