Report of Internship done at Bolt Iot - Inventrom Pvt. Ltd

An Internship Report for

Course code and Course Title: CSA-652 - Industry Internship/ Software Project Development

Credits: 16

Submitted in partial fulfilment of Master's Degree

in Computer Application for Semester VI.

By

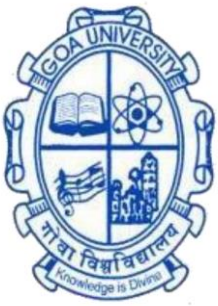
SNEHARSH GURUDAS KERKAR

Roll Number: 2242

Under the Mentorship of

Prof. SWAPNIL FADTE

The Discipline of Computer Science and Technology,
Goa Business School,
Goa University.



Goa University

Date: May 2024

Examined by: Seal of the School

DECLARATION BY STUDENT

I hereby declare that the data presented in this Internship report entitled, "**Report of Internship done at Bolt IoT – Inventrom Pvt Ltd**" is based on the results of investigations carried out by me in the Computer Science and Technology at the Goa Business School, Goa University, under the mentorship of **Prof. Swapnil Fadte** and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the internship report/work. I hereby authorise the University/college authorities to upload this dissertation on the dissertation repository or anywhere else as the UGC regulations demand and make it available to any one as needed.

Mr. Sneharsh Gurudas Kerkar
2242
Master of Computer Application
Goa Business School

Date:

Place: Goa University

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INTERNSHIP OFFER LETTER

INVENTROM

Inventrom/HRD/2023

13th November 2023

To,
Prof. Hanumant Redkar
MCA Placement Coordinator
Computer Science and Technology
Goa Business School
Goa University
Taleigao, Goa

Subject: Offer letter for Web Development Internship at Inventrom - Bolt IoT

Dear Prof. Hanumant,

With reference to the applications and the subsequent discussions we would like to congratulate the following student(s) on being selected for an internship in the Technical team with Inventrom Private Limited (Bolt IoT) based out of Bengaluru. The selected students are:

1. Smita Dike
2. Sneharsh Kerkar

The above students are to report at the Indiranagar, Bengaluru office on 18th December 2023 (Monday). All of us at Inventrom are excited to have them join our team!

Details:

Type	Full-time Internship
Location	Bengaluru
Duration	6 months
Stipend	INR 20,000/- per month
Reporting Manager	Mr. Pranav Kundaikar

Interns **are expected to use their laptops to work.**

The compensation mentioned in this letter comes under the Non-Disclosure Agreement; please do not disclose it.

Each selected student must sign a copy of this letter as a token of acceptance and submit the same for our records.

Sneharsh Kerkar

INTERNSHIP COMPLETION CERTIFICATE

Date: 31st May 2024

INTERNSHIP COMPLETION CERTIFICATE

To Whom-so-ever It May Concern

This is to certify that Mr **Sneharsh Kerkar** has successfully completed an Internship as a **Web Developer Intern** at Inventrom Private Limited (Bolt IoT) for the duration of six months from **18th December 2023 to 31st May 2024** under the guidance of Co-Founder and CTO, Mr Pranav Kundaikar.

During his tenure, he worked on the following tasks/projects:

- Developed a Faculty Dashboard on the Bolt IoT training LMS.
- Created an API Usage Dashboard.
- Redesigned the Bolt IoT Training LMS following the designs provided by the UI/UX designer.
- Built the Course Progress Feature, allowing users to mark topics as completed.
- Implemented a Doubt Resolution Tab.
- Developed a Course Timeline to display different stages of the course training.

We take this opportunity to thank him and wish him all the best in the future.

For Inventrom Private Limited,

Joyner Fernandes
Human Resource Manager

#79, First Floor, 5th main road, 11th cross road, Binnamangala, Stage 1, Indiranagar, Bengaluru -560038
Ph: 8881197198 E-mail: contactus@inventrom.com, Website: www.boltiot.com

COMPLETION CERTIFICATE

This is to certify that the Internship report , "**Report of Internship done at Bolt IoT - Inventrom Pvt. Ltd.**" is a bonafide work carried out by **Mr. Sneharsh Gurudas Kerkar** under my mentorship in partial fulfilment of the requirements for the award of the degree of Master of Computer Application in the Discipline of Computer Science and Technology at the Goa Business School, Goa University.

Prof. Swapnil Fadte
Assistant Professor of Computer Science & Technology
Goa Business School

Date:

Signature of Dean of School/HoD School/Department Stamp
Date:
Place: Goa University

ACKNOWLEDGEMENT

I am privileged to have done my internship in the **Inventrom Pvt Ltd Bolt IoT**. I got a great chance for learning and professional development and growth.

I thank Mrs. **Jyoti Pawar** (Dean, Goa Business School, Goa University), **Mr. Ramdas Karmal**i (Prof. and TPO, MCA, Goa Business School, Goa University), **Mr. Ramrao Wagh** (Program Director, MCA,Goa Business School,GoaUniversity), **Mr.Hanumant Redkar** (Assistant Prof, MCA, Goa Business School, Goa University) , **Mr. Swapnil Fadte** (Assistant Professor of Computer Science & Technology, Goa University)and all the faculty of MCA, Goa University for their constant encouragement and support during the project work.

I would like to thank **Mr.Pranav Pai Vernekar(CEO), Mr.Pranav Kundaikar(CTO)** for giving me an opportunity to intern at **Inventrom Pvt Ltd- Bolt IoT.**

I would like to take this opportunity to acknowledge and extend my sincere gratitude to everyone who has guided and assisted me throughout the course of this Internship Period. First and foremost, I would like to thank my Guide/Mentors **Mr.Pranav Kundaikar(CTO)** , **Mr.Pranav Pai vernekar(CEO), Ms.Joyner Fernandes(HR manager)**, **Mr. Rohit TS (Software Developer)** for guiding me throughout my internship.

I would like to express my special gratitude and thanks to **Inventrom Pvt Ltd- Bolt IoT** employees for giving me such attention and time.

EXECUTIVE SUMMARY

This report outlines my experiences and accomplishments during my internship as a Web Developer at Bolt IoT. Over the course of the internship, I worked with a diverse tech stack, including React.js, Python, Flask, MongoDB, HTML, CSS, and JavaScript. This summary highlights the key aspects of my internship, focusing on the valuable lessons I learned and my overall growth.

- Learnings and Growth: This internship was a profound learning experience that significantly enhanced my technical and professional skills:

- Technical Proficiency: I improved my proficiency in the technologies used, particularly in React.js for frontend development and Flask for backend development. I also gained valuable experience in working with MongoDB for database management.

- Problem-Solving Skills: The challenges I faced helped me develop strong problem-solving skills. I learned to approach issues methodically, leveraging research and debugging techniques effectively.

- Daily Coding Routine: Initially, it was challenging to code every day, but this soon became a habit, boosting my confidence in handling development tasks regularly.

- Collaboration and Mentorship: Working closely with my mentors and team members, I learned the importance of collaboration and seeking guidance when necessary. This helped me overcome obstacles more efficiently and improve my overall work quality.

Conclusion:
My internship at Bolt IoT was a transformative experience that prepared me well for future development roles. The combination of hands-on projects, overcoming challenges, and continuous learning has equipped me with the skills and confidence needed to excel in the field of web development. This journey has not only honed my technical abilities but also instilled a strong foundation for continuous growth and development.

CHAPTER I : ORGANIZATION

1.1 BIRD-EYE-VIEW

Name of the Company: Inventrom Pvt. Ltd.

Address: 79, 11th Cross Road, Binnamangala Indiranagar, Bengaluru, Karnataka, 560038, India.

Phone Number: +91-8881197198

Email: support@boltiot.com

Website: www.boltiot.com

Inventrom Pvt Ltd-Bolt IoT is the creator and manufacturer of the Award Winning Bolt IoT Platform designed for Enterprises and Makers to seamlessly Build and Scale their own IoT products. The Platform is an entire environment of WiFi/Cellular Hardware Module for Sensor/Actuator Integration, A Cloud Dashboard with tools for product development, Data Visualisation, Machine Learning and a Smartphone Application for Remote Operation and Management. Bolt IoT platform gives you the capability to control your devices and collect data from IoT devices safely and securely no matter where you are. Get actionable insights by deploying machine learning algorithms with just a few clicks to detect anomalies as well as predict sensor values.

1.2 PRODUCTS:

Inventrom Pvt Ltd-Bolt IoT products are:

1. **Blake** : An enterprise temperature and humidity monitoring system

2. **Bolt IoT and ML Cloud platform**: A fully integrated IoT platform for developers that helps them to build IoT projects and products quickly and easily.

3. **Bolt Training LMS -** Inventrom Pvt Ltd-Bolt IoT also offer popular training on topics like IoT & ML, Artificial Intelligence, Robotics, Voice Apps, Web Development, Python Programming, Augmented Reality etc for their users to get started with building projects.These courses are available On the Bolt IoT Training LMS which is developed and maintained by Bolt IoT itself.

Bolt has users across 62 different countries with more than 40,000 units of the hardware module shipped

CHAPTER II : TASKS HANDLED

TASKS HANDLED

Roles as an Intern:

- **Code Development:** Develop code adhering to coding guidelines and standards for the respective programming language.
- **Documentation:** Thoroughly document all developed code for clarity and future reference.
- **Testing:** Conduct comprehensive testing of the implemented code to ensure functionality and reliability.
- **Version control:** Regularly push any active code progress to the BitBucket repository, accompanied by creating a pull request upon checklist completion.
- **Code Reviews:** Perform diligent code reviews for assigned pull requests to maintain code quality and integrity.
- **Customer Support:** Offer assistance and support on platforms such as the Bolt Forum and Internshala Forum, as per access privileges.
- **Continuous Learning:** Engage in continuous learning activities, including staying updated on programming languages and emerging technologies relevant to the project.
- **Customer Communication:** Communicate with customers to address major issues, seeking guidance from the manager when necessary.
- **Client Engagement:** Proactively engage with customers and potential clients to identify needs and challenges, and propose solutions utilising the Bolt Cloud Platform.

These are the company Repositories that I worked on:

1. **Bolt Cloud**: This is a flask app which provides users to manage their bolt devices.
2. **Training LMS**: This a Website where the users access and learn their courses. It is mainly based on React js
3. **Metrics App**: This is a flask app for marketing/finance employees of Inventrom Pvt Ltd-Bolt IoT. This is an internal application.
4. **WhatsApp manager**: This is a service to handle WhatsApp related tasks. Remote API app: This is a flask app to handle remote API calls.

PROJECT TASKS HANDLED

During my internship, I worked on several major projects where I made various updates, fixed bugs, and built end-to-end dashboards. The key projects I contributed to include:

1. **Bolt IoT Training Learning Management System:** The Bolt IoT Training LMS is a comprehensive platform where users can access their purchased courses, learn at their own pace, and track their progress. It features an AI code debugger, a lesson plan generator, a faculty dashboard, an AI resume optimizer etc. Additionally, it offers a complete internship management system, supporting students from obtaining offer letters to completing tasks and receiving completion certificates. This LMS provides an end-to-end solution for a seamless and supportive learning experience.

   These are the major features and updated I worked on in this project

   - Faculty Dashboard
   - API usage Dashboard
   - Course Progress Feature – Mark topics as completed
   - Doubt Resolution Tab
   - Course Timeline
   - Redesign of the LMS
   - Improve styling of Admin Edit Trainings page

2. **WhatsApp Chat with us:** This marketing tool is developed specifically for the internal marketing and sales team, enabling them to effectively utilize links in their marketing campaigns. It streamlines campaign management and enhances the team's ability to drive engagement and conversions.

   These are the updates I worked on in this project:

   - Fix Copy button
   - Generated WhatsApp link with customised message.

3. **Metrics App:** This internal app is designed for employees to support marketing and technical purposes. The app also provides comprehensive details about users and their products, streamlining employee access to crucial data for enhanced operational efficiency.These are the updates I worked on this project:

   - Implementing Admin Dashboard inside Metrics app

2.1 FACULTY DASHBOARD in Training LMS

Overview:

Develop a comprehensive dashboard for faculty and college professors to efficiently manage students enrolled in Bolt IoT trainings and monitor their progress. Designed for both web and mobile views, this dashboard will enhance the ability to oversee student performance, streamline administrative tasks, and provide valuable insights into student engagement and achievements.

The development of this dashboard is completed and it is live.

URL: faculty.boltiot.com

Key Features

1. Student Progress Monitor

Student List: Professors can view a list of their students, displaying basic details including name, college, roll number, training name, and course completion percentage.

Detailed Information: Access comprehensive student profiles with essential information.

2. AI Lesson Plan Generator

AI-Powered Tool: An AI tool for teachers to generate lecture plans, making lesson planning efficient and tailored to the curriculum.

3. Support & Escalation Tab

Support Query Management: Provides details on how to raise a query for support and manage escalations effectively.

Additional Functionalities

- Customized Greeting Message

Personalized Experience: A customized greeting message with the professor's name and salutation for a personalized user experience.

- Faculty Verification

Secure Access: Only verified faculty members can access the dashboard, ensuring security and authenticity.

- Training and Internship Completion Status

Progress Tracking: View the completion status of trainings and internships for better oversight and management.

Student Details without Account

Comprehensive Records: Show student details even if they haven't created an account on the website but have purchased the training.

Technologies used: React.js, Python, Flask, CSS

Tasks I have completed in the development of this dashboard:

- Developed the entire dashboard end-to-end, covering frontend, backend, and database integration.
- Designed and implemented the user interface for all pages using React components.
- Created mock data to display on the frontend for development and testing purposes.
- Implemented functions to fetch data from the backend using useEffect hooks in React.
- Developed backend routes to handle necessary functionalities and data retrieval.

Coded and optimized database functions to support the application's data requirements.

2.2 API USAGE DASHBOARD

The API Usage Dashboard was developed to address the challenge of OpenAI discontinuing API key credits, which affected students in the Bolt IoT Artificial Intelligence course. To resolve this, Bolt IoT created the "boltiotai" Python library, allowing students to generate API keys and access OpenAI credits provided by Bolt IoT. The dashboard enables students to easily generate, copy, and use their API keys in projects, track credit usage, and follow instructions for effective use. This solution ensures uninterrupted progress in their AI projects.

In this project, I focused on developing the frontend . Taks included:

- Developed the end to end Frontend System
- Developed the User Interface
- Dynamically getting data,from backend and populating the frontend
- Handeling API calls etc
- Fixing bugs

Technologies used: React js, python Flask

URL: trainings.boltiot.com/ApiUsage

2.3 COURSE PROGRESS FEATURE – Mark topics as Completed

A feature that marks topics as completed with a tick icon when the complete button is clicked. It also calculates and displays the course progress percentage.

Tasks Handled.

- Developed the Frontend User Interface
- Worked on developing multiple functions, useeffects to handle the topics completed and calculate the percentage
- Integrate this information in the backend

Technologies used:
React.js, python, Flask

2.4 REDESIGNED BOLT IOT -LEARNING MANAGEMENT SYSTEM

Changed the look and feel of the LMS using the designs given by UI/UX designer. This update is not live yet and is live in production

Tasks handled.

- Redesigned all the screens on the training LMS as designs provided by UI/UX designer
- Collaborated with mentor and guide to seek any reviews or opinions
- Mobile Optimized the design
- Fixed bugs after deployment.

Technologies used: React.js, HTML, CSS, Javascript

CHAPTER III : LEARNINGS

Learnings from the Internship
During my internship, I had the incredible opportunity to delve deeply into the real-world practices of software development within a company setting. This experience was transformative, as I learned not just about the technical aspects, but also about teamwork, time management, and professional growth.

Frontend Development with React.js
One of the key areas I focused on was frontend development, specifically using React.js. I gained extensive knowledge on how to build aesthetically pleasing and highly functional user interfaces. React.js, with its component-based architecture, allowed me to create reusable UI components, making the development process more efficient and the application more maintainable. I learned how to manage state effectively, pass data between components, and handle user interactions seamlessly. Working with props and state management gave me a solid foundation in developing dynamic and responsive web applications.

Backend Development with Python Flask
On the backend, I had the chance to work with Python Flask, which provided invaluable insights into server-side development. I learned how to set up and manage servers, handle requests and responses, and interact with databases. This experience honed my skills in building robust and scalable backend systems, ensuring that the frontend could communicate efficiently with the server to fetch and store data.

Collaboration and Teamwork
Working on projects with my team was one of the most enriching aspects of the internship. I learned the importance of effective communication, collaboration, and the ability to work cohesively in a team environment. We used tools like Git for version control, which was essential for managing our codebase and collaborating on different features simultaneously. This experience taught me how to resolve conflicts, conduct code reviews, and ensure that our code was clean and maintainable.

Time Management and Meeting Deadlines
Time management was another crucial skill I developed during this internship. Balancing multiple tasks and projects required careful planning and prioritization. I learned how to set realistic goals, break down tasks into manageable chunks, and adhere to project timelines. This was particularly important when facing tight deadlines, where working efficiently and sometimes putting in extra hours was necessary to ensure project completion.

Database Management with MongoDB
I also had the opportunity to work with MongoDB, a NoSQL database, which provided a new perspective on data management. Learning how to design and manage databases, query data efficiently, and ensure data integrity was an essential part of my backend development experience. This knowledge was crucial for developing applications that could handle large volumes of data and provide fast, reliable access to users.

Overall Experience

Overall, this internship was a comprehensive learning journey that equipped me with a robust set of skills and knowledge. I entered the internship with limited experience in development, but through hands-on projects and continuous learning, I now feel confident in my abilities to take on more complex assignments. The experience has also taught me the importance of continuous learning and adapting to new technologies and methodologies.

This internship not only enhanced my technical skills but also prepared me for the collaborative and dynamic nature of the software development industry. I am excited to continue building on this foundation and applying what I have learned to future projects and career opportunities.

CHAPTER IV : CHALLENGES

Challenges Faced During the Internship

During my internship, I encountered several challenges that significantly contributed to my professional growth. These experiences pushed me to refine my skills, enhance my problem-solving capabilities, and become a more resilient developer.

Adapting to Daily Coding

Initially, I struggled to adapt to daily coding, as I wasn't used to such a routine. However, with time and persistence, coding became a natural part of my day, boosting my confidence in handling development tasks consistently.

Backend Development and API Integration

Creating API routes and retrieving data presented major challenges in backend development. I faced difficulties in designing efficient endpoints and ensuring data integrity. Through persistent debugging, research, and learning from online resources, I eventually overcame these hurdles and gained a deeper understanding of backend systems.

Debugging

CSS styling, though seemingly straightforward, sometimes led to stubborn bugs that disrupted web page layouts. With meticulous attention to detail and guidance from my mentor, I learned effective troubleshooting techniques to resolve these issues.

Development Difficulties

Mastering state management in React.js and integrating third-party libraries posed significant challenges. Extensive documentation reading, experimentation, and advice from experienced developers helped me overcome these difficulties and improve my development skills.

Time Management and Task Prioritization

Balancing multiple projects and meeting tight deadlines required effective time management. Prioritizing tasks, setting realistic goals, and occasionally working overtime taught me dedication and perseverance in a professional setting.

Working with Databases

Managing databases, particularly with MongoDB, involved designing efficient schemas, ensuring data integrity, and optimizing query performance. By studying best practices and refining my approach, I improved the performance and reliability of database interactions.

Overall Impact

These challenges were instrumental in my development as a programmer. They pushed me to continuously upgrade my skills and enhance my capabilities. Each obstacle I encountered and overcame contributed to my growth, making me more resilient and adept at problem-solving. I am grateful for these experiences, as they have made me a more competent and confident developer, ready to take on future challenges.

CHAPTER VI : REFERENCES

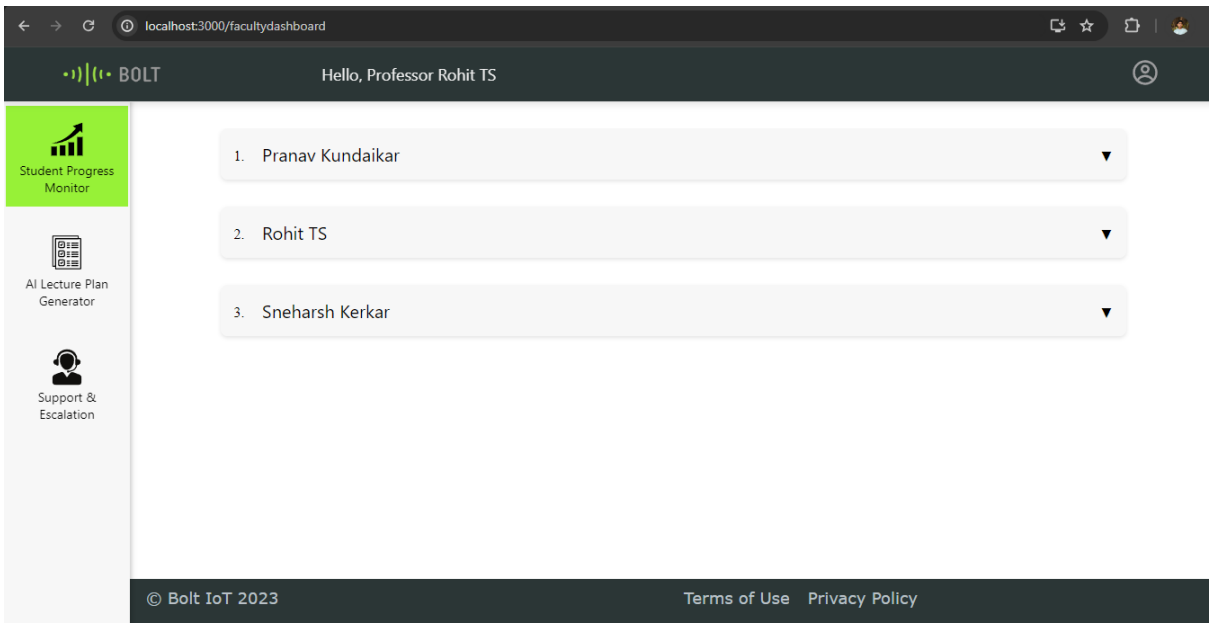
- https://slack.com
- https://www.boltiot.com/
- https://bitbucket.org/
- https://react.dev/learn
- https://www.python.org/
- https://www.postman.com/
- https://www.mongodb.com/
- https://www.mysql.com/
- https://git-scm.com/

APPENDIX I

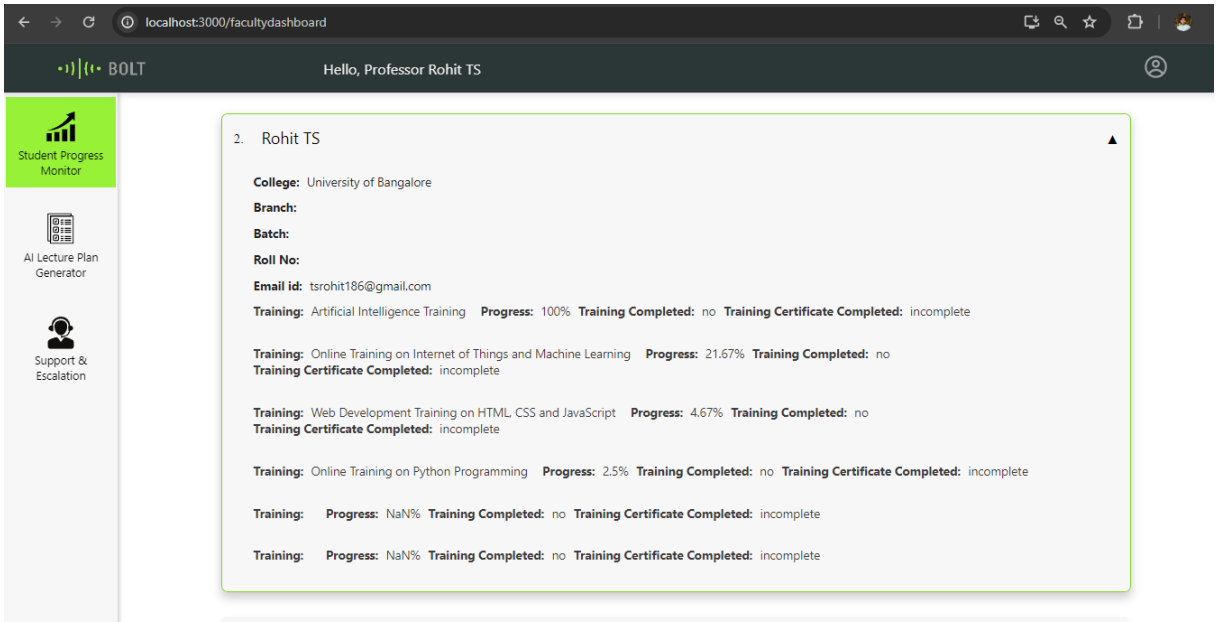
Sample of work done

Screenshots – Faculty Dashboard

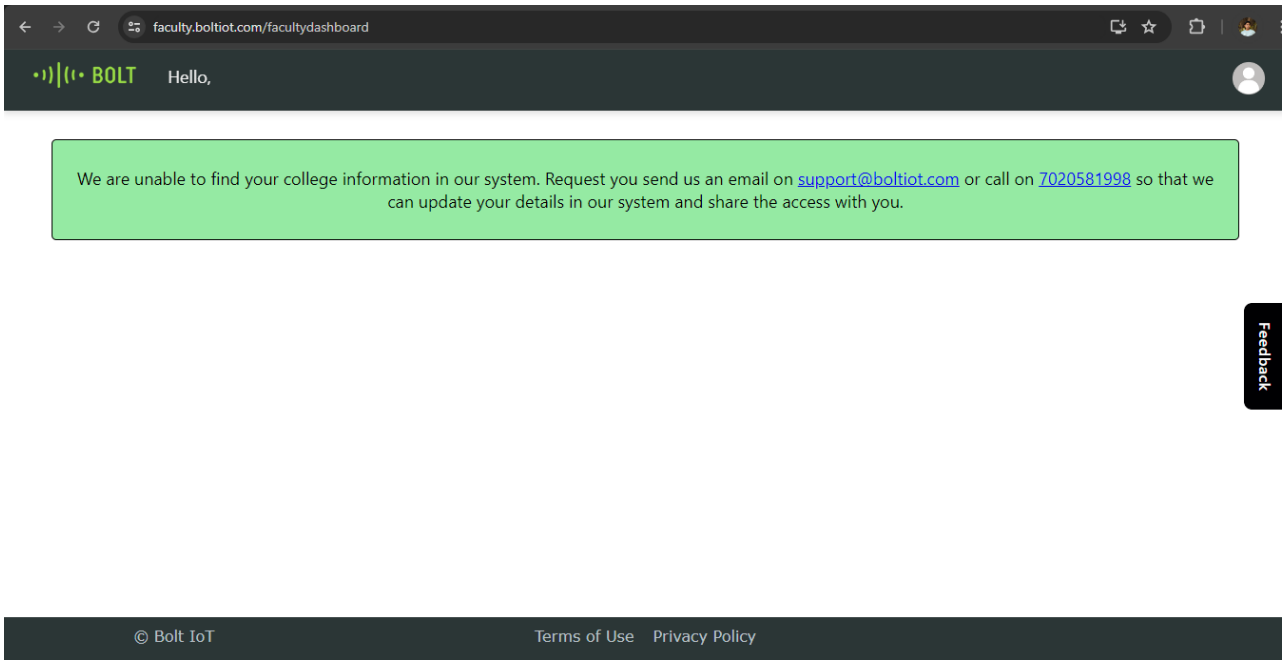
Student progress monitor – cards closed with list of students



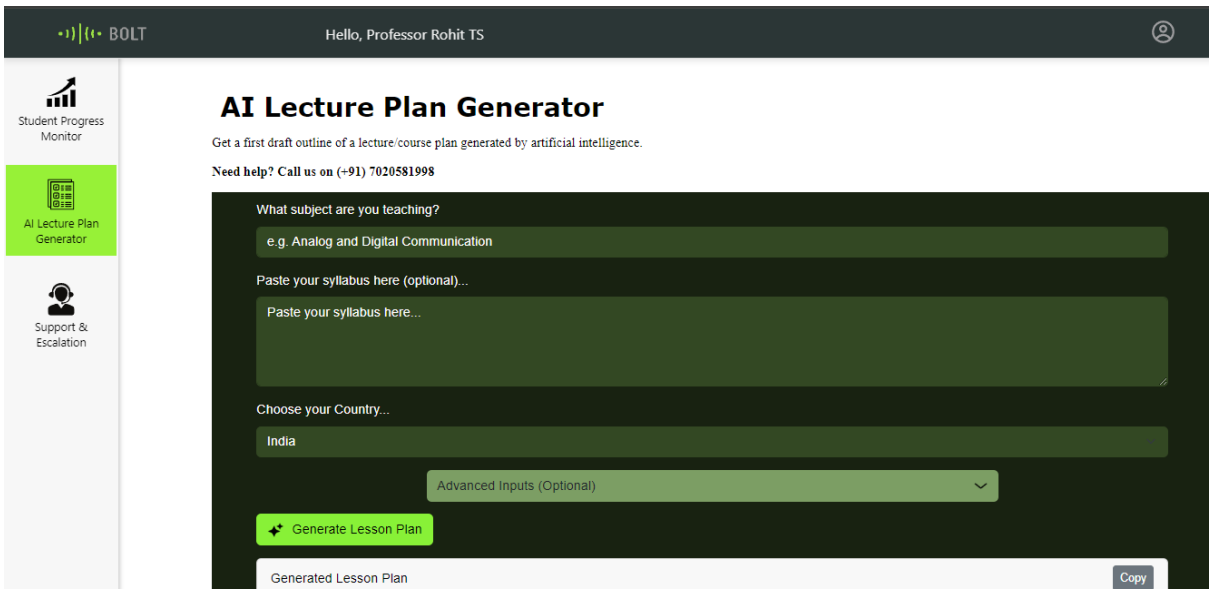
Student progress monitor – cards expanded with details



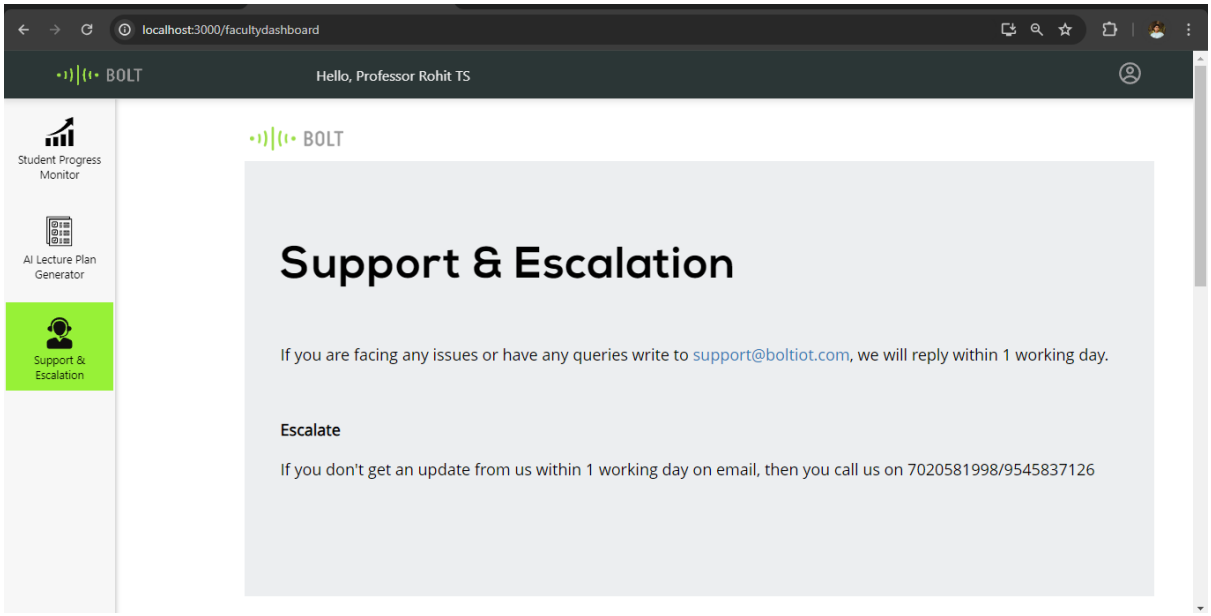
Faculty not verified screen



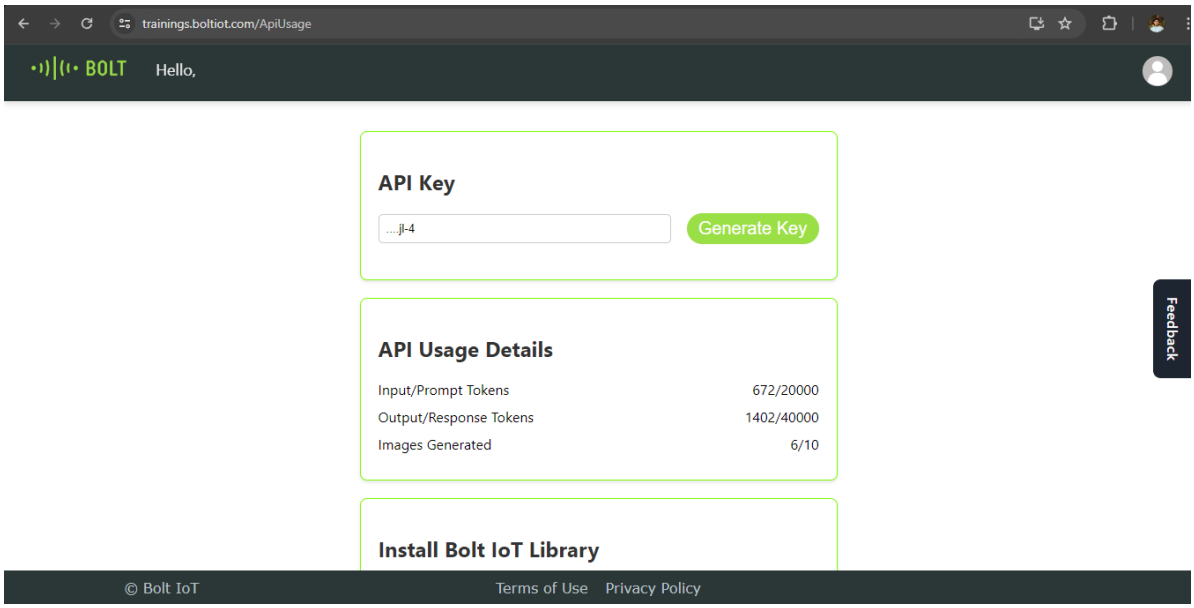
AI Lecture plan Generator



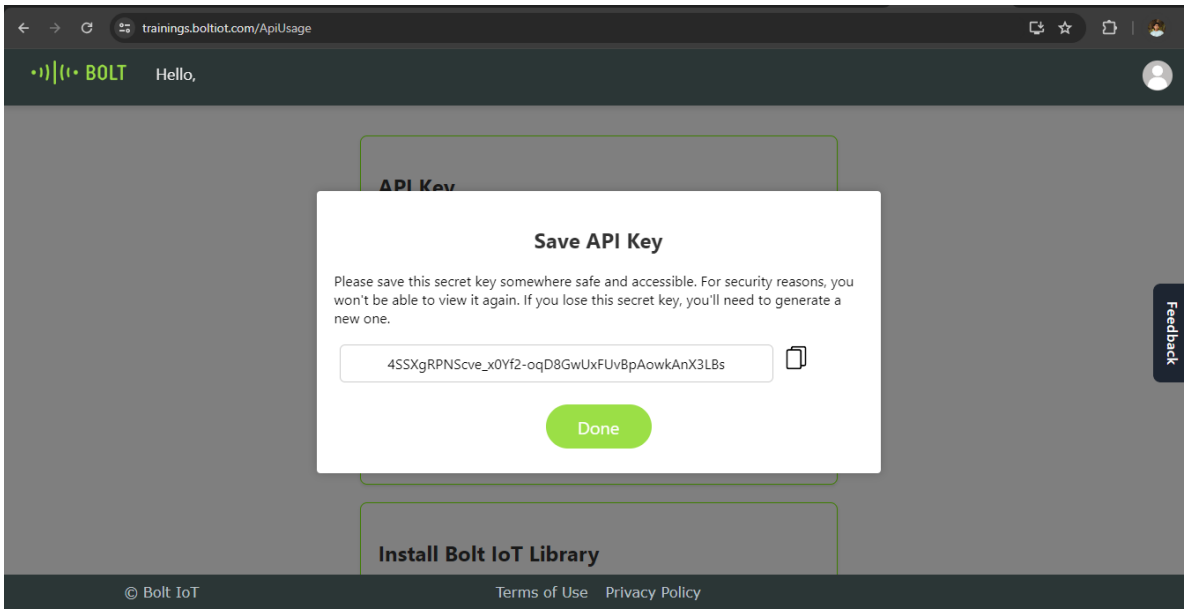
Support and Escalation Tab



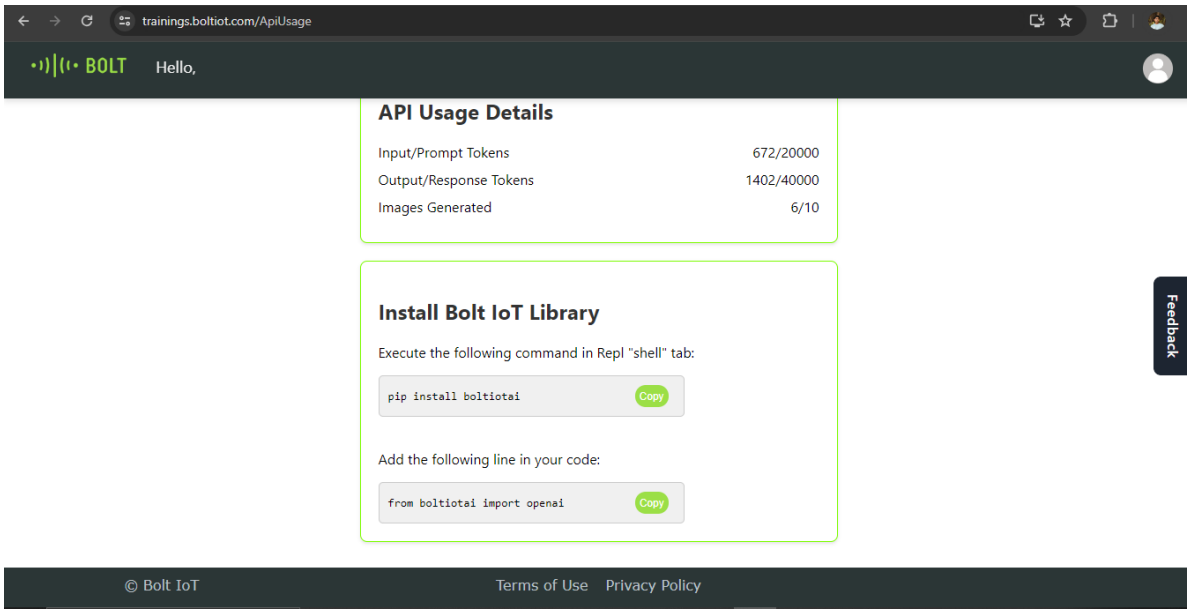
API Usage dashboard main screen



Generate API key Modal screen. Once generated you can copy it.

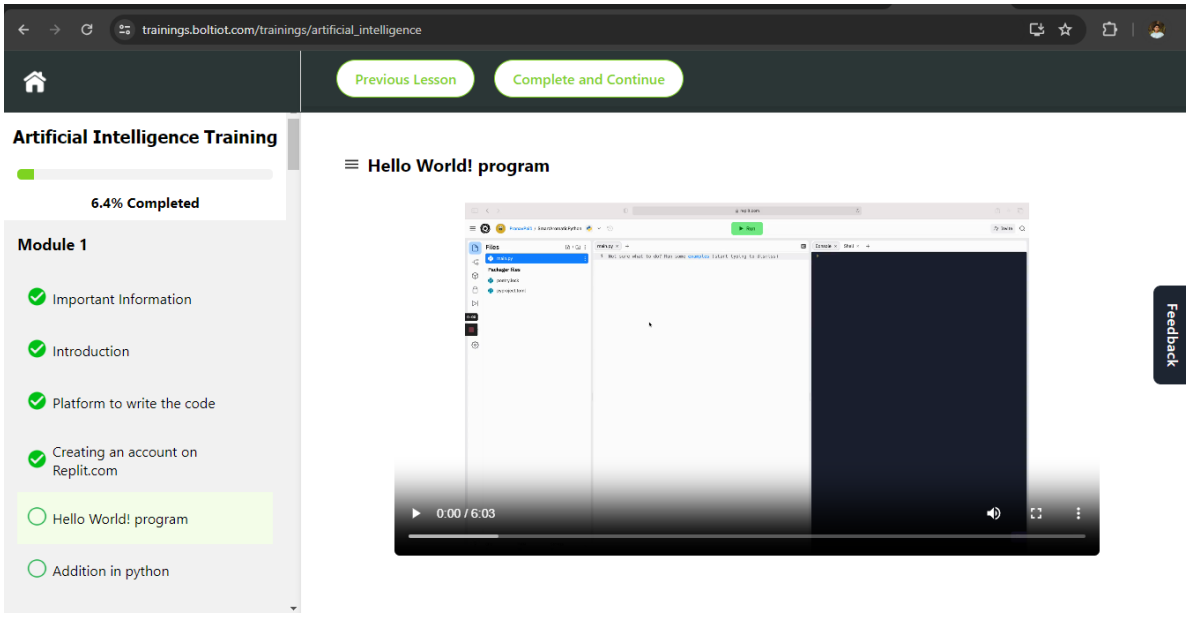


Library installation instructions:



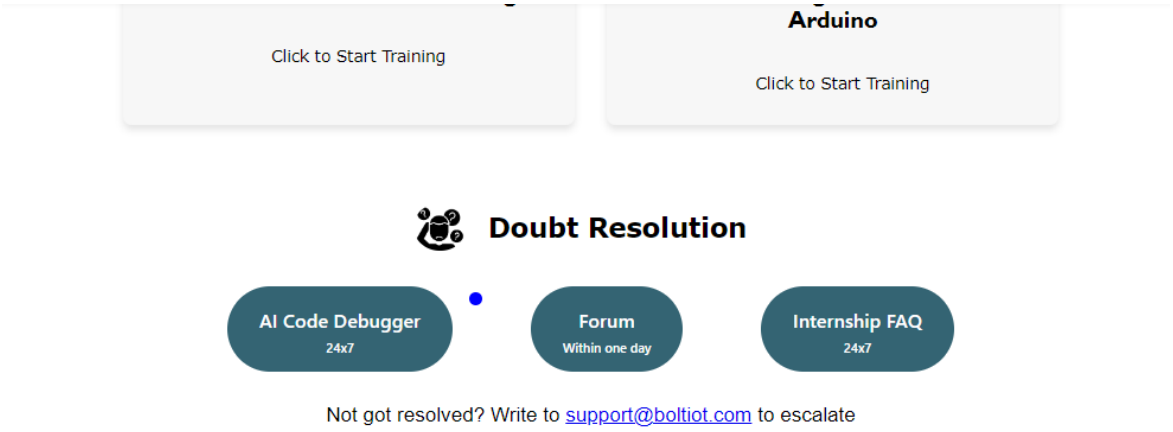
COURSE PROGRESS FEATURE – Mark topics as Completed

A feature that marks topics as completed with a tick icon when the complete button is clicked. It also calculates and displays the course progress percentage.



DOUBT RESOLTION TAB

A dedicated tab designed to address your queries. It features three buttons that lead to an AI code debugger, the Forum, and Internship FAQs.

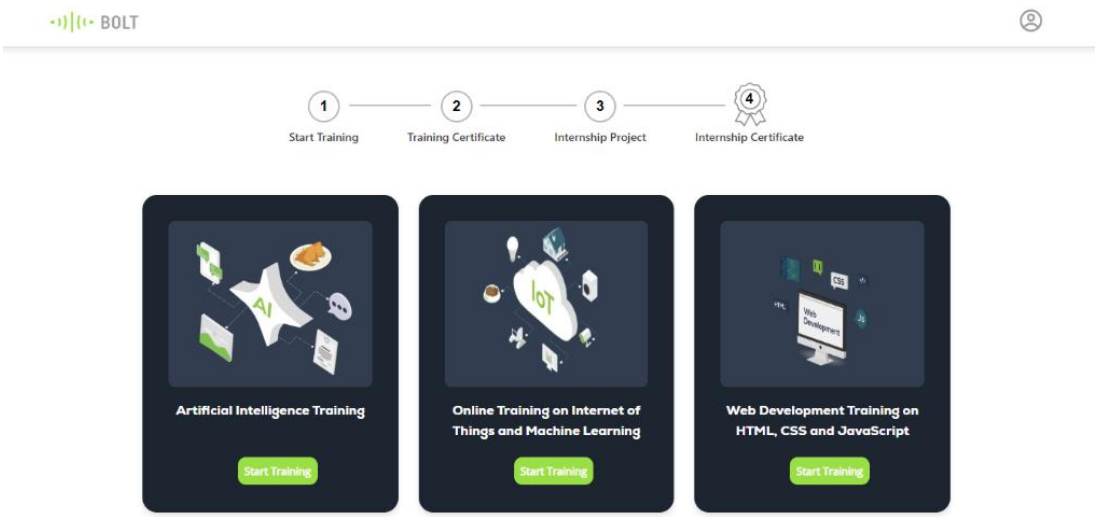


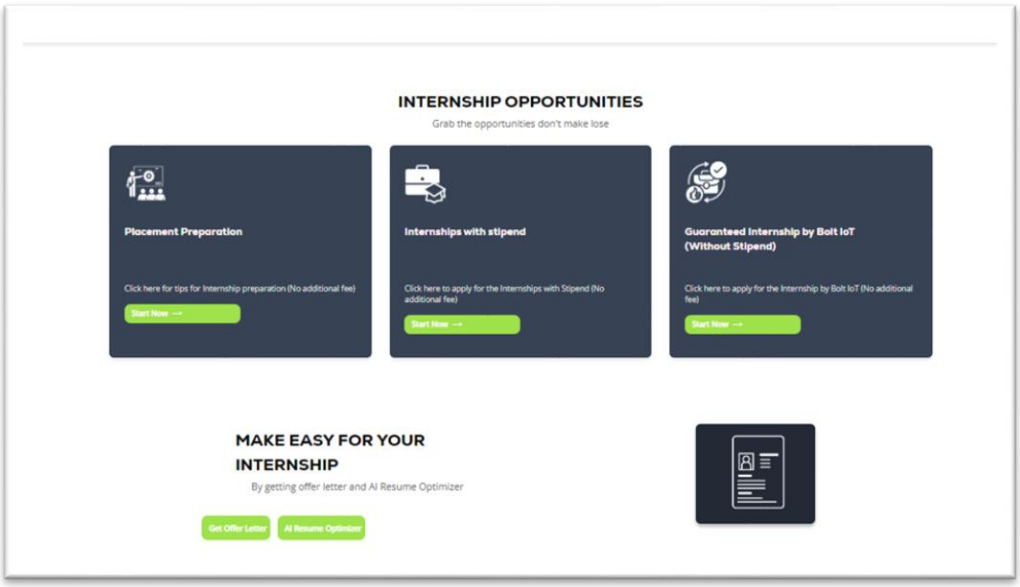
COURSE TIMELINE

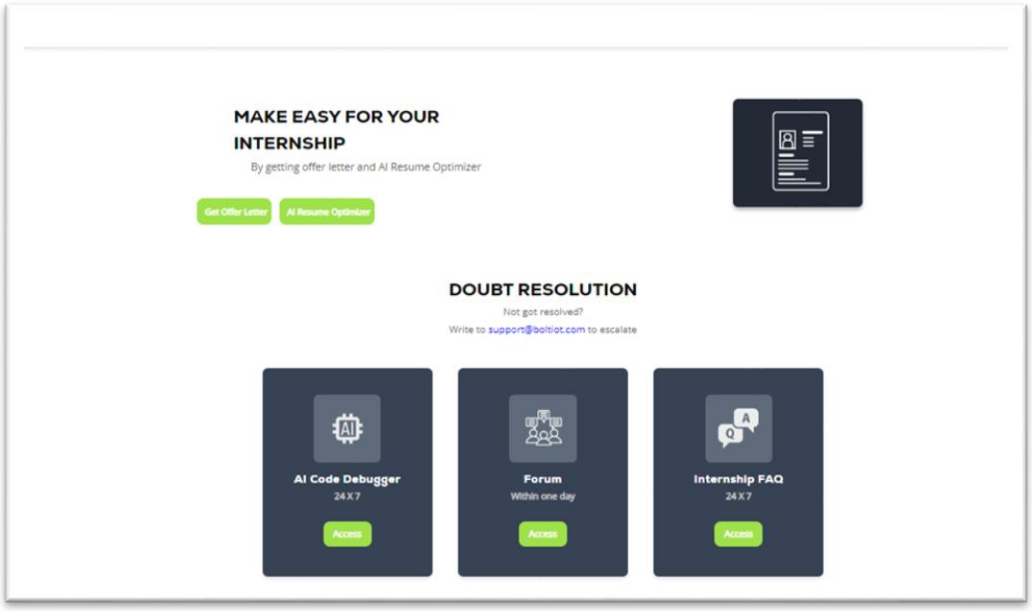
A timeline that briefly outlines the key stages of the course, highlighting what you will receive at each stage.

REDESIGNED THE LMS

Changed the look and feel of the LMS using the designs given by UI/UX designer. This update is not live yet and is still in development phase.

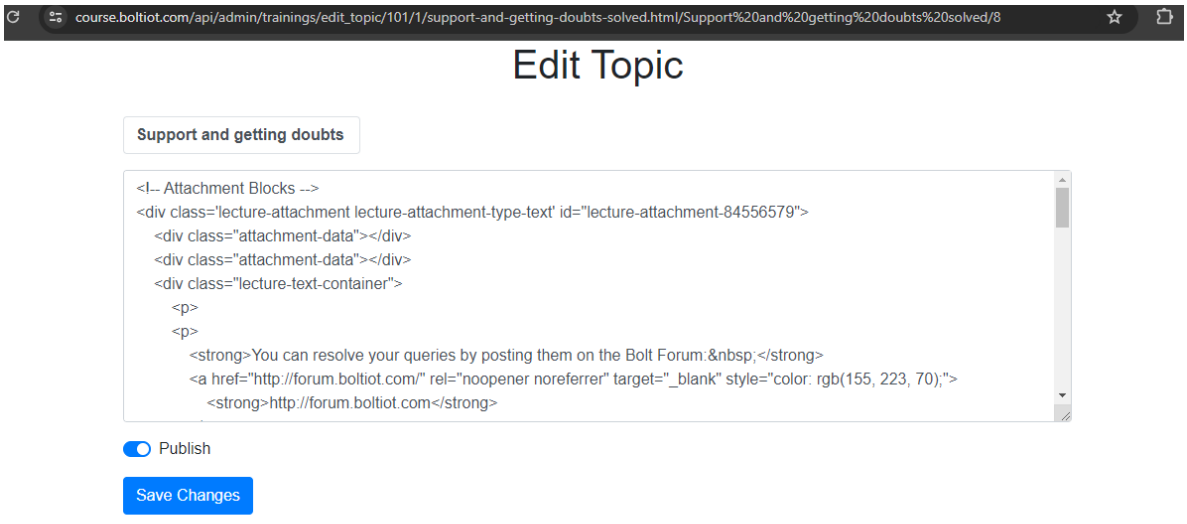






IMPROVED STYLING OF CODE EDITOR ON ADMIN SIDE

Added bootstrap for styling this page.



APPENDIX II

Photos while at work

Faculty Dashboard Feature Launch