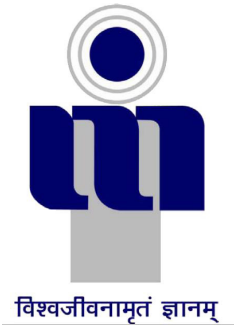
Enhancement of Scaler Platform to provide a structured, flexible and guided learning program

A project report submitted in partial fulfillment of the requirements for summer internship

by

Sanjit Prasad (2016IPG-91)



ABV INDIAN INSTITUTE OF INFORMATION TECHNOLOGY AND MANAGEMENT

GWALIOR-474 015

2020

InterviewBit Technologies Private Limited
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CIN U80902PN2019PTC183880

INTERNSHIP LETTER

Date: 14th August 2020

This is to certify that Sanjit Prasad has worked as a Software Engineering Intern in our company from 11th-May-2020 to 31st-July-2020.

Please find his internship details below:

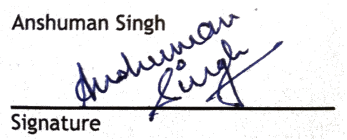
Location: Bengaluru
Department: Technology
Designation: Software Engineering Intern

During his working period, we found him to be a sincere, dedicated intern with a professional attitude and very good job knowledge.

We thank him for all the efforts and contribution and wish him all the best in his future endeavours.

Yours Sincerely

Anshuman Singh

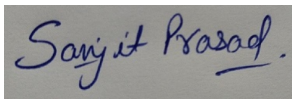


Signature

Director, InterviewBit Technologies Private Limited

CANDIDATES DECLARATION

I hereby certify that the work, which is being presented in the report, entitled **Enhancement of Scaler Platform to provide a structured, flexible and guided learning program**, in partial fulfillment of the requirement for the award of the Degree of **Master of Technology** and submitted to the institution is an authentic record of our own work carried out during the period *May 2020* to *July 2020* in internship at **Scaler Academy - InterviewBit Technologies Private Limited**. I also cited the reference about the text(s)/figure(s)/table(s) from where they have been taken.



Date: 16th Oct 2020 Signature of Candidate

ABSTRACT

InterviewBit is one of the most popular among the top 10 startups in India 2020, is an interview preparation website. It gives an organized, adaptable, and guided learning program for tech experts to accelerate their profession. Countless world-class programming engineers far and wide have joined the stage to upskill themselves. They likewise source pre-screened contender to various organizations and new companies far and wide. InterviewBit was established by ex-Facebook and Fab.com chiefs Anshuman Singh and Abhimanyu Saxena.

They have constructed adaptable and versatile frameworks and understand the genuine significance of DSA and System Design, in interviews as well as all through your vocation. They have made customized programs for the two tenderfoots to specialists which help them to learn new tech aptitudes to scale your profession to the following level. The educational plan is intended to make you a strong designer dependent on you to enter beginner/intermediate/advanced segments. Novice and Intermediate areas spread some extra fundamental subjects that best in class which is not needed for advanced students.

The Scaler tried and tested educational program, by a huge number of understudies to change their profession incorporates, Learn in live gamified study halls Structured, adaptable educational program 1:1 coaching and fast uncertainty tackling, Collaborate with a worldwide network, Develop certifiable tasks.

Keywords: Algorithms, Class sessions, Data structure, Interviews, Problem solving, Scaler

ACKNOWLEDGEMENTS

I am greatly obliged to the director and faculties of our institute, to give me the opportunity to pursue my internship without any obstacles from academics. Their constant support and guidance have helped to perform in this work. I am also very thankful to Mr. Anshuman Singh (Co-Founder at Scaler Academy & InterviewBit) for having trust in me and also giving me the opportunity to work with them. I am immensely indebted to my mentor, Mr. Shivang Nagaria (Software Engineer at Scaler & InterviewBit) for his constant support and guidance. I plunge into this opportunity of expressing gratitude towards him whose doors were always open for helping me in times of technical distress. Despite his busy schedule he was available to solve my query and also enthrall confidence in me.

Last but not the least I would like to thank my parents for their constant support and guidance. I believe this would not have been possible without their trust on me.

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ABBREVIATIONS

AWS	Amazon Web Services
COC	Convection Over Configuration
DOM	Document Object Model
DRY	Don't Repeat Yourself
IB	Interviewbit Academy
IBM	International Business Machines
J2EE	Java 2 Platform, Enterprise Edition
JS	Java Script
NET	NET Framework
OS	Operating System
ROR	Ruby on Rails
UI	User Interface
WA	Web Applications

CHAPTER 1

INTRODUCTION AND LITERATURE SURVEY

This chapter includes the details of the company profile, problem statement and objective of the work, platform used to implement the task and literature's review related to work done in this field.

1.1 COMPANY PROFILE

In this section we briefly describe about the history and background of company profile and their mission and vision towards the future.

1.1.1 Background

Scaler Academy previously known as Interviewbit Academy is one of the most popular interview preparation websites, among the top 10 startups in India founded by Fab.com and ex-Facebook executives Anshuman Singh and Abhimanyu Saxena in 2015. It is a privately held E-learning platform that empower and accelerate the tech career of pre-screened candidates to different startups and big tech companies around the world. They are committed to incorporating new technologies, goods, and programs that can enhance the software engineer's well-being and provide them a suitable resource to upskill themselves. InterviewBit is one of the most popular interview preparation websites for coding interviews targeting college students, experienced professionals, and tech leaders.

1.1.2 History

The co-founders Anshuman Singh and Abhimanyu Saxena mainly focus on the problems being faced by the students during their curriculum, where they fail to crack the

interviews of big-tech companies. Hence the idea of Interviewbit Academy was born and now it is among the top 10 startups in India in 2020. This company started with very few but dedicated and hardworking employees whose passion for revolutionizing the world leads to the success of this company.

1.1.3 Mission and Vision

They aim to increase knowledge and promote the coding culture among the high-school and college students which helps them to get into their dream companies. To provide high-quality resources, they hire the best of the best tech leaders and teachers which motivates and teaches students about the advancement and understanding of software development. They respect the student's relationship and encourage individuals to make decisions with the knowledge, advice, and resources they need.

CHAPTER 2

PROBLEM STATEMENT AND OBJECTIVE

2.1 Problem Statement

Enhancing the user experience on the Scaler platform by adding more features and functionalities. Boost and improve the performance of the Scaler platform by automated content caching at the user level. Building features such as automated reward system, global leaderboard from Redis cache, toggle problem tags, session reminder notifications, renew user subscription interface, etc. Develop a shareable user profile page which includes features such as overall performance, achievement, badges earned, and topic wise problem stats. Rebuilt the global leaderboard for all contests and create a global-leaderboard card that displays badges earned and maximum coding streak. Deploy the working model sufficing these tasks on production using tech stacks such as RubyonRails, React.js, and Redux.

2.2 Objective

(a) To enhance the user experience on Scaler platform and build features according to company requirements.

(b) To automate reward mailer system for continuous streak of 30, 45 and 60 days and flexible for adding more days.

(c) To build global leaderboard system for all type contest.

(d) To build user profile page representing the overall performance during the course curriculum.

(e) To build automated user interface for session reminder notifications and renew user subscription.

(f) To deploy the entire working model on production using Ubuntu Linux OS, Ruby-onRails, React and Redux tech stacks.

CHAPTER 3

LITERATURE REVIEW

Ruby on Rails (RoR) has quickly grown since the arrival of version 1.0. Ruby on Rails is designed to make programming and developing web applications more convenient by making premises about what all developer necessitates to get excited. Skilled Rails developers also state that it executes web application development more fun. With the popularization of RoR, increasingly more advancement apparatuses supporting RoR rose. In this paper [1], authors think about and dissect a few principles RoR improvement instruments dependent on our experience of utilizing those apparatuses, which can help RoR engineers select the most reasonable devices as per their specialized foundation and programming inclination. The Rails belief incorporates two major guiding policies which include, Don't Repeat Yourself (DRY) and Convention Over Configuration (COC).

In this paper [5], authors have suggested an investigation of the evolution and variances in the 'Ubuntu Linux' Operating System (OS). Ubuntu is an Open Source operating system which aims to provide modifiable OS according to the end-users need. They have conducted quantitative analysis on various distributions of Ubuntu to explore its unpredictability and improvement for the duration of the time. Numerous developers around the world contribute to the advancement of the Linux operating by contributing new features and reporting bugs in the existing resources. The community always provides an update by fixing bugs and adding new features at the earliest.

With Web administrations anticipated to become devoted processing, engineering is not so far-off future. The practicality of the Web applications (WAs) will rank high on determination models while selecting a stage for the progression of a WA. In this paper [4], the authors assess the practicality of little scope WAs based on .NET, J2EE, and Ruby On Rails (RoR). Web Applications (WAs) are developing remarkable ubiquity because of their reconciliation into plans of operation. The practicality rules are considered incorporated modifiability, understandability, testability, and transportability. They found that the RoR execution is far better on understandability, modifiability, and testability while the J2EE was the most suitable. Driving stages for WA advancements are .NET, and J2EE as of late, Ruby On Rails (RoR) has additionally gotten the consideration of the business.

Nowadays React is the best mainstream web system that has plucked up significance over several frameworks, for example, Angular, Vue, etc. This is a result of its performance of Virtual DOM, whose fundamental goal is to improve the overall performance of the application. The paper [3] depicts a period of productive hunt consideration that can be used for scanning through articles in a large informational gathering. React helps to make creative and complex interactive user interfaces components that manage their states. It also helps to maintain each state in your application, and will efficiently modernize and render just the finished components meanwhile your information changes. As components are logically written using preferably JavaScript, we can easily transfer rich data into your app and keep the state out of the Document Object Model (DOM).

With the improvement in market interest for systems defined by low-latency and the importance of the use of commodity hardware and software, in [2] author describes a real-time enterprise operating system. In response to the requirement for accelerated access, the Java and IBM Linux Technology collaborated to provide the first open-source real-time Linux kernel accomodating Java assistance. The open-source operating systems contribute to the developers a huge advantage in the development and the progression of building new technologies in the fast advancing world. The IBM Linux Technology is the first open-source real-time Java assistance supported kernel that introduced the world to real-time development. The support for a commodity such as hardware and software using this IBM kernel is enormous and vast, hence can be used for performing any task in the future.

CHAPTER 4

SOLUTION APPROACH

My task was to build and develop various features and functionalities. And to enhance the performance of some existing work done on ROR models. With the following Figure 4.1, explains the basic flow of my work which I performed in that given tasks.

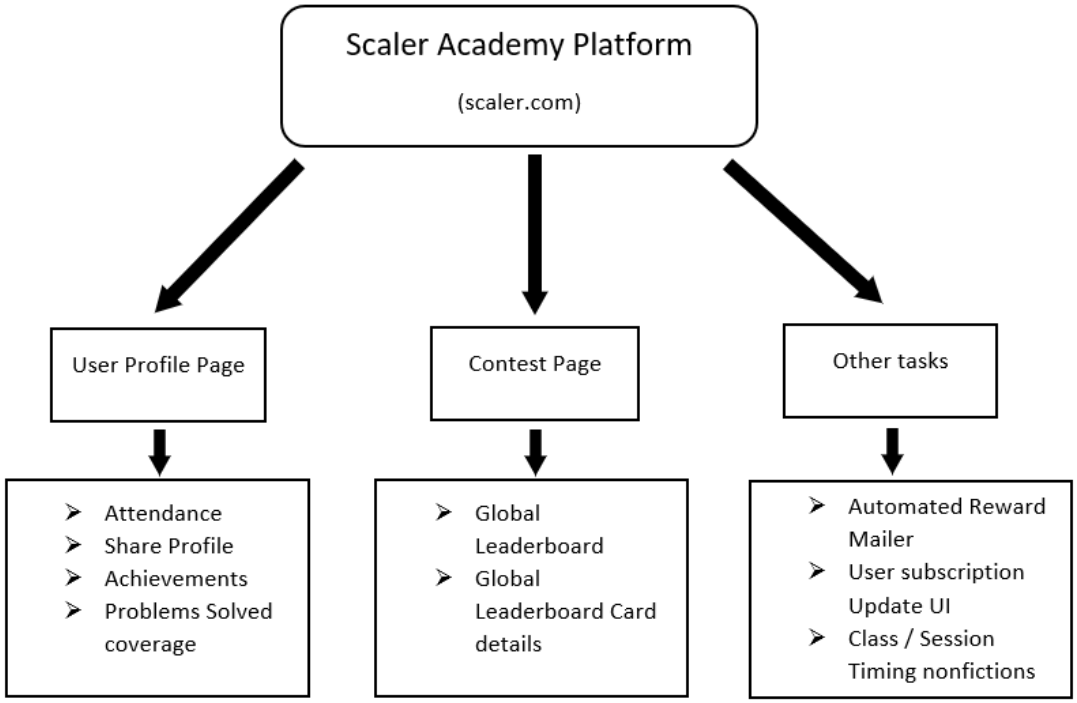

Figure 4.1: Represents flow chart of work done

4.1 METHOD AND MATERIALS

4.1.1 Methods

4.1.1.1 Academy Profile Stats

After getting a lot of feedback about the user profile page from mentees where they can showcase their progress during the course curriculum and achievements and rewards earned during the contests, we develop a user profile page from scratch where every user can see their own and other's progress report, including overall performance, topic wise problem stats and achievements during the entire course curriculum.
We created the user profile page for both desktop version and mobile version of them with some additional features such contest ranks, badges earned third party profiles and sharing the profile on other platforms.

4.1.1.2 Automated Streak Reward Mailer

There is no reward system for mentees for completion of long streak days. Thus it leads to creating a situation where user devises any time when they are not interested in up solving any problems. Thus, we need to develop a one-time reward system for mentees for completing each of continuous 45, 60, and 90 days coding streak. For streak 45 continuous days, a 1:1 session with top tech career coaches is provided. For completing a streak of 60, an interview session is rewarded by Scaler team member.
A Cron job runs daily around 8 pm, which increases the streak days count by one if a user is successfully able to achieve the daily goal. Also, in case a user can not achieve the daily goal score points, then the streak days would be diminished to half.

4.1.1.3 Classroom Rank And Missed contests

If a mentee was unable to participate in a contest, then it shows as "absent" which is obscure. This looks the same as not attending the class. Hence, we need to show something which shows a meaningful message. Also, there were no trophy prizes for the top 3 performers in any contest. Hence, we need to add a trophy as a reward for the top 3 performers in the contests.
Hence, we re-build the whole model according to the requirements. If some user did not participate in the contest, it shows as "missed" which is quite meaningful and we have also added trophy for top 3 performers for a contest they participated in.

4.1.1.4 Scaler Academy Class Notification

There is a requirement of sending an update about the timings of re-scheduling of academy class/sessions. We did not have any method to automatically notify students about the re-scheduling of class/session timings. Hence, we need to develop an automated message portal where a mentor can choose between sending a message or not notify the students respective for that class/session. There should be a prompt to send message options available for the mentors, where they can decide whether they wanted to send the notification message or not.

4.1.1.5 Global Leaderboard For All Contests

Initially, mentees did not have any option to view the contest leaderboard for past contests. They can be only able to see the current ongoing session leaderboard. Hence, we need to develop a Global Leaderboard page from scratch where a user can access any contest leaderboard details based on the date. The problem that the contest data were stores in the Redis cache and we have no method to store it in the cloud-based system. Hence, we need an efficient solution which can show the contest result Global Leaderboard for any contests. The contest data were initially present in Redis-cache and fetched from there. We need to build a state-based Global Leaderboard which automatically updates the data to cloud storage (AWS) at the end of the contest.

4.1.1.6 Toggle Topic View

The coding problems topic tags were shown by default as a mentees move to the problem section. This creates a suggestion for the approach for the problem to be taken while solving the problem, which is not what they wanted. Hence this creates a hint for the approach for solving the problems which create a kind of cheating strategy.
We need to add a toggle button for which can turn between show and hide the problem topic tags in the navigation bar. This button is set to be hiding the problem topic tags at the beginning unless the mentee wants to see the actual algorithm used to solve the problem.

4.1.1.7 User Subscription Date Change UI

We did not have any user interface UI for updating the contract end date of a user's subscription. Hence, every time the mentors need to access the database and update the dates accordingly from there, which is a lot of manual tasks to be done.
Hence, we need to develop a UI based contract end date updating from an admin panel where the admin can select any date from the calendar, and the chosen date will be updated automatically via a SQL query into the database.

4.1.2 Materials Used

4.1.2.1 Tools

- Mailcatcher, Webpack
- Google Chrome, Developer tools
- Github and Git client, Rails console

4.1.2.2 Languages

- RubyonRails v5.4
- HTML, CSS, SaaS
- React, Redux, JavaScript

4.1.2.3 Technology

- Ubuntu OS v20.04.1 LTS (Focal Fossa)
- DBeaver v7.2 SQL client software for database
- Slack v4.7.0 for collaborative environment

CHAPTER 5

RESULTS AND INFERENCES

5.1 RESULTS

5.1.1 Academy Profile Stats

We develop a user profile page where every user can see their own and other's progress report, including overall performance, topic wise problem stats and achievements during the entire course curriculum. In Figure 5.1, a desktop version and in Figure 5.2, a mobile version of the user profile page is shown with some additional features such contest ranks, badges earned, third party profiles and sharing the profile on other platforms.

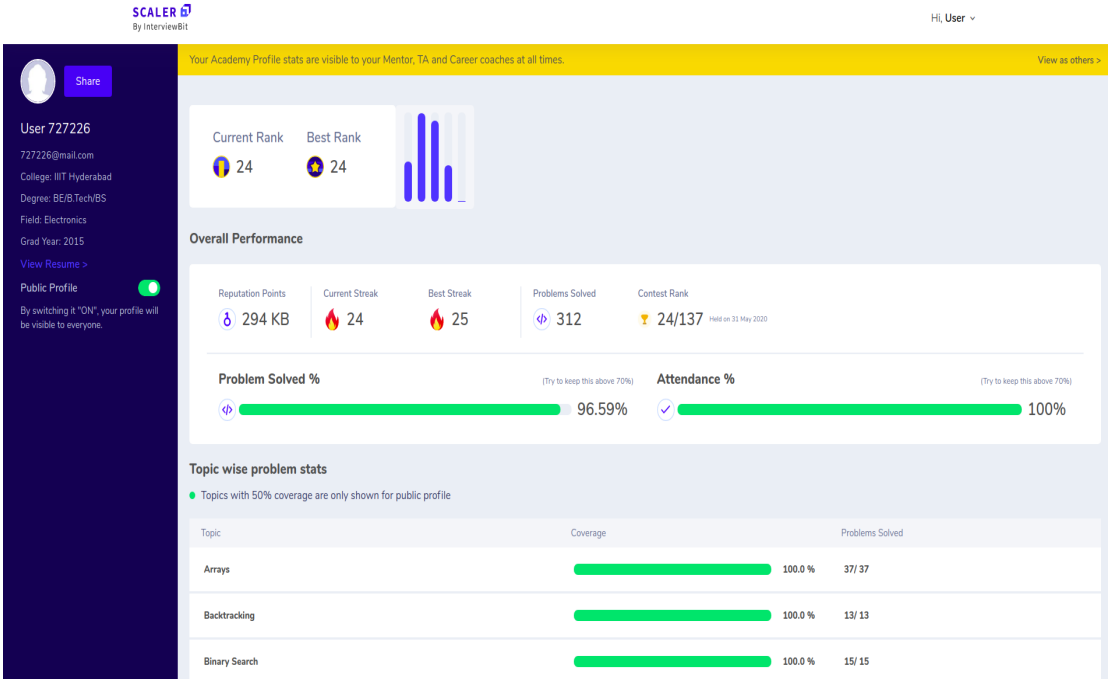

Figure 5.1: User Academy Profile Stats (Desktop version)

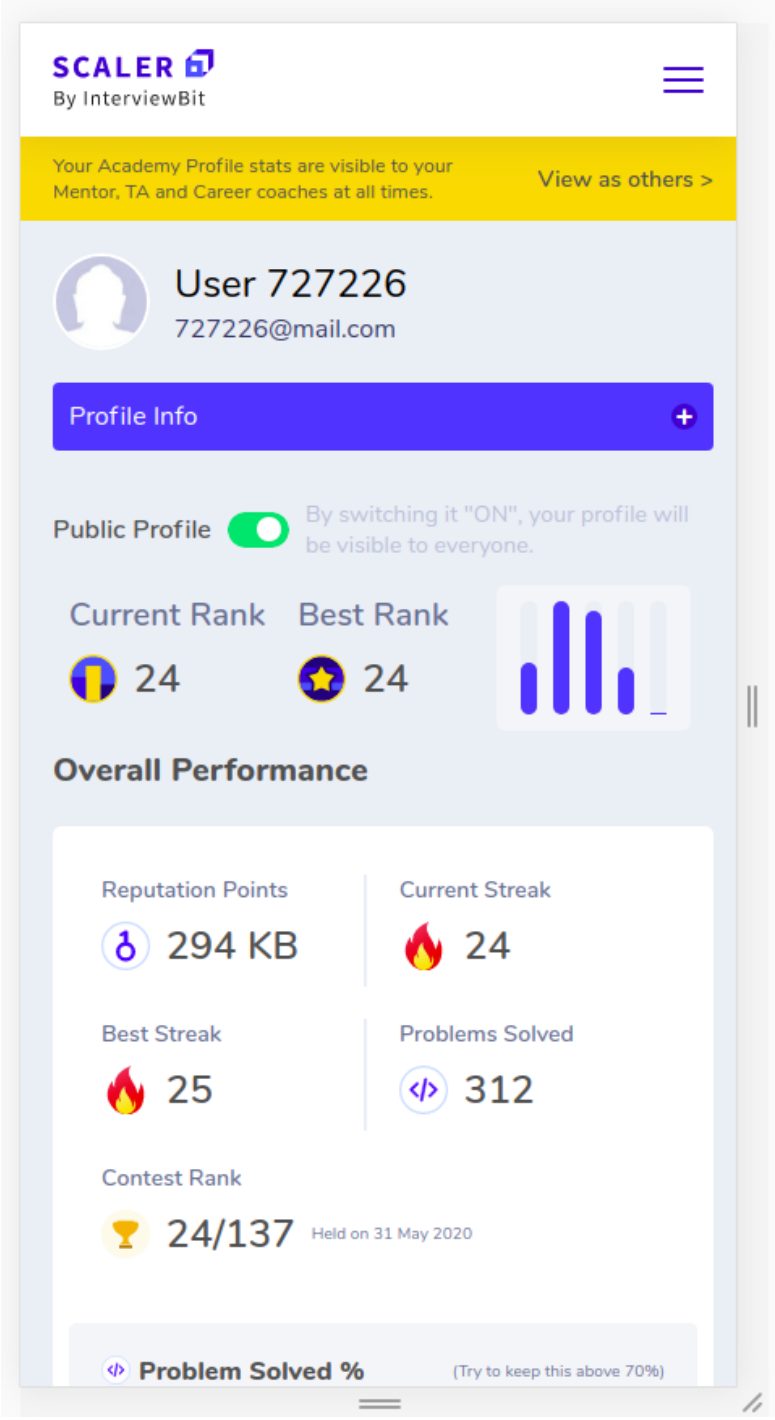

Figure 5.2: User Academy Profile Stats (Mobile version)

5.1.2 Automated Streak Reward Mailer

A one-time reward system for completing each of continuous 45, 60, and 90 days coding streak. For streak 45 continuous days, a 1:1 session with top tech career coaches is provided, as shown in Figure 5.3. For completing a streak of 60, an interview session is rewarded by Scaler team member as shown in Figure 5.4. A Cron job runs daily around 8 pm which increments/decrements the streak day by one/half if the user score above/below the threshold score respectively.

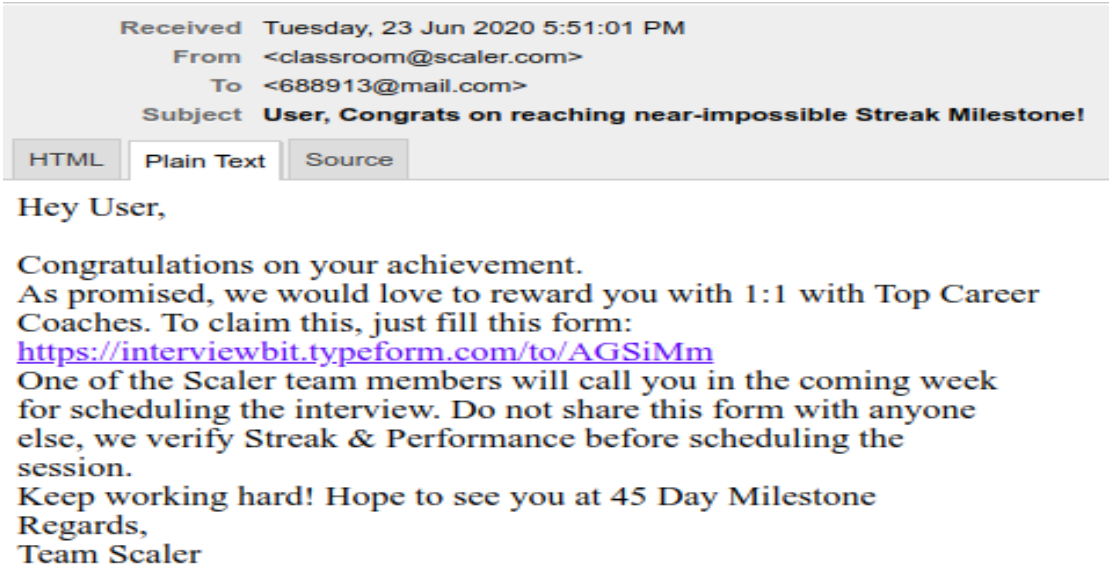

Figure 5.3: Reward for completing 45 days coding streak

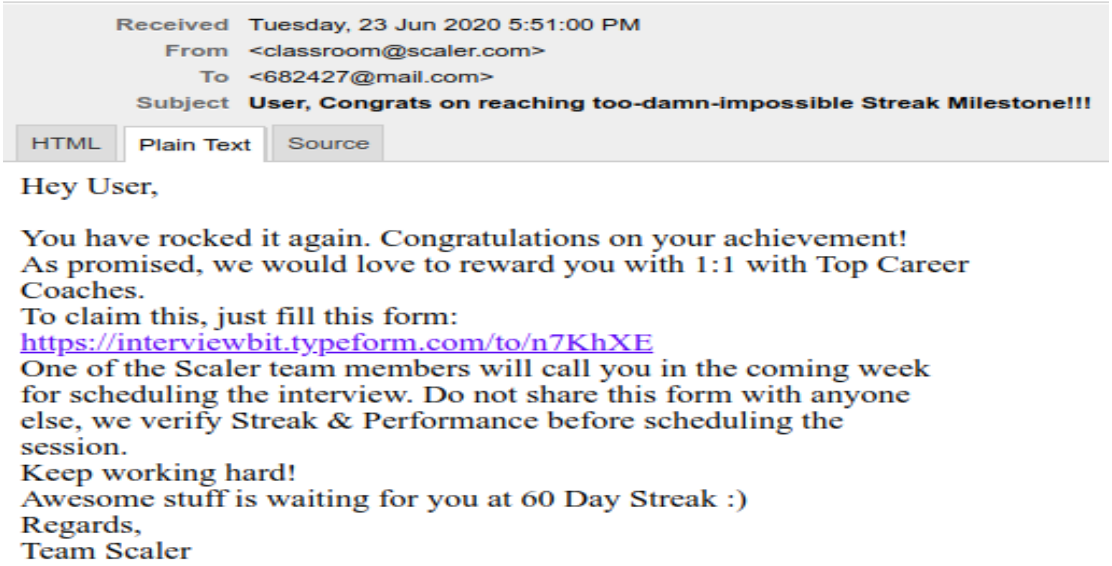

Figure 5.4: Reward for completing 60 days coding streak

5.1.3 Classroom Rank And Missed contests

Initially, if a mentee was unable to participate in a contest, then it shows as "absent" which is obscure. Also, we need to add a trophy as a reward for the top 3 performers in the contests. Hence we re-build the whole model according to the requirements. Figure 5.5, for a user represents if some user did not participate in the contest it shows as "missed" which is quite meaningful and we have also added trophy for top 3 performers for a contest they participated in.

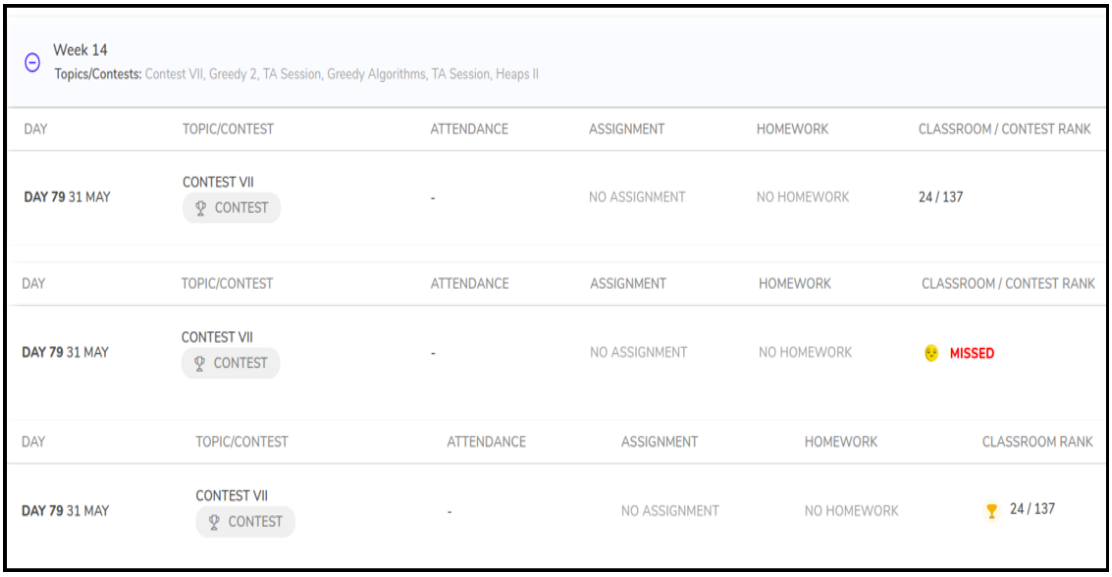

Figure 5.5: Classroom Rank and Missed Contest

5.1.4 Scaler Academy Class Notification

We did not have any method to automatically notify students about the re-scheduling of class/session timings. We develop an automated message portal where a mentor can choose between sending a message or not notify the students respective for that class/session. Figure 5.6, shows a prompt message for mentors to decide whether they wanted to send the notification message or not. Figure 5.7, shows the actual glimpse of the notification message that was sent to the users.

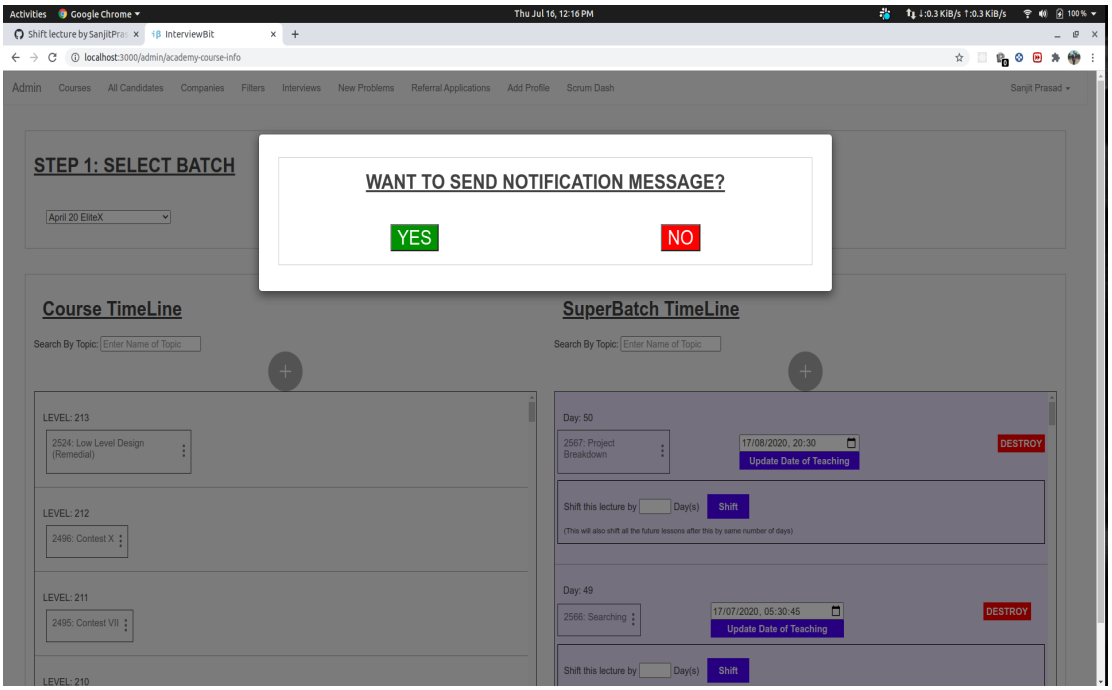

Figure 5.6: Scaler Academy Class notification prompt

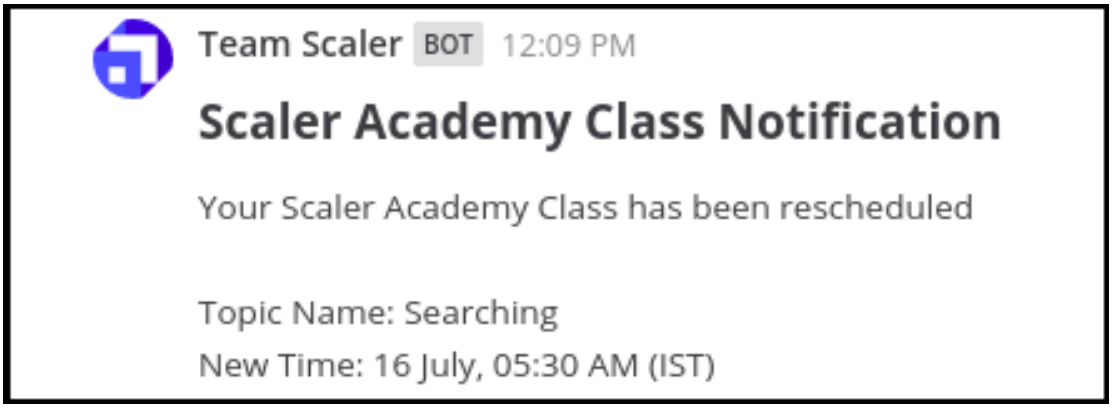

Figure 5.7: Scaler Academy Class notification message

5.1.5 Global Leaderboard For All Contests

We develop a Global Leaderboard page from scratch where a user can access any contest leaderboard details. The problem is a user can not access previously held contests leaderboard. Hence, we need an efficient solution which can show the contest result Global Leaderboard for any contests. The contest data were initially present in Redis-cache and fetched from there. We build a state-based Global Leaderboard which automatically updates the data to cloud storage (AWS) at the end of the contest shown in Figure 5.8.

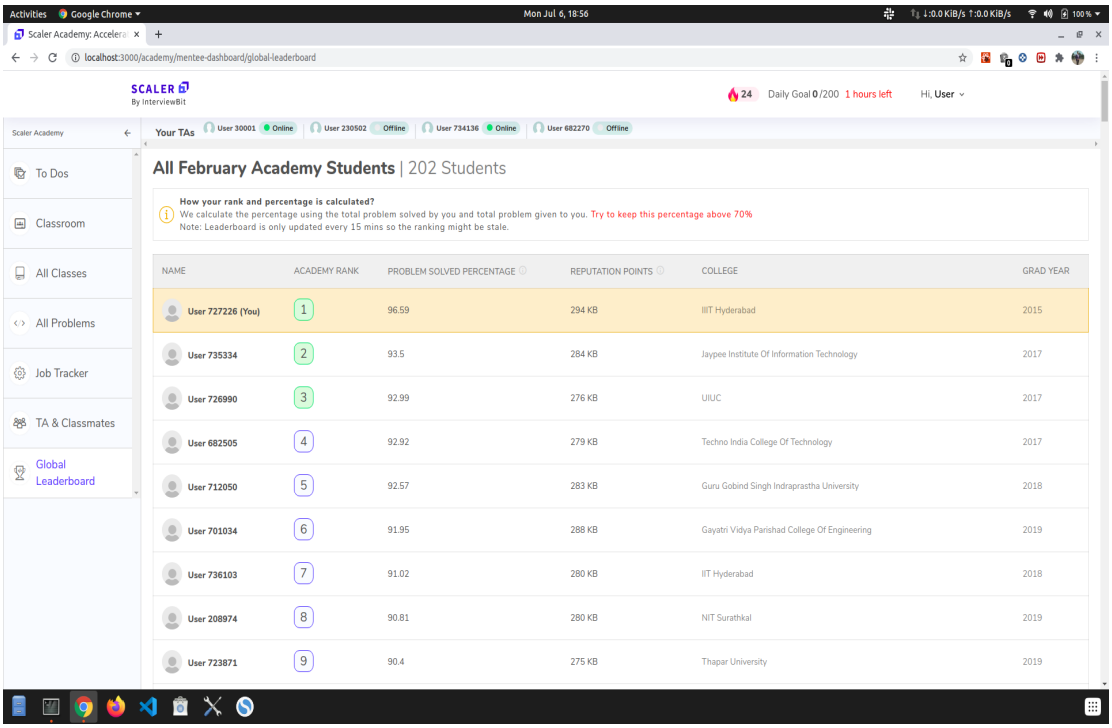

Figure 5.8: Global Leaderboard for a Contests

5.1.6 Toggle Topic View

Initially, the problem topic tags for all the problems are shown by default, as shown in Figure 5.9. Hence this creates a hint for the approach for solving the problems which create a kind of cheating strategy. Hence, we added a toggle button for showing/hiding the problem topic tags in the navigation bar shown in Figure 5.10, which toggles between show and hide the problem topics.

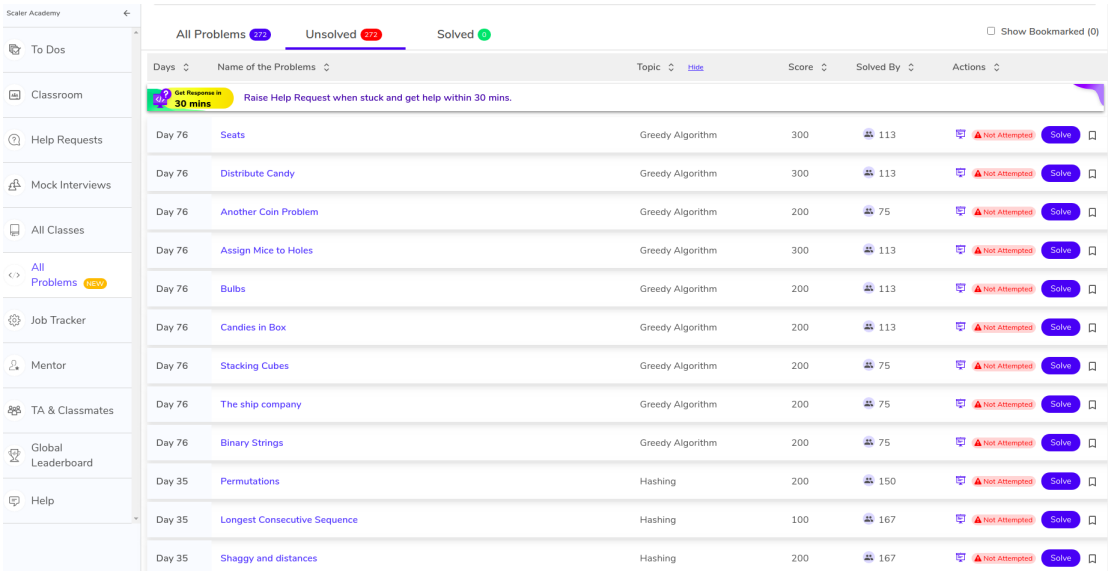

Figure 5.9: Problem topic tags are shown

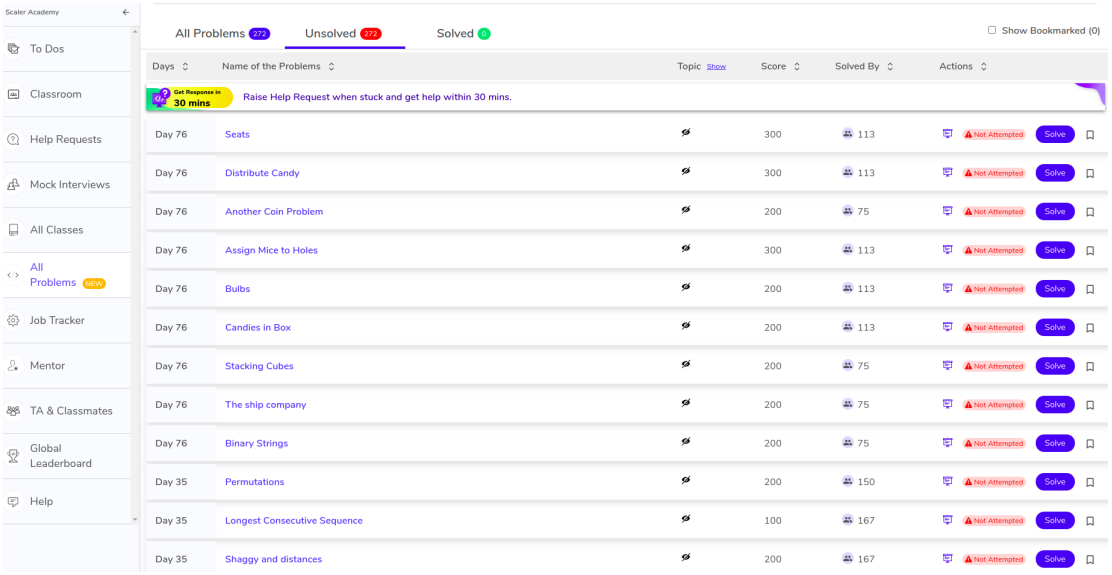

Figure 5.10: Problem topic tags are hidden

5.1.7 User Subscription Date Change UI

We did not have any UI for updating the contract end date of a user's subscription. Every time we need to access the database and update the dates accordingly from there. We develop a UI as shown in Figure 5.11, based contract end date updating from an admin panel where the admin can select from any date from the calendar and the chosen date will be updated automatically via a SQL query in the database.

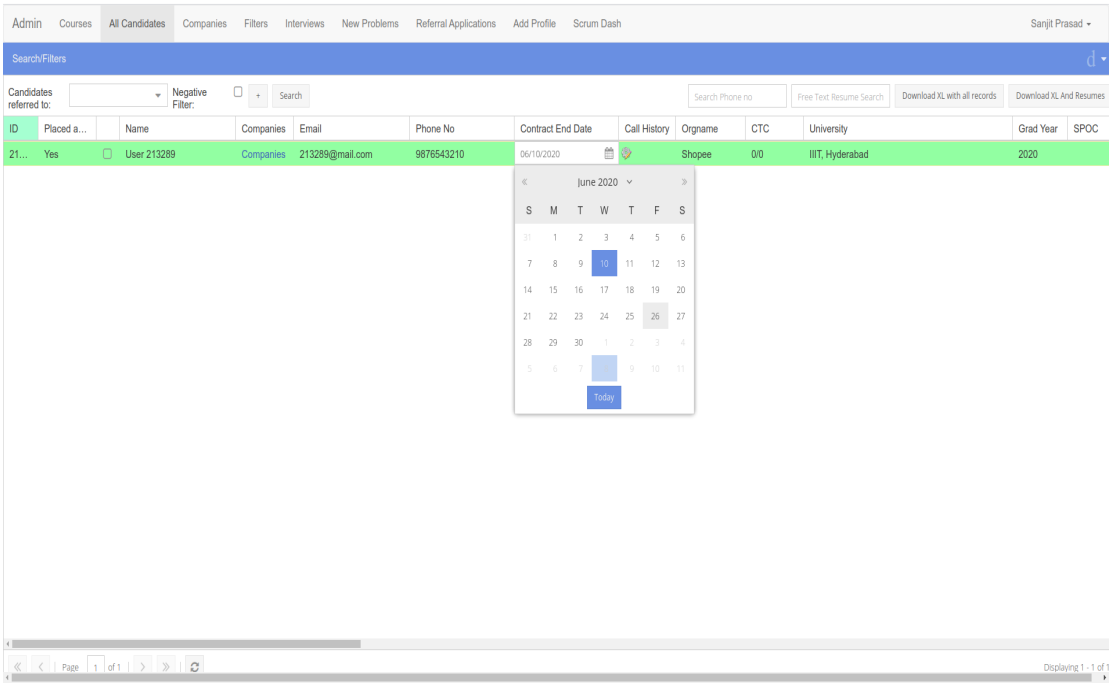

Figure 5.11: UI for updating contract end date

5.2 INFERENCES

The main objectives of my internship tasks was to enhance the user experience on Scaler platform and build features according to their need, feedback and company requirements. All the tasks were performed under the guidance of my team leader. And the entire functionalities was deployed on portal. Learnt many new technologies which are the future in this new era of revolutionising world. Moreover learnt new web technologies such as RubyonRails, JS, React.js and Redux. My work was applauded by my mentor and Director of the company. As a result of the efforts I put into the internship was awarded with a Pre-Placement Offer.

CHAPTER 6

CONCLUSION

Being the first internship experience at startup company, this internship offered a lot of learning and awareness of the world of corporate work. Sprints, schedules, demos, workshops are part of every organization that tells you that there is a lot more than just writing code and programming. There are also social and individual skills that are similarly important to an employee. The essence of the role has demonstrated that it is necessary to consider the specifications of end consumers who will eventually use them.

The skills gained from continuous learning at the organization certainly allowed me to easily implement the tasks needed. The knowledge gained prompted the mind to analyze the know-how of various applications curiously, aimed at seeking the most optimal solution. The team commended the skills displayed throughout and the project head was on schedule when the report was created. The key goals of the internship assignment allowed me to learn a lot of new technology and also gave me the requisite insight into challenges in the real world. In terms of time, expense, and precision, it taught me not only to perform output-oriented work but also to perform productive work. Apart from technical skills, I gained various soft skills such as team management, interpersonal skills, and presentation skills.

As this project aimed to recognize and overcome possible bottlenecks, it has helped me develop critical skills to understand current technology and to use my expertise to strengthen its reliability and build up its reliability. The key aims of the internship were accomplished and all the challenges were solved, improving the academic department's productivity and finishing the assignment in far less time. Ultimately, the role was ready for the end-user to use.

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