Stage 6: Project Report and Demo Video

1. Please list out changes in the directions of your project if the final project is different from your original proposal (based on your stage 1 proposal submission).

Throughout the process of developing our application, we had to make a lot of changes on what we could accomplish due to various complications that arose. For one, we had to reevaluate the manner in which we sent our SQL queries to the backend. Originally, we had planned to send parameters and construct the queries in the backend. However, we later realized that it would be easier to write the queries in the frontend and send the queries to the backend. We also originally planned to use React.js, but due to the complications involved with using our backend with a dynamic framework, we decided to do the frontend in native javascript.

2. Discuss what you think your application achieved or failed to achieve regarding its usefulness.

I think our application achieved being a great way to showcase Youtube Trending Dataset data in a user-friendly way. Our goal was for the user to be able to analyze videos from different regions and their attributes and our charts look amazing. I think they would be very useful for people or researchers curious about what kind of videos are being shown to what regions and see how the likes/dislikes are like for those videos easily. On the other hand, I think we failed to make the application editable by the user. We ran out of time and ran into problems that didn't allow the user to modify the graph depending on what they wanted to see in real time. Being able to choose what attributes to show would have made this application even more useful and interesting.

3. Discuss if you changed the schema or source of the data for your application

Originally, we had planned to find data online on major comments for trending videos through some webscraping and then use that for the data. However, this ended up being a more complicated process than we anticipated, especially when we began accounting for parent and child comments. Due to this, we were forced to auto generate the comments as Lorem ipsum text. We also had to remove video descriptions due to the fact that the description was large to a point that it was implausible to store, and it also had unrecognizable special characters.

4. Discuss what you change to your ER diagram and/or your table implementations. What are some differences between the original design and the final design? Why? What do you think is a more suitable design?

The ER diagram remained the same throughout the project. The original design we developed at the beginning of the project ended up being very accurate to the data and we were able to keep with essentially no changes. However, in the future, I would likely remove the user table, as it is pretty redundant and purely operates as a container for the channels. Since the comments were auto generated, random users were assigned to comments, but it could just as is easily use channels as a foreign key instead.

5. Discuss what functionalities you added or removed. Why?

A feature that we removed to prioritize the functionality of the entire project was the usage of dynamic site elements. Because of certain server issues relating to data retrieval, we had to switch from using React to basic Javascript. A functionality which we added was because we were unable to connect our backend to a new React frontend. Initially we had it on javascript and had it connected to our backend for the midterm demo. However, it stopped working when we switched to React.

6. Explain how you think your advanced database programs complement your application.

Our advanced database programs complement our application by providing the seamless storage and querying of the data required to display our graphs. This is because querying could be done simply by creating a string that matched an SQL query, and then sending the string to our backend for running. This made it very easy for us to build custom queries based on user input, as we simply needed to use string concatenation. Additionally, our backend returned the query results in an easily navigable dictionary structure, which made the coding process much easier.

7. Each team member should describe one technical challenge that the team encountered. This should be sufficiently detailed such that another future team could use this as helpful advice if they were to start a similar project or where to maintain your project.

Akash:

One technical challenge we encountered was querying and storing the data from the backend. It was complicated since we didn't want to remake our entire frontend because it would not connect. Our post request would not fetch the data even though we tested our queries directly on the backend. We decided to scrap our React frontend and go back to our working javascript primitive user interface. We got too ambitious. Helpful advice is using what you know already works before moving onto new technologies. In this case we changed from javascript to react after the midterm demo and encountered problems.

Nihal:

The main technical challenge that we had to deal with was the fact that PyTorch, the system which we used to connect the frontend and backend of our project did not work with React.js. In stage 4, we developed our backend and used a simple native javascript website to serve as our frontend. For stage 5, we planned to shift the frontend to a dynamic site with React.js. However, this did not work fluidly with PyTorch, and since we compartmentalized the work, we did not realize how much of a struggle connecting the two would be until we were done with both. Due to this, we had to scrap our initial frontend and it got rewritten in native javascript on a time crunch, so the site wasn't quite as appealing as it could have been. This shows that in the future, it is wise to test that frameworks are compatible before implementing them.

Kevin:

One technical challenge that we encountered was the difficulty of learning Javascript for the first time and implementing it at a decently high level. At first, I was having trouble understanding how javascript declarations worked as well as how to display site elements. However, resources such as stack overflow along with the experience of my other teammates really helped me overcome these obstacles. My advice would be to stick to a programming language that other teammates understand at a high level, as that makes it very easy to learn as you have someone to walk you through the language.

Derek:

Our database got deleted by someone and set us back for at least a couple hours. Good thing we found it out fast and rebuilt the database from scratch and we managed to build it back up before the demo time. Lesson learned is that never push anything that is confidential or crucial to connecting to any of the database or virtual machine. I tried to host the backend on both GCP cloud run and GCP app engine, both had weird issues that made it difficult to connect to, I can't figure out the correct header which caused different errors with unsupported media type etc. The lesson here is don't try new stuff when you are on a tight schedule, especially something related to network security.

8. Are there other things that changed comparing the final application with the original proposal?

One such thing that changed from the original proposal was our decision to leave out the line graph comparing watch times of trending videos in different regions. This was because watch time data was not initially in our database, and scraping such data would've taken a lot of unnecessary effort. We decided to stick with what was realistic and display trends that existed in our original database.

9. Describe future work that you think, other than the interface, that the application can improve on

I think the application could be improved on through web scraping of youtube comments themselves for further analysis. We initially debated web scraping top trending video comments for patterns to show to the user. However, in the end we ran out of time and ran into other issues. In addition, I believe we could make our advanced queries even more analytical for the user by having like top 5 videos shown to over 3 regions with over 20000 likes or something even more interesting to visualize. We only thought of this at the end but are still happy with our advanced queries now.

10. Describe the final division of labor and how well you managed teamwork.

We divided up the tasks and worked together at CIF, so we could ask each other for help as soon as possible. Derek worked on the backend and connected it to the frontend. Nihal worked on processing/cleaning data and both backend/frontend setup. Akash worked on the React/Javascript front end and visualization. Kevin worked on frontend and also how to query and store data from the backend. We all worked on each part together like the database design and debate about how we want to go about our frontend. I believe this was a good way we managed teamwork and got to hear everyone's thoughts and input.

Video:

https://drive.google.com/file/d/1iHtM4BjQDBUfNQrvYbAmkZn9Hg6YVoL8/view?usp=share_link