An Internship Report on

FULL STACK DEVELOPMENT (MERN)

In the partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

(FOR THE ACADEMIC YEAR 2020-2024)

Submitted by

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CERTIFICATE

This is to certify that the Internship report entitled **"FULL STACK DEVELOPMENT (MERN)"** is a piece of project work done by **ATMAKURI SRUTHI (20HU1A0403), AKI LAVANYA (20HU1A0401), MUPPARAJU ANURADHA (20HU1A0408)** and **NANDAM CHAITANYA SRI (20HU1A0409)**. Under the guidance of Mrs. **THRIVENI. PALADUGU** M.Tech, Asst.professor. at **the DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING** for the degree of Bachelor of Technology of JNTU- KAKINADA, AP,INDIA.

The project viva-voice Exam is held on_____of_____,2023/2024.

Project Guide

Head of the Department

External Examiner

DECLARATION

We hereby declare that the project report entitled "**FULL STACK DEVELOPMENT (MERN)**" with reference to JNTU KAKINADA is carried out by us under the guidance of **Mrs. THRIVENI. PALADUGU, M. Tech, Asst.professor.** We also declare that this project report is a result of our own effort and were not submitted to any other completion of bachelor of technology in **ELECTRONICS AND COMMUNICATION ENGINEERING.**

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Finally, we wish to express our whole gratitude to our **PARENTS** and all our **FRIENDS** without whose encouragement would not have been able to complete this work.

WITH REGARDS

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ABSTRACT

This abstract presents the development of a Video Conferencing Application leveraging the MERN (MongoDB, Express.js, React.js, Node.js) stack. In today's digital era, the demand for real-time communication solutions has surged, especially with the global shift towards remote work and online collaboration. Video conferencing apps have become indispensable tools for businesses, educational institutions, and individuals alike.

The MERN stack offers a robust and efficient framework for developing modern web applications. MongoDB serves as the database, providing a flexible and scalable solution for storing user data, chat histories, and other relevant information. Express.js, a minimalist web application framework for Node.js, facilitates the creation of the application's backend, handling routing, middleware, and API requests. Node.js, known for its asynchronous and event-driven architecture, powers the server-side logic, enabling seamless communication between the client and server. On the frontend, React.js, a powerful JavaScript library for building user interfaces, offers a dynamic and responsive UI experience. Leveraging React's component-based architecture, developers can create reusable UI components, ensuring a modular and maintainable codebase. Additionally, React's virtual DOM enhances performance by efficiently updating the UI in response to user interactions and data changes.

The video conferencing app developed in this project encompasses key features such as real-time video and audio communication, text chat functionality, user authentication, and session management. WebRTC (Web Real-Time Communication) technology is employed for enabling peer-to-peer communication, facilitating high-quality video and audio streaming without requiring additional plugins.

1.INTRODUCTION

Full stack development refers to the practice of working on both the front end and back-end portions of a web application or software product. A "full stack developer" is someone who is proficient in both the client-side and server-side programming languages and frameworks necessary to build and maintain a complete application.

Here's a breakdown of the components typically involved in full stack development:

1. **Front-end Development**: This involves everything that users see and interact with on a website or application. Front-end developers use languages such as HTML, CSS, and JavaScript to create the layout, design, and functionality of the user interface. They also work with frameworks like React, Angular, or Vue.js to build interactive and responsive web applications.

2. **Back-end Development**: The back end of an application consists of the server, database, and application logic. Back-end developers are responsible for building and maintaining the server-side code that powers the application, manages data storage, and handles user authentication and authorization. Common languages and frameworks used in back-end development include Node.js, Python (with frameworks like Django or Flask), Ruby on Rails, and Java (with Spring framework).

3. **Databases and Data Storage**: Full stack developers often work with databases to store and retrieve data for their applications. This involves understanding database management systems (DBMS) like MySQL, PostgreSQL, MongoDB, or Firebase, and knowing how to write queries to interact with the data.

4. **APIs (Application Programming Interfaces)**: APIs allow different software systems to communicate and interact with each other. Full stack developers may need to create APIs to allow their front-end and back-end systems to exchange data seamlessly.

5. **DevOps and Deployment**: Full stack developers are often involved in deploying and maintaining the applications they build. This may involve setting up servers, configuring

deployment pipelines, monitoring application performance, and troubleshooting issues that arise in production environments.

FRONT END DEVELOPMENT

Front-end development focuses on building the user interface and user experience of a website or web application. It involves translating design mockups into code that users can interact with directly in their web browsers. Here's an overview of the key components and technologies involved in front-end development:

1. **HTML (Hypertext Markup Language) **: HTML is the standard markup language used to create the structure of web pages. It defines the layout and content of elements on a web page using tags such as `<div>`, `<p>`, `<h1>`.

2. **CSS (Cascading Style Sheets) **: CSS is used to style the visual presentation of HTML elements on a web page. It allows developers to control aspects like colors, fonts, spacing, and layout. CSS can be applied inline, embedded within HTML, or linked from external style sheets.

3. **JavaScript**: JavaScript is a powerful scripting language that adds interactivity and dynamic behavior to web pages. It is used to manipulate HTML and CSS, handle user input, create animations, fetch data from servers, and much more. Popular JavaScript libraries and frameworks include jQuery, React, Angular, Vue.js, and Ember.js.

4. **Responsive Web Design**: With the increasing variety of devices and screen sizes, it's essential to build websites that adapt and respond to different viewport sizes. Responsive web design techniques, such as using flexible layouts and media queries, ensure that web pages look good and function well on desktops, tablets, and smartphones.

5. **Browser Developer Tools**: Modern web browsers come with built-in developer tools that allow developers to inspect and debug HTML, CSS, and JavaScript code directly in the browser. These tools also provide performance profiling, network monitoring, and other helpful features for front-end development.

6. **Version Control Systems**: Version control systems like Git are essential tools for managing and collaborating on front-end codebases. They allow developers to track changes, revert to previous versions, and work on different branches of a project simultaneously.

7. **Build Tools and Task Runners**: Front-end development often involves tasks such as compiling Sass or Less into CSS, minifying and optimizing JavaScript code, and bundling assets for production. Build tools like Webpack, Gulp, and Grunt automate these tasks and streamline the development workflow.

8. **Web Accessibility**: Web accessibility ensures that web content is usable by everyone, regardless of disability or impairment. Front-end developers should follow best practices for semantic HTML, provide alternative text for images, and ensure keyboard navigation and screen reader compatibility.

Front-end development is a dynamic and rapidly evolving field, with new tools and techniques emerging regularly. Staying up-to-date with the latest trends and technologies is essential for front-end developers to create modern, engaging, and accessible web experiences.

BACK-END DEVELOPMENT

Back-end development involves building and maintaining the server-side logic and infrastructure of a web application. While front-end development focuses on the user interface and client-side interactions, back-end development handles the behind-the-scenes operations that enable the application to function. Here's an overview of the key components and technologies involved in back-end development:

1. **Server-Side Programming Languages**: Back-end developers use programming languages to write the logic that runs on the server and processes requests from clients. Common server-side languages include:

- **Node.js**: JavaScript runtime built on Chrome's V8 JavaScript engine, enabling developers to use JavaScript for both front-end and back-end development.

- **Python**: A versatile and easy-to-read language often used for web development, with popular frameworks like Django and Flask.

- **Ruby**: Known for its elegant syntax and developer-friendly ecosystem, with the Ruby on Rails framework being widely used for building web applications.

- **Java**: A robust and widely adopted language, especially for large-scale enterprise applications, often used with frameworks like Spring or Jakarta EE.

- **PHP**: A server-side scripting language commonly used for web development, powering popular platforms like WordPress and Drupal.

2. **Web Servers**: Web servers are software applications that handle incoming HTTP requests from clients (such as web browsers) and serve responses. Common web servers used in back-end development include Apache, Nginx, and Microsoft Internet Information Services (IIS).

3. **Databases**: Back-end developers work with databases to store and manage application data. There are various types of databases, including relational databases like MySQL, PostgreSQL, and Microsoft SQL Server, as well as NoSQL databases like MongoDB, Cassandra, and Firebase Firestore. Back-end developers need to understand database design, querying languages (e.g., SQL), and data modeling techniques.

4. **APIs (Application Programming Interfaces)**: APIs are used to define how different software components or systems communicate with each other. Back-end developers often create APIs to expose functionality and data from the server to the client-side code, allowing them to interact with the application's features programmatically.

5. **Authentication and Authorization**: Back-end developers implement mechanisms for user authentication (verifying user identities) and authorization (determining what actions users are allowed to perform). This often involves techniques like password hashing, session management, JSON Web Tokens (JWT), and OAuth for third-party authentication.

6. **Security**: Back-end developers are responsible for implementing security measures to protect the application against common threats like SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF), and other vulnerabilities. This includes input validation, data sanitization, encryption, and secure communication protocols like HTTPS.

7. **Middleware and Frameworks**: Middleware and frameworks provide pre-built components and abstractions that streamline back-end development. Examples include Express.js for Node.js, Django for Python, Ruby on Rails for Ruby, Spring Boot for Java, and Laravel for PHP.

8. **Deployment and Hosting**: Back-end developers deploy their applications to servers or cloud platforms to make them accessible over the internet. This involves setting up server environments, configuring databases, managing infrastructure, and ensuring scalability, availability, and performance.

Back-end development is essential for building robust and scalable web applications that can handle complex business logic, manage data efficiently, and provide secure and reliable services to users. Collaboration between front-end and back-end developers is crucial for delivering seamless and cohesive user experiences.

:

Some comprehensive books on antenna design may cover topics related to dual-band microstrip patch antennas. Look for titles by authors such as:

Constantine A. Balanis

Warren L. Stutzman and Gary A. Thiele
Robert S. Elliott

ResearchGate and Google Scholar:

These platforms can be useful for finding research papers, theses, and other scholarly works related to your topic. Researchers often share their publications on these platforms.

University Libraries:

University libraries often provide access to a wide range of academic journals and books. If you're affiliated with a university, check your library's catalog or consult with a librarian.

MONGO DB

MongoDB is a popular NoSQL (non-relational) database management system that is designed for flexibility, scalability, and performance. Unlike traditional relational databases like MySQL or PostgreSQL, MongoDB stores data in flexible, JSON-like documents, making it well-suited for handling unstructured or semi-structured data and for use cases where data schemas may evolve over time.

Here are some key features and characteristics of MongoDB:

1. **Document-Oriented**: MongoDB stores data in documents, which are JSON-like data structures composed of key-value pairs. These documents can have nested structures and arrays, allowing for more complex data models compared to relational databases.

2. **Schemaless**: MongoDB is schemaless, meaning that documents within a collection can have different structures and fields. This flexibility makes it easier to adapt to changing data requirements and iterate on application development without needing to modify a rigid schema.

3. **High Scalability**: MongoDB is designed to scale out horizontally across multiple servers or clusters, allowing it to handle large volumes of data and high traffic loads. It supports sharding, which involves distributing data across multiple shards (partitions), and replica sets, which provide high availability and data redundancy.

4. **Query Language**: MongoDB provides a powerful query language that supports a wide range of operations for reading, writing, updating, and deleting documents. The query language is based on JavaScript and includes features like aggregation pipelines, indexing, geospatial queries, and full-text search.

5. **Indexing**: MongoDB supports various types of indexes to optimize query performance, including single-field indexes, compound indexes (indexing multiple fields), geospatial indexes, text indexes, and others. Indexes can significantly improve query execution speed by enabling efficient data retrieval.

6. **Geospatial Capabilities**: MongoDB includes built-in support for geospatial queries and

indexing, making it well-suited for applications that require location-based features such as mapping, location tracking, and spatial analysis.

7. **Aggregation Framework**: MongoDB's aggregation framework allows developers to perform complex data transformations and analysis operations directly within the database. It provides a flexible and expressive syntax for grouping, filtering, sorting, and aggregating data, similar to SQL's GROUP BY and aggregate functions.

8. **JSON Data Format**: MongoDB's use of JSON-like documents makes it easy to work with data in modern web development environments, where JavaScript is the primary language. This alignment with JavaScript and other popular programming languages simplifies data manipulation and serialization/deserialization processes.

MongoDB is widely used in a variety of industries and applications, including e-commerce, social networking, content management systems, real-time analytics, Internet of Things (IoT), and more. Its flexibility, scalability, and developer-friendly features make it a popular choice for modern web and mobile applications that require flexible data storage solutions.

CODES

```
<!DOCTYPE html>

<html lang="en"
><head
><title>Spotless Hungry Crocodile</title
><meta name="viewport"
content="width=device-width, initial-scale=1.0"
/><meta charset="utf-8" /><meta property="twitter: card" content="summary_large_image"
/><style data-tag="reset-style-sheet">
html {l i n e -height: 1.15;} body {m a r g i n : 0;} * {b o x -sizing: border-box;  border-width:
0;  border-style: solid;} p, li,ul,pre,div,h1,h2,h3,h4,h5,h6,figure,blockquote,figcaption {  margin: 0;
padding: 0;}button {  background-color: transparent;}button,input,optgroup,select,textarea
{  font-family: inherit;  font-size: 100%;  line-height: 1.15;  margin: 0;}button,select {  text-
transform: none;}button,[type="button"],[type="reset"],[type="submit"] {  -webkit-appearance:
button;}button::-moz-focus-inner,[type="button"]::-moz-focus-inner,[type="reset"]::-moz-focus-
inner,[type="submit"]::-moz-focus-inner {  border-style: none;  padding: 0;}button:-moz-
focus,[type="button"]:-moz-focus,[type="reset"]:-moz-focus,[type="submit"]:-moz-focus
{o u t l i n e : 1px dotted Button Text;}a {  color: inherit;  text-decoration: inherit;}input {  padding:
2px 4px;}img {  display: block;}html { scroll-behavior: smooth  }</style
><style data-tag="default-style-sheet"> html {
font-family: Inter; font-size: 16px;
}

body {
font-weight: 400; font-style: normal; text-decoration: none; text-transform: none;
letter-spacing: normal;
```

```
line-height: 1.15;
color: var(--dl-color-gray-black);
background-color: var(--dl-color-gray-white);

}</style
><link rel="stylesheet"
href="https://unpkg.com/animate.css@4.1.1/animate.css"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Inter:wght@100;200;300;400;500;600;700;8
00;900&display=swap"
data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Lato" data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Lato:ital,wght@0,100;0,300;0,400;0,700;0,9
00;1,100;1,300;1,400;1,700;1,900&display=swap"
data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Raleway:ital,wght@0,100;0,200;0,300;0,400;
0,500;0,600;0,700;0,800;0,900;1,100;1,200;1,300;1,400;1,500;1,600;1,700;1,800;1,900&display=
swap"
data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Inter:wght@100;200;300;400;500;600;700;8
00;900&display=swap"
data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Raleway" data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Inter:wght@100;200;300;400;500;600;700;8
00;900&display=swap"
data-tag="font"
/><link rel="stylesheet"
```

href="https://fonts.googleapis.com/css2?family=Raleway:ital,wght@0,100;0,200;0,300;0,400;
0,500;0,600;0,700;0,800;0,900;1,100;1,200;1,300;1,400;1,500;1,600;1,700;1,800;1,900&display=
swap"
data-tag="font"
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0,500;0,600;0,700;0,800;0,900;1,100;1,200;1,300;1,400;1,500;1,600;1,700;1,800;1,900&display=
swap"
data-tag="font"
/><link rel="stylesheet"
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00;1,100;1,300;1,400;1,700;1,900&display=swap"
data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Lato:ital,wght@0,100;0,300;0,400;0,700;0,9
00;1,100;1,300;1,400;1,700;1,900&display=swap"
data-tag="font"
/><link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Raleway:ital,wght@0,100;0,200;0,300;0,400;
0,500;0,600;0,700;0,800;0,900;1,100;1,200;1,300;1,400;1,500;1,600;1,700;1,800;1,900&display=
swap"
data-tag="font"
/><link rel="stylesheet"
href="https://unpkg.com/@teleporthq/teleport-custom-scripts/dist/style.css"
/><style>
@keyframes fade-in-left { 0% {
opacity: 0;
transform: translateX(-20px);
} 100% {
opacity: 1;
transform: translateX(0);
}
}
</style></head

```
  ><body
><div id="app"></div
><script
data-section-id="navbar" src="https://unpkg.com/@teleporthq/teleport-custom-scripts"

  ></script></body
></html>
```

CSS CODE

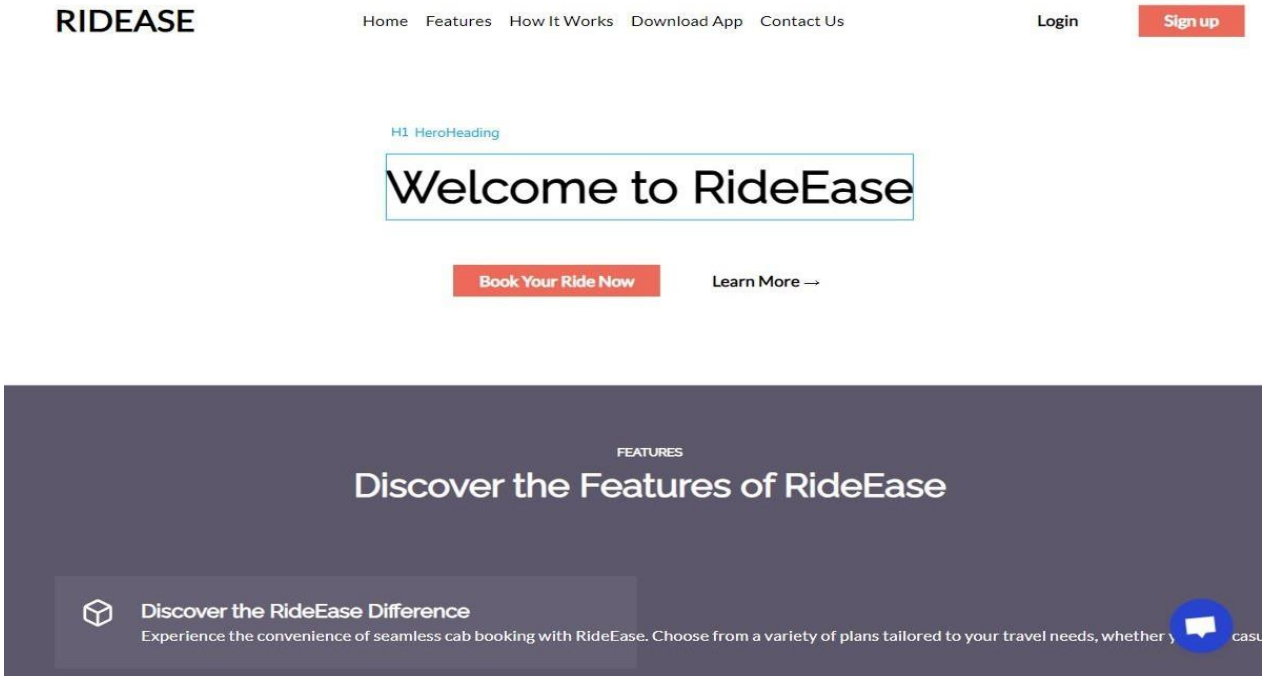
```
. App {
text-align: center;
}

.App-logo { height: 40vmin;
pointer-events: none;
}

@media (prefers-reduced-motion: no-preference) {
.App-logo {
animation: App-logo-spin infinite 20s linear;
}
}

.App-header {
background-color: #282c34; min-height: 100vh;
display: flex;
flex-direction: column; align-items: center; justify-content: center;
font-size: calc(10px + 2vmin); color: white;
}

.App-link { color: #61dafb;
}

@keyframes App-logo-spin { from {
transform: rotate(0deg);
}
to {
transform: rotate(360deg);
}
}
```

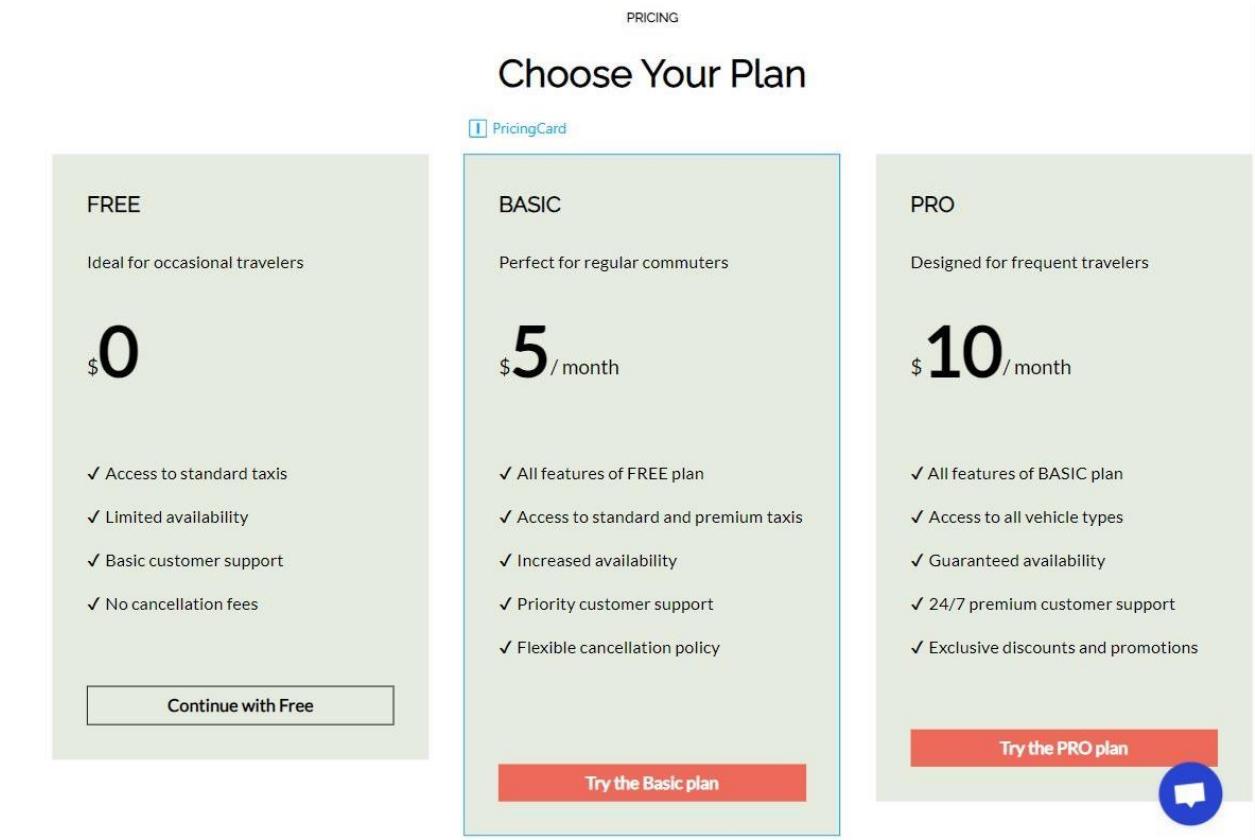
JAVA CODE

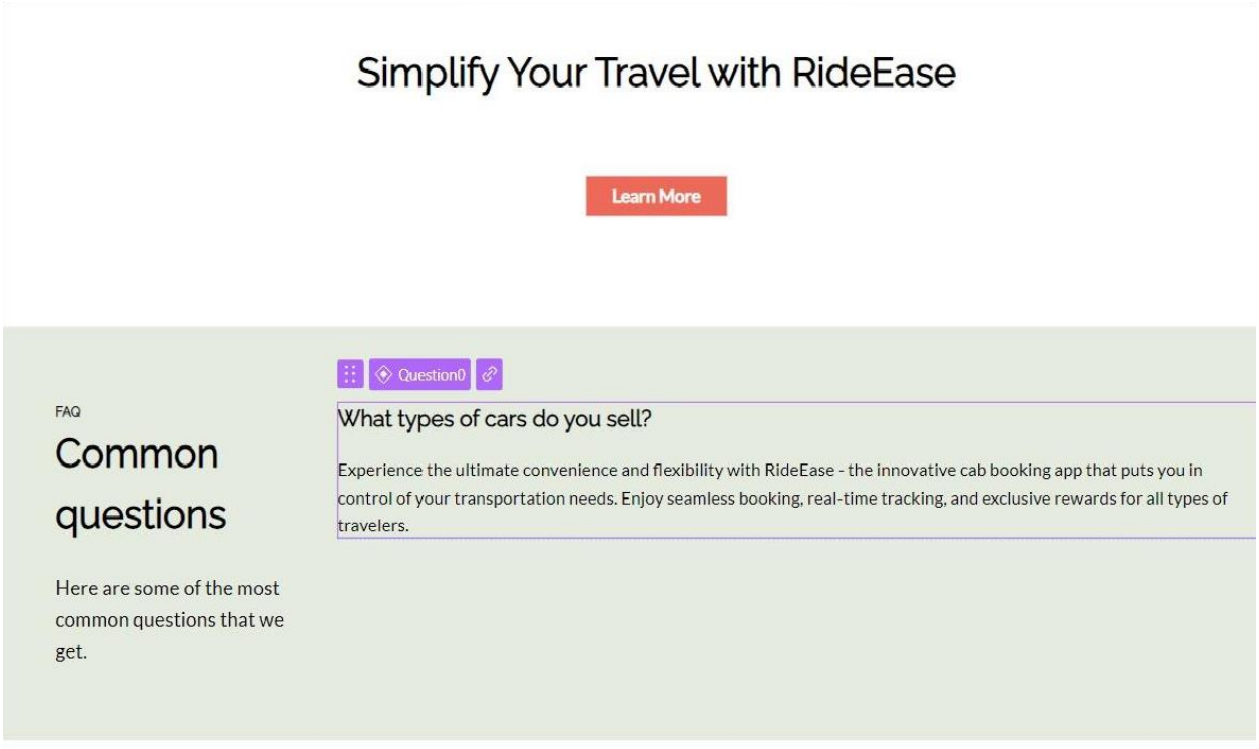
```
import './App.css';
import 'bootstrap/dist/css/bootstrap.min.css';

import Login from './User/Login'; import Navbar from './User/Unav';
import SelectRide from './User/SelectRide'; import Cabs from './User/Cabs';
import Bookcab from './User/Bookcab'; import Addcar from './Admin/Addcar';
import Mybookings from './User/Mybookings';

import { BrowserRouter, Routes,Route } from 'react-router-dom'; import Register from
'./User/Register';
import Home from './Components/Home'; import Alogin from './Admin/Alogin'; import Users from
'./Admin/Users'; import Anav from './Admin/Anav';
import Bookings from './Admin/Bookings'; import UserEdit from './Admin/UserEdit'; import Ahome
from './Admin/Ahome'; import Acabs from './Admin/Acabs'; import Acabedit from
'./Admin/Acabedit'; import Uhome from './User/Uhome';

function App() { return (
<div className="App">
<BrowserRouter>
<Routes>

{/* <Route path='/' element={<Home/>}/> */}
<Route path='/' element={<Login/>} />
<Route path='/signup' element={<Register/>} />
{/* <Route path='/unav' element={<Unav/>} /> */}

{/* Admin */}
<Route path='/alogin' element={<Alogin/>}/>
<Route path='/anav' element={<Anav/>} />
<Route path='/ahome' element={<Ahome/>} />
<Route path='/users' element={<Users/>} />
<Route path="/useredit/:id" element={<UserEdit/>}/>
<Route path='/bookings' element={<Bookings/>} />
```

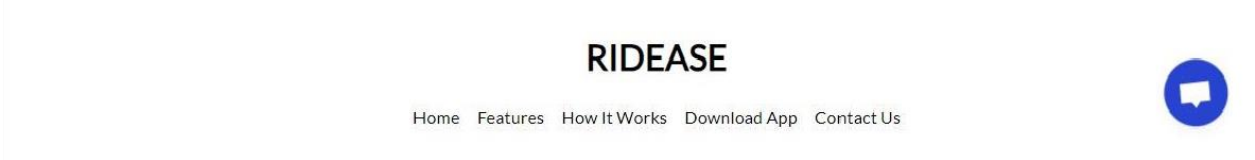
```
<Route path='/acabs' element={<Acabs/>}/>
<Route path="'/acabedit/:id" element={<Acabedit/>}/>
<Route path='/addcab' element={<Addcar/>} />

{/* user           */}
<Route path='/uhome' element={<Uhome/>}/>
<Route path='/ucabs' element={<Cabs/>}/>
<Route path='/bookcab/:id' element={<Bookcab/>}/>
<Route path='/mybookings' element={<Mybookings/>}/>
</Routes>
</BrowserRouter>

</div>
);
}

export default App;
```

RESULT


RIDEASE
Home
Features
How It Works
Download App
Contact Us
Login
Sign up
H1 HeroHeading
Welcome to RideEase
Book Your Ride Now
Learn More →
FEATURES
Discover the Features of RideEase
Discover the RideEase Difference
Experience the convenience of seamless cab booking with RideEase. Choose from a variety of plans tailored to your travel needs, whether


PRICING
Choose Your Plan
PricingCard
FREE
Ideal for occasional travelers
$0
✓ Access to standard taxis
✓ Limited availability
✓ Basic customer support
✓ No cancellation fees
Continue with Free
BASIC
Perfect for regular commuters
$5 / month
✓ All features of FREE plan
✓ Access to standard and premium taxis
✓ Increased availability
✓ Priority customer support
✓ Flexible cancellation policy
Try the Basic plan
PRO
Designed for frequent travelers
$ 10 / month
✓ All features of BASIC plan
✓ Access to all vehicle types
✓ Guaranteed availability
✓ 24/7 premium customer support
✓ Exclusive discounts and promotions
Try the PRO plan


Simplify Your Travel with RideEase
Learn More
FAQ
Common questions
Here are some of the most common questions that we get.
Question0
What types of cars do you sell?
Experience the ultimate convenience and flexibility with RideEase - the innovative cab booking app that puts you in control of your transportation needs. Enjoy seamless booking, real-time tracking, and exclusive rewards for all types of travelers.


RIDEASE
Home Features How It Works Download App Contact Us