CVWO Assignment Final Submission Write-up

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Introduction:

Before starting on this assignment, I had almost no experience at all in web development so over these few weeks, I have really learnt a lot of new things even though it wasn't really an easy process. It took me around 10 days of playing around with React and Ruby on Rails to understand the basic concepts to just get started and looking at what I have accomplished now, I would say that I am proud of what I have done so far even though there is a lot of room for improvement.

Learning Process and Reflection:

React: I spent a lot of time learning react and I would say that I worked more on React compared to Rails because I had more experience in JavaScript compared to Ruby. I was already familiar with JavaScript so I learnt and used Typescript for the frontend to make sure the application was type safe and it actually made my life easier by pointing out errors during compilation and reducing the chances of runtime errors. I also implemented Redux Toolkit which made managing my app's state way easier and I also chose Redux toolkit because it had a lot lesser boilerplate code compared to Redux.

UI/UX Design: Moving on to UI/UX design, I believe that a well designed app that looks more appealing to users can significantly improve their experience using the app. Initially I had a lot of plans for the design but I focused more on the functionality of the application and left the design towards the end. I should have done it concurrently because I had very little time to work on the design and I couldn't make what I wanted happen in that limited time. Also, I chose to use Material-UI as I liked its design and it was very well documented. I would say that I am not entirely satisfied with the current design but I will definitely continue to work on it after this.

Ruby on Rails: Ruby on Rails is a really powerful backend and it abstracted a lot of common tasks and reduced the need to write boilerplate code. I didn't really work much on the backend other than implementing user authentication using JSON Web Tokens and I also did not spend a lot of time learning Ruby so I felt more comfortable with working on the frontend but I think I could have made a lot of things easier if I used Rails more rather than doing everything in the frontend. I still have a lot more to learn but I will certainly work on it .

Docker: Towards the last 2 weeks, I wanted to focus more on implementing other things like docker and focus less on implementing more and more functionalities as I just wanted to learn more new things. Hence, I learnt how to use docker and it turned out to be really useful and even made my life easier during deployment. The documentation wasn't a lot but I made the best out of it and just played around with it until it worked. I am really thankful I used Docker because during the last week, something went wrong with my WSL

on windows and up till now I can't run my application locally but Docker saved me from the pain of troubleshooting and allowed to me to focus on the development for the time being.

AWS: I have never deployed any web application before and I initially wanted to deploy it on Netlify or Heroku but I heard AWS was quite hard to deploy on and will be useful in the long run so I took it up as a challenge. It was really hard to understand what was going on behind the scenes and it spent almost 4 torturous days trying to get it up and running. Even though using Docker helped me a little, there was really very little documentation on how to troubleshoot. It took me hours of troubleshooting and messing around with difference services like the EC2 instances, load balancers and Elastic Beanstalk environments to understand what was going on and how to make it work. I couldn't add a custom domain name in time so please check for the latest link in the GitHub repo just in case the given link does not work. I really can't put into words how I felt after I saw my application running for the first time after 4 painful days but it was really worth the experience and now I can comfortably deploy applications on AWS.

Work in Progress:

There were a lot of things I set out to do at the start of the assignment but I couldn't really implement all of them by the deadline. This was mainly because I didn't have enough time to work on all of these as I had to go back to India for 3 weeks during the holidays and I couldn't really spend as much time as I wanted to on the assignment. Similarly, after school started, I could only work on the assignments in the small pockets of time here and there.

- Third Party Authentication with Google, Facebook, etc.
- Cron jobs and Recurring Tasks
- Integration with Email APIs like Amazon SES or SendGrid for notifications
- Using a CI/CD pipeline
- Adding a custom domain because the default URL looks messy

I also felt that my code was not as neat and tidy as I wanted it to be and I need to work on making my code more readable. Nevertheless, I am satisfied with what I have accomplished over these few weeks and I will definitely learn more about all these features and continue to implement them even after the assignment ends.

User Manual:

1. Sign Up:

   Fill in your email, name and password and you will be automatically redirected to the Home Page of the app. Please take note that one email address can be associated with only one account.

2. Log in:

   To log in , just fill in your email and password that you used when you signed up and if the credentials are valid, you will be signed in and redirected to the Home Page. If the credentials are invalid, you will be prompted and asked to try again.

3. Home:

   At the home page, you will be able to see 4 box views which contains the list of tasks due today, due this week, overdue tasks and a progress bar. Click on the Add/View more tasks link at the bottom of the page to view or add more tasks which will redirect you to the View Tasks page.

4. View Tasks:

   This page lists out all the uncompleted tasks and there is a button at the top right corner of the page for you to create a new task.

   a) To mark a task as completed, just click on the checkbox on the task.
   b) To edit existing task, click on the edit icon on the task and a dialog will open for you to change the existing values.
   c) To delete existing task, click on the delete icon and it will delete the task for you.
   d) To list all the subtasks associated with the task, click the dropdown icon and it will display the list of all subtasks along with a button to add a new subtask.
   e) The functionalities of subtasks are exactly the same as task.

   You can also search for tasks using the search bar and for advanced search, click on the filter icon next to the search bar to filter using deadline, tags, etc.

5. Completed Tasks:

   This page lists out all the completed tasks and you can uncheck the checkbox on the task if you accidentally marked it as complete.

6. Account Management:

   You can edit the information associated with the logged in user such as the username or the email. To change the password, you have to fill in your old password as well for verification and if the password does not match, you will be prompted to try again.

Conclusion:

I am really happy that I took up this assignment as it really helped me to learn a lot about web development. It taught me a lot of other skills such as troubleshooting, patience, etc. For example, when I was trying to deploy my app on AWS, every time I tried to deploy it, it would always say none of the instances were sending data. After hours of troubleshooting was when I realized that it was just because I was using the t2.micro instance under the free tier which had only 1GB of memory and all I had to do was just wait for at least 30 minutes for it to start working.

It was certainly a tough journey with a lot of setbacks but I had something to take away from each of it. I would also like to thank Siva for encouraging us to do this assignment during our 1101S tutorial without which I don't think I would have started it. Finally, I would like to express my gratitude to the CVWO team for this opportunity regardless of whether I get in or not. I have always wanted to start learning web development for a very long time and this assignment paved a way for me to do it in a very short time.