

ContestNotifier: A Web Application for Tracking Programming Competitions

Kunal Sharma
Miet, Meerut Meerut

Mayank Agarwal
Miet, Meerut Meerut

Shivam Kumar
Miet, Meerut Meerut

ABSTRACT

Programming has become a vital skill for securing a job in the Information Technology field, as it is used to assess a student's problem-solving abilities. Students with technical backgrounds are encouraged to practice their programming skills on various platforms. Various websites like HackerEarth, HackerRank, LeetCode, etc., conduct coding challenges and hackathons for students and working professionals. However, many participants miss ongoing challenges, which has led to the need for a platform that can notify them about upcoming competitions.

The project being developed aims to address this issue and also help students keep track of their performance to identify areas for improvement [1][4]. This new web app provides customized notifications for coding competitions and hackathons, tailored to each user's individual interests and preferences. The technologies used in this application stack include ReactJS for the front-end, and ExpressJS, ReactJS, and Python for the back-end [1][2].

The application provides several features such as generating a list of programming contests based on filters, receiving notification alerts an hour before a contest starts, sharing contests with friends and fellow contestants, and allowing users to see their profile data from each platform. Users can also set notification priorities based on the contest platforms [1].

Keywords

ExpressJS, MERN stack, Python NodeJS

1. INTRODUCTION

Learning programming is not as daunting as it may seem [1]. Programming involves learning the concepts, various data structures and algorithms [1]. And testing them by participating in various competitive programming contests and hackathons that are conducted on various websites like codechef, hackerrank, hackerearth, geeksforgeeks, leetcode etc [1, 2]. Getting good knowledge of coding and the data structures and algorithms involved is a time consuming task [1]. The Knowledge of coding has become a necessity in today's market as the knowledge of data structures and algorithms are used to assess the problem solving ability of the students [4]. Keeping track of all the past, present and future contests is becoming very difficult as the online opportunities and websites conducting these contests are increasing rapidly [1, 4]. There will always be a need for a platform to get notification of all the upcoming contests and hackathons from various websites [1, 3]. The project being developed addresses the aforementioned issue and additionally assists students in monitoring their performance, enabling them to identify areas for improvement. [1, 3]. The end-product will be a web application which anyone can use to set custom notifications about the coding competitions and hackathons [1]. The technologies that we are using in this application are: ReactJs in the front-end,

MongoDB and In the backend we have used ExpressJS and ReactJS, Python [1]. Some features provided by the application are generation of list of programming contests based on the filters, get notification alert an hour before a contest starts, share contests with your friends and fellow contestants, users can see their profile data from each platform, setting notification priorities based on contest platforms [1].

2. Literature Review

2.1 Existing System

2.1.1 CPTracker

The application being developed will track and display past, live, and upcoming coding competitions from the most popular sport programming sites including HackerRank, HackerEarth, Leetcode, Codeforces, Codechef. This will provide users with a comprehensive overview of coding competitions taking place on these platforms.

Contests are categorized into three routes for easy navigation within the application. Each of them is color coded for better user understanding ie: past, present, future. Each coding competition listed in the application includes a direct link to its respective programming site. This feature allows users to easily visit the contest page with a single click and add the contest to their Google Calendar for convenient reminders.

Build

The application is constructed using ReactJS for its frontend, ExpressJS for Cross-Origin API calls, and MaterializeCSS for its UI library. It has been deployed on Heroku for efficient and reliable operation. The developers would like to extend special thanks to clist.by API for their assistance in creating this project.

2.1.2 CPfy

CPfy started as an effort to help contestants share contest information in our social media group easier and more efficiently.

It basically allows you to see a list of programming contests based on the filters you set like contest start time, end time, duration, platform to choose what list you see, as well as alerts you an hour before a contest starts. Set notification priorities based on contest platforms.

Build

This app is built with Kotlin following MVVM pattern all api calls with the help of OkHttp

2.1.3 Coding Schedule

The Coding Schedule application aims to inform the competitive programming community about past, present, and future programming contests taking place on popular platforms such as Codechef, Codeforces, and Hackerrank. Its main feature is the "notify-me" option, which provides users with a

notification before the contest begins. Users can also set an alarm by adjusting the settings in their mobile calendar. This functionality ensures that users never miss an opportunity to participate in coding contests and stay updated on their favorite platforms. The app offers users customizable layouts and colors, as well as a custom notifier for personalized alerts, enhancing their experience and engagement.

3. PROPOSED SYSTEM

3.1 System Description

The platform is designed to provide access to various coding challenges and contests taking place across different coding platforms. Its aim is to enable college students to stay up-to-date with the latest opportunities for growth and learning. Through the platform, students can access information on past, current, and upcoming contests, and filter notifications based on their preferences. Additionally, contest alerts are provided to ensure that students receive timely notifications, with alerts being sent an hour before the start of each contest. Once students participate in a contest, their performance is ranked on a leaderboard, enabling them to track their progress. The platform's unique feature is the ability to display user profile data from different platforms on a single platform, providing a comprehensive overview of performance in various coding competitions.

In summary, the platform serves as a centralized hub for coding contests and challenges, providing students with the means to stay informed, engaged, and competitive in the rapidly evolving field of coding.

3.1.1 Process Visualization

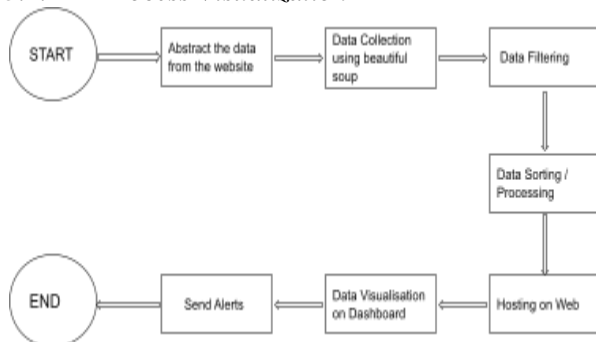


Figure 1: Process Visualization

3.1.2 Features

- Modularity
- Open Source
- Scalability
- Extensibility
- Front-End and Back-End Independence
- Ability to scale up or down
- User Data Dashboard
- The application was constructed using ReactJS for the frontend, Python for enabling cross-origin API calls, and CSS for the user interface library.
- The profiles are fetched using API calls and given to the front end.
- All the past, present and upcoming contests are listed on the dashboard using ReactJS.

- Api data is manipulated using ExpressJS to customize the notification and filter of the contest Api.
- It has a custom notification for the priority according to the user's need.

3.2 Micro services

3.2.1 Authentication Service

The Authentication Service is a crucial component for ensuring the privacy and safety of users. It operates based on the use of passwords, similar to the mechanism used in time-sharing systems. To use the service, customers are asked to provide their email address, which is then verified against the company's servers. Once the verification is successful, customers are granted access to their accounts.

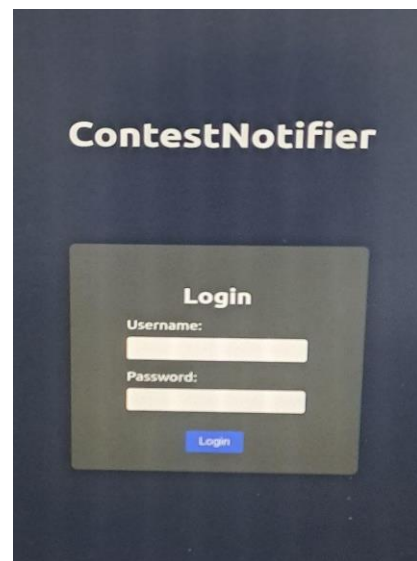


Figure 2: Login Page

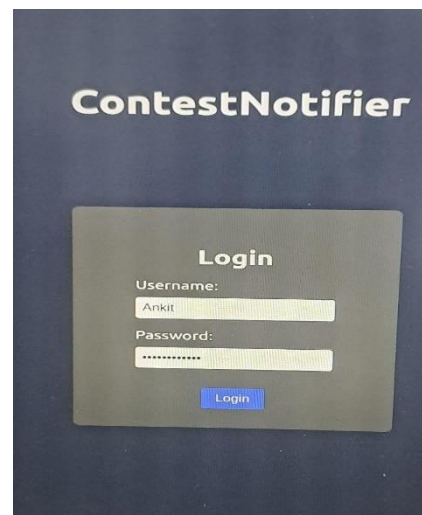


Figure 3: Login Authentication



Figure 4: Login Complete

3.2.2 Contest Service:

The platform provides users with a comprehensive list of programming contests that can be filtered based on their preferences. In addition, the platform sends alerts to users one hour before the start of a contest. One of the platform's notable features is the use of APIs to curate the list of contests from various websites. Apart from these, users can access information about previous, ongoing, and upcoming contests, and track their progress on the platform.

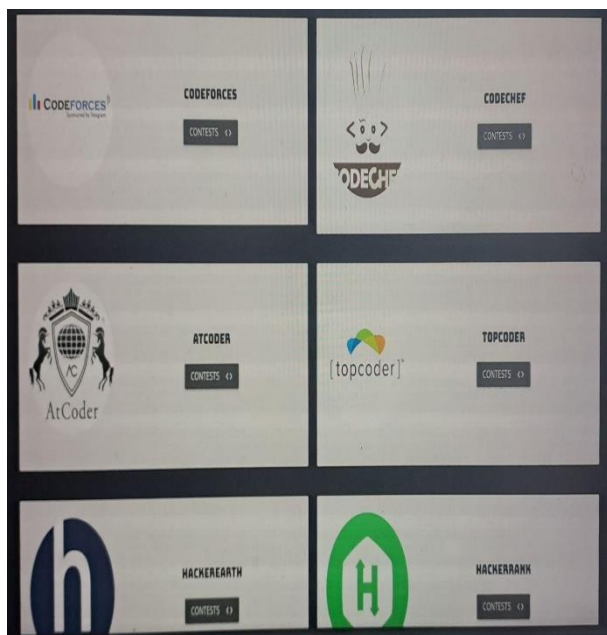


Figure 5: Contests from different coding platforms

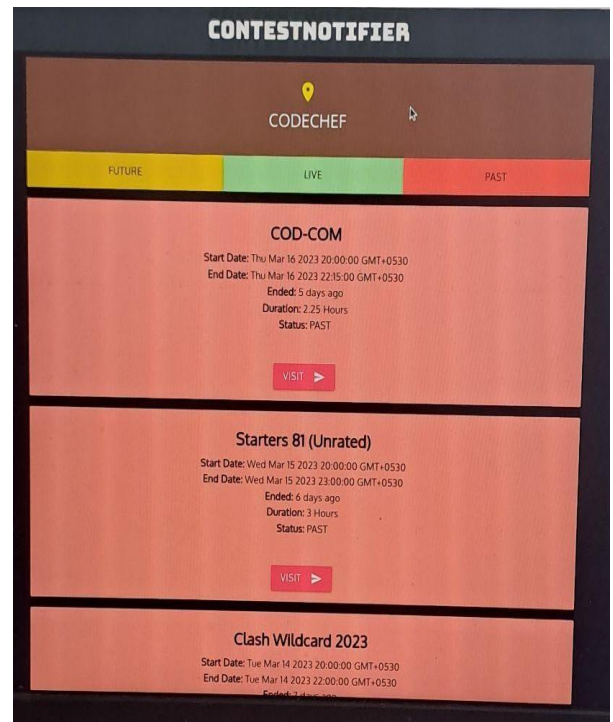


Figure 6: Codechef Past Coding Competition

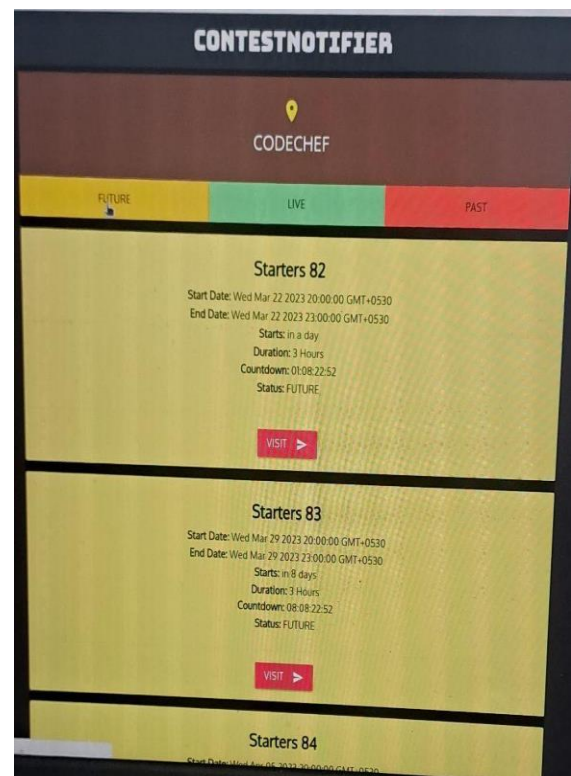


Figure 7: Codechef Future Coding Competition

3.2.3 User Data Service

The User Data Services on the platform are responsible for storing and maintaining user profile data, as well as the contact information of customers. The service comprises a dedicated database that stores separate profile data and user credentials information, thereby ensuring the security of user information on the platform. Additionally, the platform offers a feature that allows users to access their accounts on multiple coding

platforms, thereby enabling them to track their progress seamlessly without having to switch between different platforms. This feature saves time and enhances the overall user experience.

4. SIGNIFICANCE

The successful implementation of this project would be beneficial for students as it will encourage them to participate more regularly in competitive programming contests across various platforms. By doing so, students will gain a better understanding of data structures and algorithms, which will help them secure better job opportunities. The platform will notify students of upcoming contests, enabling them to participate in a maximum number of coding contests and hackathons. This will, in turn, enhance their programming skills and increase their rating on various platforms, resulting in a better coding portfolio and better job placements.

5. CONCLUSION

The Contest Notifier for students may appear simple, but upon successful implementation, it can greatly benefit students by encouraging them to participate more regularly in competitive programming contests across various platforms. This can lead to a better understanding of data structures and algorithms, resulting in better job opportunities. The project has the potential to be developed into a full-scale product that eliminates the need to visit multiple coding platforms to check for past, present, and future contests. Students can set custom notifications to never miss a contest and access all the information on a single platform, enhancing their user experience.

6. REFERENCES

[1] R. K. Singh and R. K. Chauhan, "A Systematic Review of Web-Based Programming Contests and Hackathons,"

International Journal of Information and Education Technology, vol. 10, no. 2, pp. 98-103, 2020.

- [2] T. R. Santos, V. F. Silva, and F. D. D. Oliveira, "A survey on online judges for programming contests," 2016 IEEE Frontiers in Education Conference (FIE), Erie, PA, 2016, pp. 1-6.
- [3] R. K. Singh and R. K. Chauhan, "A web-based tool for tracking programming competitions," 2018 3rd International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU), Bhimtal, 2018, pp. 1-4.
- [4] P. R. Oliveira, C. P. de Oliveira, and R. L. Santos, "A Review on Programming Contests and Their Impact on Education and Industry," 2018 IEEE Frontiers in Education Conference (FIE), San Jose, CA, 2018, pp. 1-6.
- [5] Jürgen Hausladen, Birgit Pohn, Martin Horauer, "A cloud-based integrated development environment for embedded systems", Mechatronic and Embedded Systems and Applications (MESA) 2014
- [6] IEEE/ASME 10th International Conference on, pp. 1-5, 2014.
- [7] Shih-Chieh Su, Chih-Chang Yu and Chan-Hsien Lin, "Development of a web-based programming learning platform," 2016 International Conference on Fuzzy Theory and Its Applications (iFuzzy), Taichung, 2016, pp. 1-1.
- [8] F. Thung, T. F. Bissyandé, D. Lo and L. Jiang, "Network Structure of Social Coding in GitHub," 2013 17th European Conference on Software Maintenance and Reengineering, Genova, 2013, pp. 323-326.