

ASCENDION

Capstone Project

Personal BACKGROUND

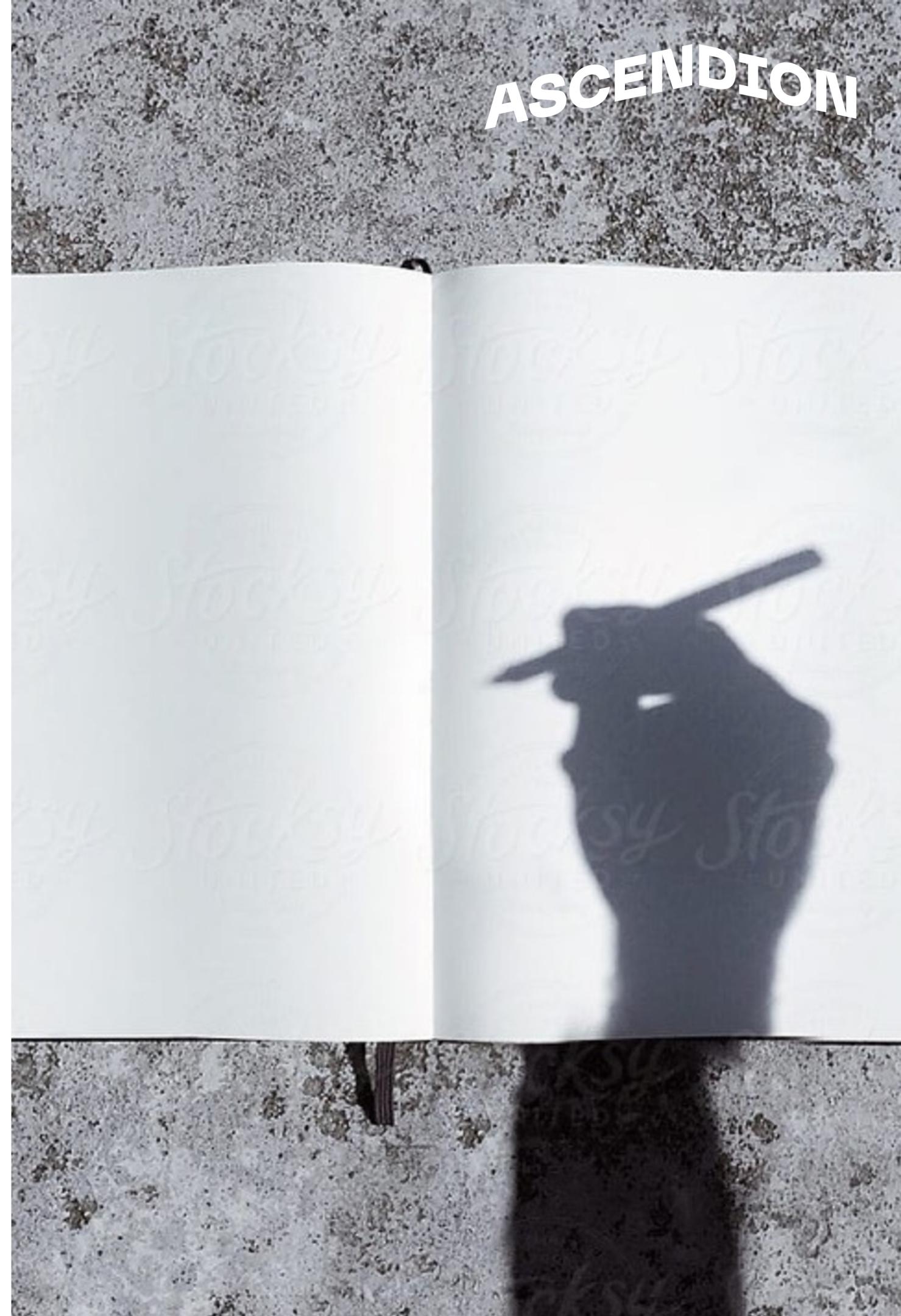
(Name, Past Experience, Qualification, Career Summary)

Name :Madugula Ranjith

Past Experience :
Fresher

Qualification :
BE

**Career Summary : I am a student recently joined
Ascendion as Fresher**



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Key Takeaways/Learnings from the Program

During this training program, I gained strong foundations in engineering concepts, web technologies, and professional skills.

I learned the importance of architecture and design patterns to build scalable applications.

Through mini projects, I applied my learning in practical scenarios and built confidence.

On the frontend, I developed skills in React fundamentals, advanced React patterns, and performance optimization.

I also gained expertise in Angular 17 and advanced Angular development for building dynamic web applications.

On the backend, I explored REST API development and GraphQL for efficient data communication.

I strengthened my knowledge of full-stack development fundamentals and modern technologies.

The program also taught me advanced concepts like complex application architecture and feature implementation



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Key Takeaways/Learnings from the Program

I improved my workplace writing, communication, and assertive presentation skills

I also learned the value of professional presence, branding, and problem-solving with purpose-driven thinking.

Enterprise project planning sessions gave me insights into real-world project execution.

Innovation and modern technology training helped me stay industry-relevant.

Finally, I worked on a capstone project, where I applied frontend, backend, and API skills to deliver a complete solution.

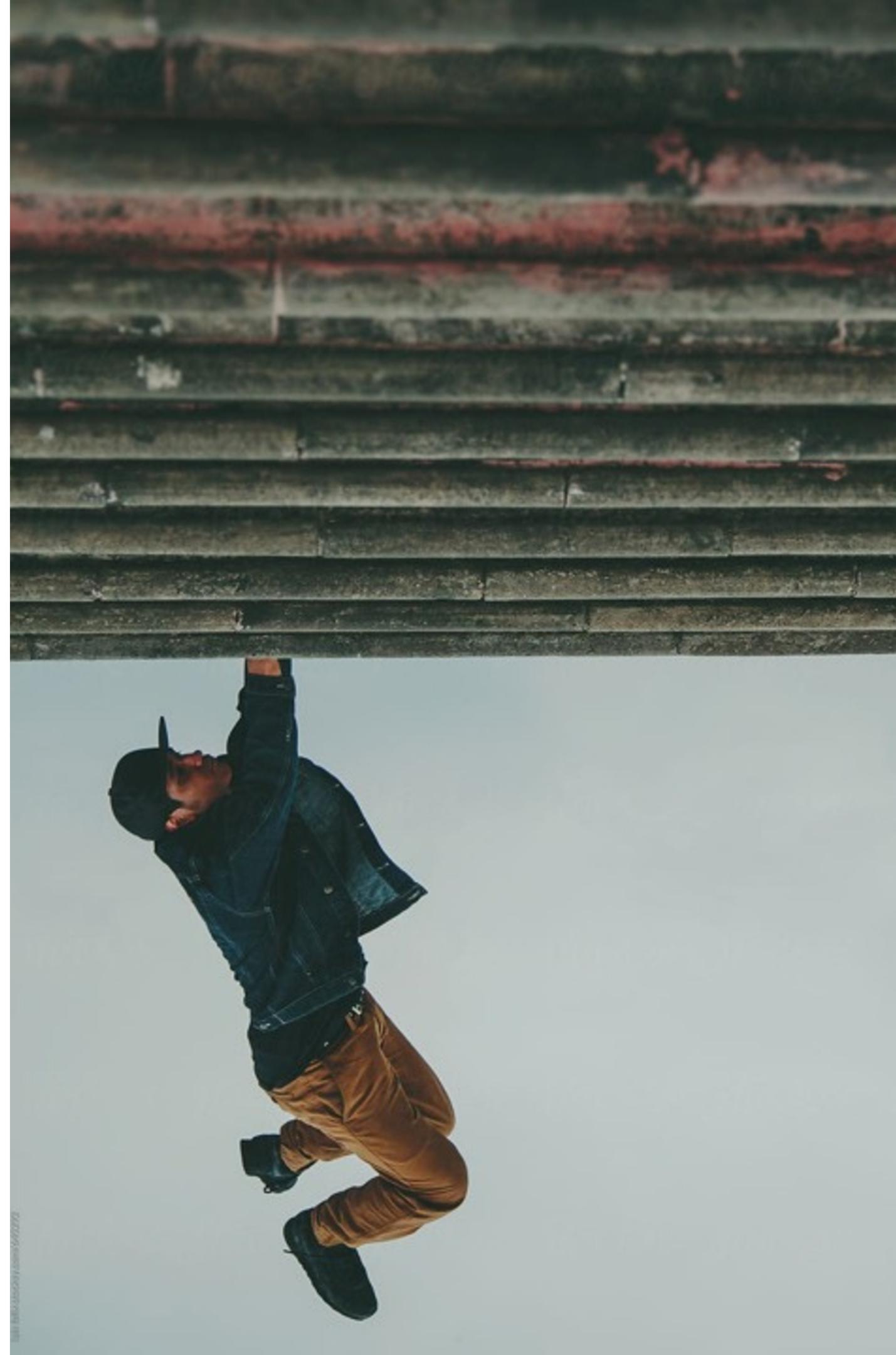
Overall, this program helped me grow as a well-rounded student, combining technical expertise with professional development.



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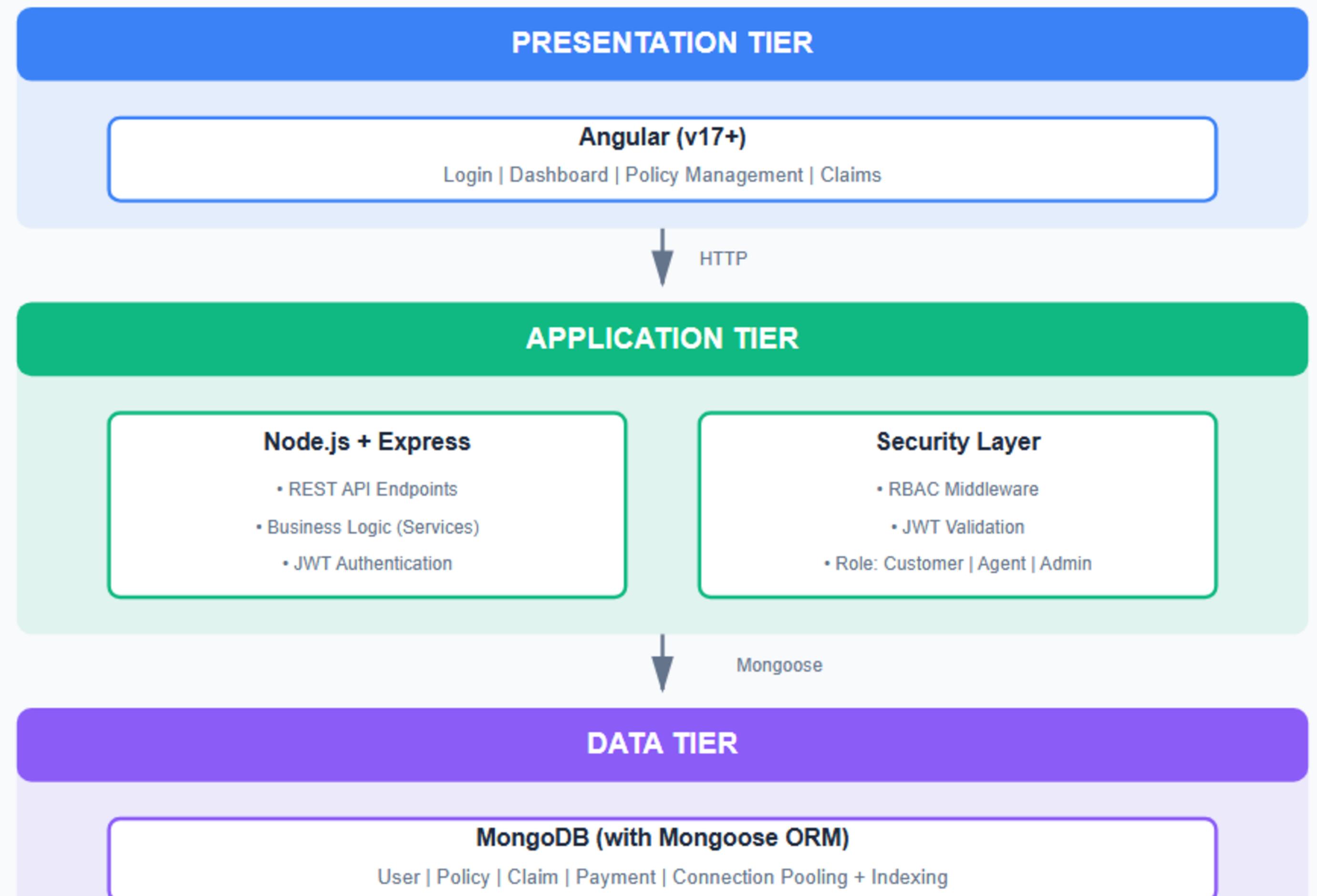
Problem Statement of the Capstone Project

To develop a secure, scalable multi-user Insurance Application with the MEAN stack, leverage its unified JavaScript environment to share validation and business logic across frontend (Angular) and backend (Node.js/Express). Use immutable policy versioning in MongoDB to preserve data integrity, creating a new document for each policy update and enforcing constraints via Mongoose hooks. Implement granular Role-Based Access Control (RBAC) through centralized role-permission mapping, server-side middleware, and Angular route guards to manage customer, agent, and admin permissions. Ensure backend stability when executing heavy actuarial or financial logic by offloading CPU-intensive tasks to worker threads or microservices, using async operations, caching frequently accessed data with Redis, and applying rate limiting. Secure sensitive data through encryption, maintain audit logs for compliance, and optimize performance with MongoDB sharding, Node.js's non-blocking I/O, and modular Angular architecture. This approach guarantees data integrity, security, and responsive performance across multiple concurrent users while keeping the system maintainable and scalable.



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Architecture



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Important areas of the Project with screenshots

Signup



About Register Contact Login

Sign Up

Name

Email

Password

Role

Register

Login



About Register Contact Login

Login

Login to continue to SafeGuard

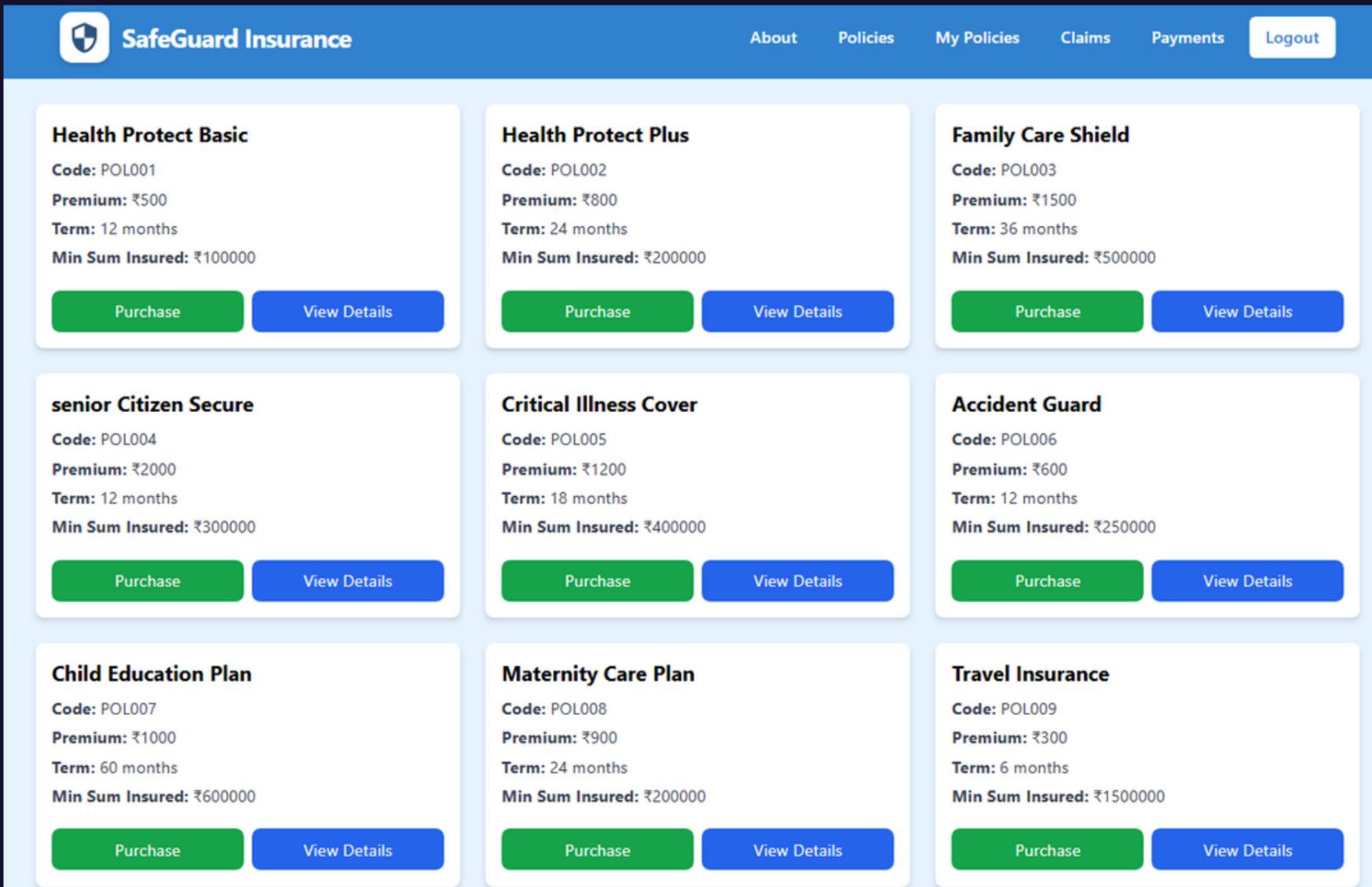
Email

Password

Login

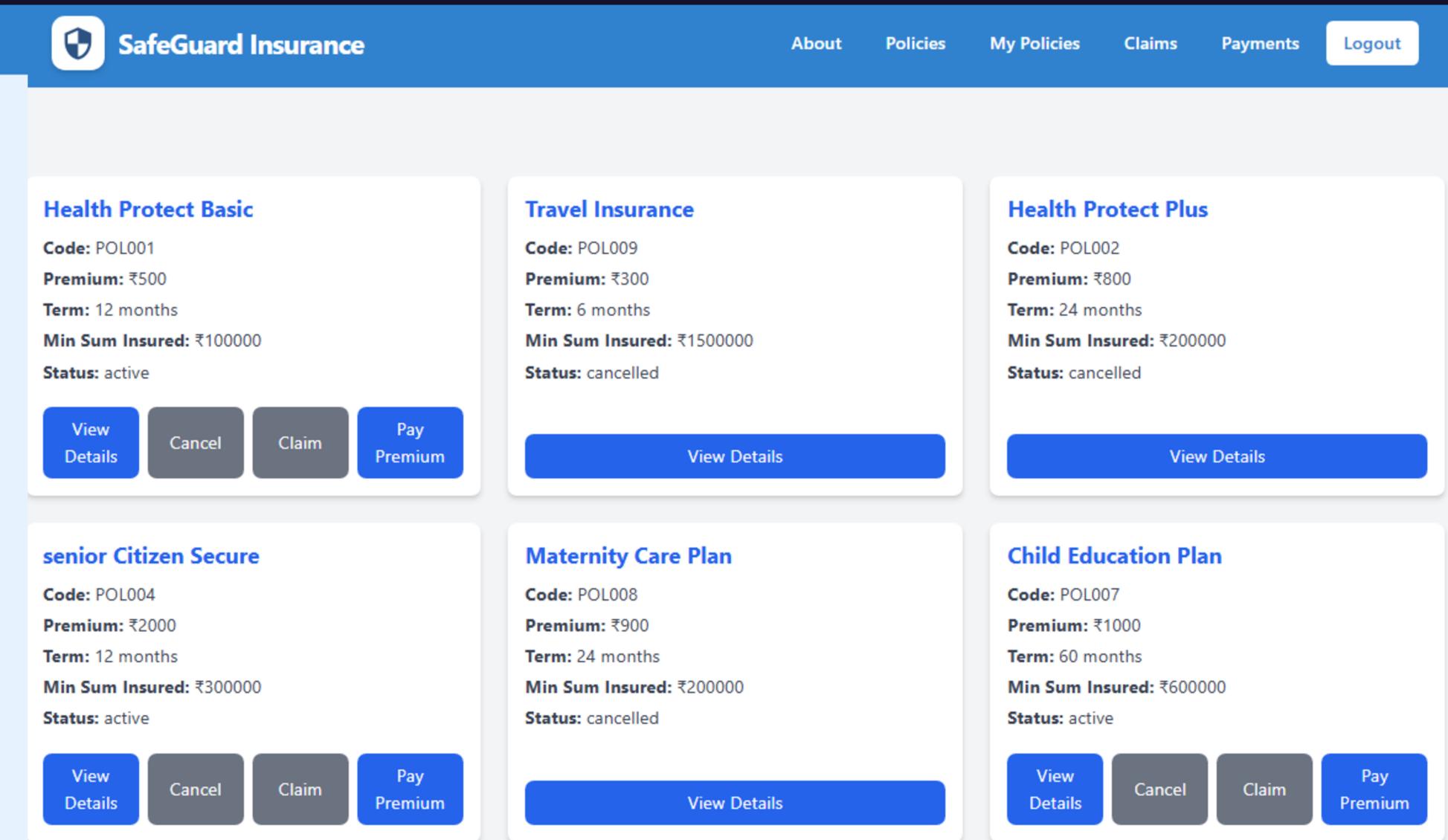
Create Account

Important areas of the Project with screenshots



SafeGuard Insurance

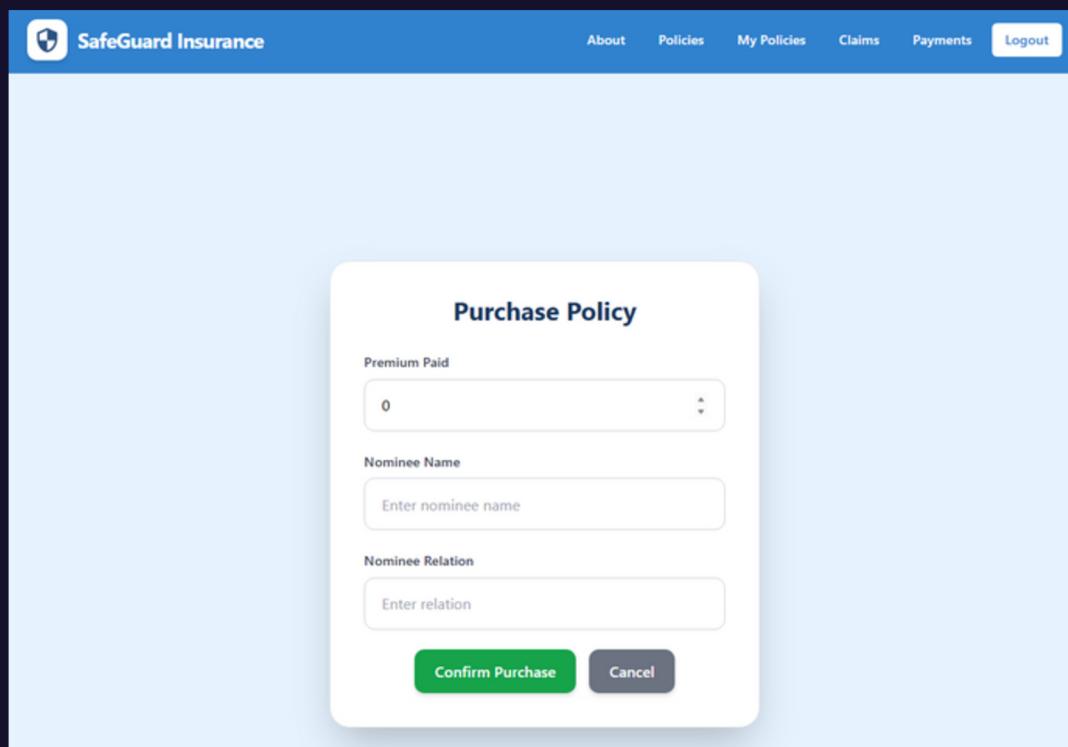
- Health Protect Basic**
Code: POL001
Premium: ₹500
Term: 12 months
Min Sum Insured: ₹100000
[Purchase](#) [View Details](#)
- Health Protect Plus**
Code: POL002
Premium: ₹800
Term: 24 months
Min Sum Insured: ₹200000
[Purchase](#) [View Details](#)
- Family Care Shield**
Code: POL003
Premium: ₹1500
Term: 36 months
Min Sum Insured: ₹500000
[Purchase](#) [View Details](#)
- senior Citizen Secure**
Code: POL004
Premium: ₹2000
Term: 12 months
Min Sum Insured: ₹300000
[Purchase](#) [View Details](#)
- Critical Illness Cover**
Code: POL005
Premium: ₹1200
Term: 18 months
Min Sum Insured: ₹400000
[Purchase](#) [View Details](#)
- Accident Guard**
Code: POL006
Premium: ₹600
Term: 12 months
Min Sum Insured: ₹250000
[Purchase](#) [View Details](#)
- Child Education Plan**
Code: POL007
Premium: ₹1000
Term: 60 months
Min Sum Insured: ₹600000
[Purchase](#) [View Details](#)
- Maternity Care Plan**
Code: POL008
Premium: ₹900
Term: 24 months
Min Sum Insured: ₹200000
[Purchase](#) [View Details](#)
- Travel Insurance**
Code: POL009
Premium: ₹300
Term: 6 months
Min Sum Insured: ₹1500000
[Purchase](#) [View Details](#)



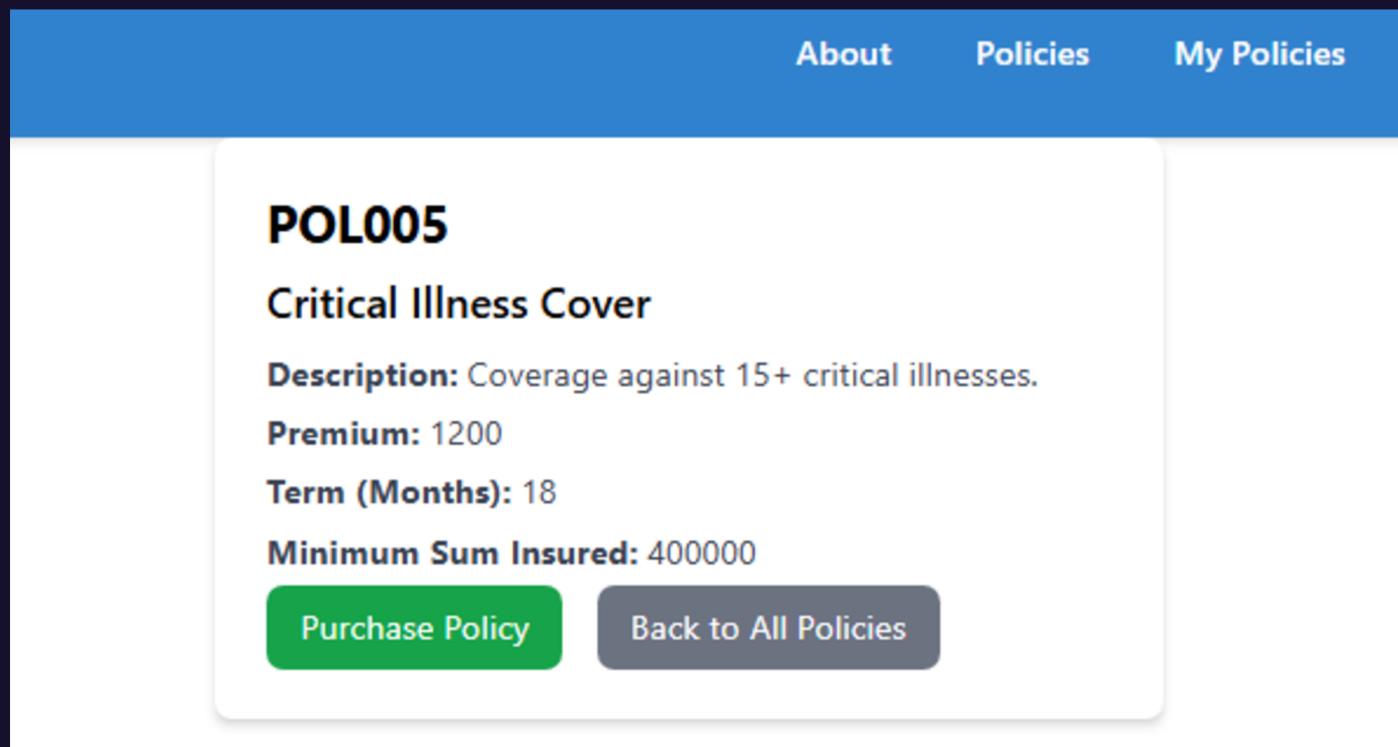
SafeGuard Insurance

- Health Protect Basic**
Code: POL001
Premium: ₹500
Term: 12 months
Min Sum Insured: ₹100000
Status: active
[View Details](#) [Cancel](#) [Claim](#) [Pay Premium](#)
- Travel Insurance**
Code: POL009
Premium: ₹300
Term: 6 months
Min Sum Insured: ₹1500000
Status: cancelled
[View Details](#)
- Health Protect Plus**
Code: POL002
Premium: ₹800
Term: 24 months
Min Sum Insured: ₹200000
Status: cancelled
[View Details](#)
- senior Citizen Secure**
Code: POL004
Premium: ₹2000
Term: 12 months
Min Sum Insured: ₹300000
Status: active
[View Details](#) [Cancel](#) [Claim](#) [Pay Premium](#)
- Maternity Care Plan**
Code: POL008
Premium: ₹900
Term: 24 months
Min Sum Insured: ₹200000
Status: cancelled
[View Details](#)
- Child Education Plan**
Code: POL007
Premium: ₹1000
Term: 60 months
Min Sum Insured: ₹600000
Status: active
[View Details](#) [Cancel](#) [Claim](#) [Pay Premium](#)

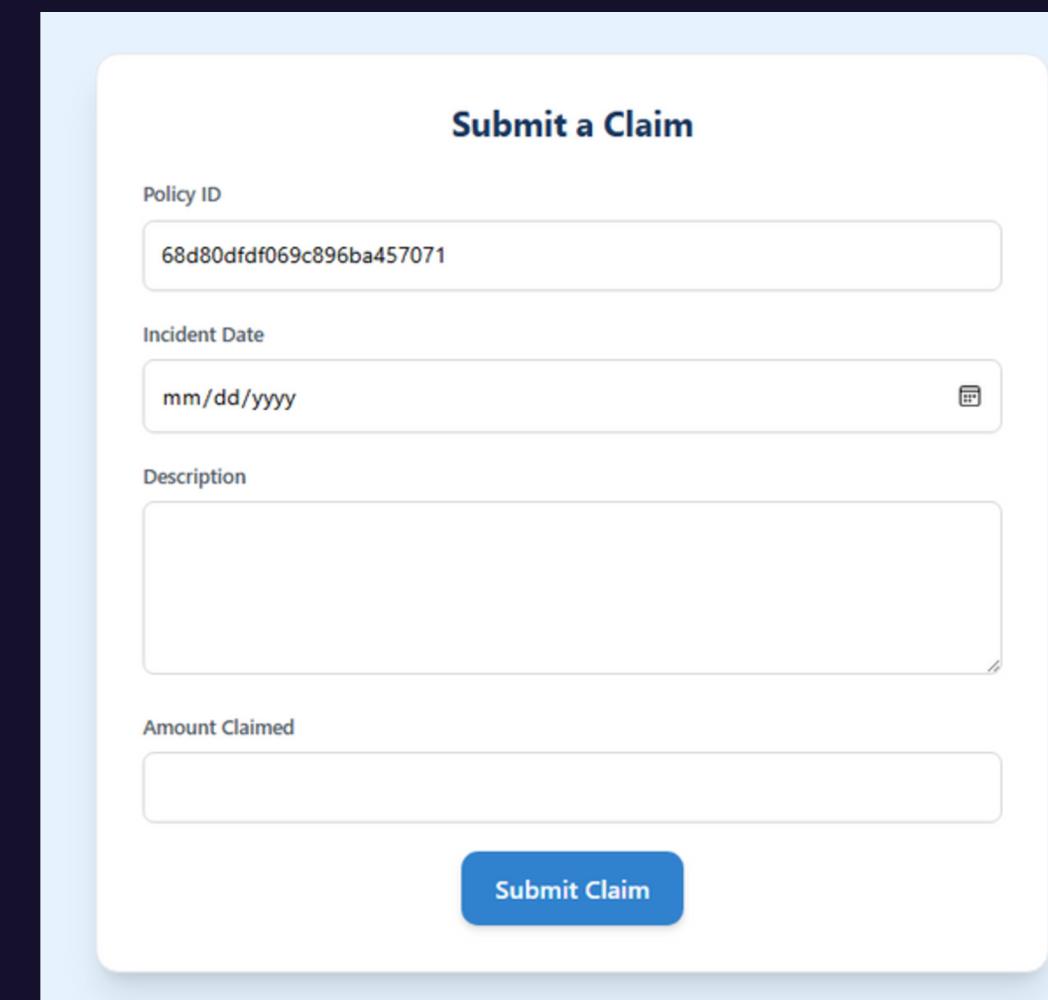
Important areas of the Project with screenshots



A screenshot of the 'Purchase Policy' form. The form has a light blue header with the SafeGuard Insurance logo and navigation links: About, Policies, My Policies, Claims, Payments, and Logout. The main content area is titled 'Purchase Policy' and contains fields for 'Premium Paid' (with a dropdown menu showing '0'), 'Nominee Name' (with a placeholder 'Enter nominee name'), 'Nominee Relation' (with a placeholder 'Enter relation'), and two buttons at the bottom: 'Confirm Purchase' (green) and 'Cancel' (grey).



A screenshot of a policy details page. The top navigation bar includes 'About', 'Policies', and 'My Policies'. The main content shows a policy named 'POL005' with the title 'Critical Illness Cover'. It provides a description ('Coverage against 15+ critical illnesses.'), premium ('1200'), term ('18 months'), and minimum sum insured ('400000'). At the bottom are 'Purchase Policy' and 'Back to All Policies' buttons.



A screenshot of the 'Submit a Claim' form. The header says 'Submit a Claim'. It includes fields for 'Policy ID' (containing '68d80dfdf069c896ba457071'), 'Incident Date' (placeholder 'mm/dd/yyyy'), 'Description' (text area), and 'Amount Claimed' (text area). A large blue 'Submit Claim' button is at the bottom right.

Important areas of the Project with screenshots

SafeGuard Insurance

About Policies My Policies Claims Payments Logout

Your Claims

Claim ID	Policy ID	Incident Date	Description	Amount Claimed	Status
68d91b99298edf30f27098ea	2025-09-11	dog bite	₹10000	approved	2025-09-28 16:57
68d91bd13b3d5b607ce0f6f1	2025-09-11	dog bite	₹10000	approved	2025-09-28 16:58
68d91be6ad94d336c37a45a0	2025-09-11	dog bite	₹10000	approved	2025-09-28 16:58
68d961eac37ffc465dfeebef	2025-09-12	Accidental	₹50000	approved	2025-09-28 21:57
68d96201c37ffc465dfeebf3	2025-09-12	Accidental	₹50000	approved	2025-09-28 21:57
68d962b52bd2c3bc7fa5d520	2025-09-17	accidental	₹1200	approved	2025-09-28 22:00
68d963361388aca037f5cc8e	2025-09-17	accidental	₹1200	pending	2025-09-28 22:02
68d9671d045a758dcadf5be0	2025-09-05	house	₹10000	approved	2025-09-28 22:19
68da23756b8c84e9df3408e3	2025-09-17	y7oijuo	₹10000	approved	2025-09-29 11:43
68da23dc6b8c84e9df340907	2025-09-11	uhihpojo	₹2000	approved	2025-09-29 11:44
68da23ee6b8c84e9df34091a	2025-09-18	oijpijpo	₹10000	approved	2025-09-29 11:45
68da24066b8c84e9df34092d	2025-09-12	upo[pk	₹20000	approved	2025-09-29 11:45
68da242c6b8c84e9df340940	2025-09-13	ihjpoko	₹30000	approved	2025-09-29 11:46
68db5b9265ea9eadedf1ea03	2025-09-05	accident	₹10000	pending	2025-09-30 09:54

SafeGuard Insurance

About Policies My Policies Claims Payments Logout

My Payments

Reference	Amount	Method	Date
hieo	₹1000	card	9/28/25, 7:15 PM
hello	₹1000	card	9/28/25, 7:16 PM
h34	₹2000	card	9/28/25, 7:17 PM
huop	₹3000	card	9/28/25, 7:17 PM
tyio	₹3000	card	9/28/25, 7:19 PM
ty	₹3000	card	9/28/25, 7:19 PM
234	₹3000	card	9/28/25, 7:20 PM
uiop	₹3000	card	9/28/25, 7:20 PM
huoplmlm	₹4000	card	9/28/25, 7:23 PM
iojop	₹1000	card	9/29/25, 11:49 AM

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Important areas of the Project with screenshots

Claims

This screenshot shows a list of assigned customers. The header includes the SafeGuard Insurance logo, navigation links for About, customers, Claims, and Logout, and a search bar. The main section is titled 'Customers Assigned to You' and lists one customer: 'customer1' with email 'customer1@gmail.com'. A 'View Policies' button is located at the bottom right of the list.

Name	Email	Actions
customer1	customer1@gmail.com	View Policies

This screenshot shows a list of assigned claims. The header includes the SafeGuard Insurance logo, navigation links for About, customers, Claims, and Logout, and a search bar. The main section is titled 'Assigned Claims' and displays a table with the following data:

Claim ID	User	Policy ID	Incident Date	Amount Claimed	Status	Actions
68d9671d045a758dcadf5be0	9/5/25	₹10000	approved	Approve Reject		
68da23756b8c84e9df3408e3	9/17/25	₹10000	approved	Approve Reject		
68da23dc6b8c84e9df340907	9/11/25	₹2000	approved	Approve Reject		
68da23ee6b8c84e9df34091a	9/18/25	₹10000	approved	Approve Reject		
68da24066b8c84e9df34092d	9/12/25	₹20000	approved	Approve Reject		
68da242c6b8c84e9df340940	9/13/25	₹30000	approved	Approve Reject		
68db5b9265ea9eadeedf1ea03	9/5/25	₹10000	pending	Approve Reject		

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Important areas of the Project with screenshots

Dashboards

The image displays two screenshots of the SafeGuard Insurance application interface.

Admin Dashboard: This dashboard provides an overview of key performance metrics. It includes cards for Users (7), Policies Sold (8), Pending Claims (2), Total Payments (₹24000), Total Claims (13), Total Agents (3), Policy Management, Agent Management, User Management, Claims Management, Payments, and Audit.

Name	Email	Policies	Assign Policy
agent5	agent@gmail.com		<input type="button" value="View Policies"/> <input type="button" value="Assign"/>
agent 6	agent6@gmail.com		<input type="button" value="View Policies"/> <input type="button" value="Assign"/>
agnet7	agent7@gmail.com		<input type="button" value="View Policies"/> <input type="button" value="Assign"/>

Agent Management: This screen shows the creation of a new agent and a list of all agents. It includes fields for Name, Email, and Password, and a 'Create Agent' button. The 'All Agents' table lists three agents: agent5, agent 6, and agnet7, each with a 'View Policies' button and an 'Assign' dropdown menu.

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Important areas of the Project with screenshots

customers

The screenshot displays the Admin Dashboard of the SafeGuard Insurance application. The top navigation bar includes links for About, Policies, Agents, Customers, Claims, Payments, and Logout. The main content area is divided into two sections: "Customer Management" and "Pending Claims".

Customer Management: This section shows a table of all customers. Each customer entry includes their name, email, and a "View Policies" button.

Name	Email	Policies
abcd	abcd@gmaiil.com	<button>View Policies</button>
customer1	customer1@gmail.com	<button>View Policies</button>
customer2	customer2@gmail.com	<button>View Policies</button>

Pending Claims: This section shows a table of pending claims. Each row includes the customer, amount, description, status, and action buttons for approval or update.

Customer	Amount	Description	Status	Action
customer1	₹1200	accidental	pending	<button>Approve</button> <button>Update</button>
customer1	₹10000	accident	pending	<button>Approve</button> <button>Update</button>

All Claims: This section shows a table of all claims, including customer, amount, description, status, and the user who decided it.

Customer	Amount	Description	Status	Decided By
customer1	₹10000	dog bite	approved	admin
customer1	₹10000	dog bite	approved	admin
customer1	₹10000	dog bite	approved	admin
customer1	₹50000	Accidental	approved	admin
customer1	₹50000	Accidental	approved	admin
customer1	₹1200	accidental	approved	admin
customer1	₹1200	accidental	pending	-
customer1	₹10000	house	approved	agent5
customer1	₹10000	y7oijuo	approved	agent5
customer1	₹2000	uhihpojo	approved	agent5

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Important areas of the Project with screenshots

Payment Audit Logs

Payments			
Amount (₹)	Method	Reference	Date
₹1000	card	hieo	9/28/25, 7:15 PM
₹1000	card	hello	9/28/25, 7:16 PM
₹2000	card	h34	9/28/25, 7:17 PM
₹3000	card	huop	9/28/25, 7:17 PM
₹3000	card	tyio	9/28/25, 7:19 PM
₹3000	card	ty	9/28/25, 7:19 PM
₹3000	card	234	9/28/25, 7:20 PM
₹3000	card	uiop	9/28/25, 7:20 PM
₹4000	card	huoplmlm	9/28/25, 7:23 PM
₹1000	card	iojop	9/29/25, 11:49 AM

Timestamp	Action	Actor	IP	Details
9/30/25, 9:54 AM	Claim Submitted	[object Object]	::1	{ "claimID": "68db5b9265ea9eadeedf1ea03", "approvedBy": "68d7ec21f471af91f0d65732", "assignedAgentId": " ", "amountClaimed": 10000, "role": "customer" }
9/30/25, 9:46 AM	Policy status Updated	[object Object]	::1	{ "claimID": "68d962b52bd2c3bc7fa5d520", "status": "approved", "assignedAgentId": " ", "amountClaimed": 1200, "approvedBy": "68d6bad41d206fa19cc78bc8", "role": "admin" }
9/30/25, 9:23 AM	Claim Submitted	[object Object]	::1	{ "claimID": "68db542bb5a9e220aaef43ed", "approvedBy": "68db52f2443ae7f9950b653b", "assignedAgentId": " ", "amountClaimed": 10000, "role": "customer" }

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Testing Areas

End To End Testing

9/30/2023, 12:29:29 PM Total time: 1.7m		
example.spec.ts		
✓ E2E Login and Navbar Tests > Customer login should show customer navbar links	chromium	1.5s
example.spec.ts:10		
✓ E2E Login and Navbar Tests > Customer login invalid credentials	chromium	1.4s
example.spec.ts:30		
✓ E2E Login and Navbar Tests > Agent login should show agent navbar links	chromium	1.6s
example.spec.ts:43		
✓ E2E Login and Navbar Tests > Agent login invalid credentials	chromium	1.3s
example.spec.ts:61		
✓ E2E Login and Navbar Tests > Admin login should show admin navbar links	chromium	2.1s
example.spec.ts:74		
✓ E2E Login and Navbar Tests > Admin login invalid credentials	chromium	2.1s
example.spec.ts:95		
✓ E2E Login and Navbar Tests > Redirect to login when accessing customer page without login	chromium	858ms
example.spec.ts:108		
✓ E2E Login and Navbar Tests > Redirect to login when accessing agent page without login	chromium	2.0s
example.spec.ts:113		
✓ E2E Login and Navbar Tests > Redirect to login when accessing admin page without login	chromium	1.6s
example.spec.ts:118		
✓ E2E Login and Navbar Tests > Customer cannot see agent/admin links	chromium	2.5s
example.spec.ts:123		
✓ E2E Login and Navbar Tests > Customer login should show customer navbar links	firefox	13.2s
example.spec.ts:10		
✓ E2E Login and Navbar Tests > Customer login invalid credentials	firefox	12.1s
example.spec.ts:30		
✓ E2E Login and Navbar Tests > Agent login should show agent navbar links	firefox	11.5s
example.spec.ts:43		
✓ E2E Login and Navbar Tests > Agent login invalid credentials	firefox	7.7s
example.spec.ts:61		
✓ E2E Login and Navbar Tests > Admin login should show admin navbar links	firefox	10.2s

SignupComponent

- should handle empty form submission
- should call register() and store token, role, name, userId
- should navigate to admin if role is admin
- should navigate to agent if role is agent
- should create SignupComponent
- should have empty initial values
- should bind input fields with ngModel

LoginComponent (standalone)

- should bind email and password with ngModel
- should call AuthService.login and navigate to /customer if role is customer
- should have email and password input fields
- should call login() when Login button is clicked
- should create the component
- should render login title
- should have a Create Account link pointing to /register

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Conclusion

- This Insurance Management Web Application successfully demonstrates a robust, scalable three-tier architecture built with modern web technologies. By leveraging Angular for a responsive frontend, Node.js with Express for secure API services, and MongoDB for efficient data persistence, the system delivers a comprehensive solution for managing policies, claims, and payments.
- The implementation of JWT-based authentication and Role-Based Access Control ensures secure access across customer, agent, and admin roles. The stateless backend design enables horizontal scaling to handle growing user demands, while Mongoose optimization with connection pooling and indexing guarantees optimal database performance.
- Supported by rigorous testing practices using Playwright and Jasmine/Karma, along with CI/CD automation through GitHub Actions, the application maintains high code quality and reliability. The RESTful API design, documented through Postman, ensures maintainability and ease of integration.
- This project showcases best practices in full-stack development, delivering a production-ready insurance management platform that is secure, performant, and user-friendly, while remaining adaptable for future enhancements and business requirements

