Project Report

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).

In our Stage 1 proposal, we planned to create an itinerary planning platform with basic filters like price and ratings. While we stayed true to this idea, we added extra checks for dates and availability to make the platform more useful. However, we couldn't include the feature to share plans with friends due to time limits and instead focused on improving the main features.

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

The travel planner application provides useful features like filtering based on price, ratings, and availability, helping users plan their trips without switching between multiple platforms. It serves as a one-stop solution to keep track of accommodations like Airbnbs and flight bookings, ensuring all travel details are organized in one place. This integration simplifies the planning process and saves time, offering a seamless experience for travelers. The application also uses transactions to ensure data consistency between users, making it reliable for multiple users accessing and updating information.

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

The schema and data sources for the application were not changed. We followed the same schema outlined in the proposal and used the datasets as originally planned.

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?

We did not make any changes to the ER diagram or table implementations. The final design aligns with the original design proposed. We believe the original design was suitable for the application's requirements and effectively supported its functionality.

Discuss what functionalities you added or removed. Why?

We added date validity and availability check filters to ensure users receive accurate and up-to-date information when planning their trips. These features improve the reliability of the application by validating dates and confirming the availability of Airbnbs and flights before bookings.

However, we decided to remove the plan-sharing feature due to time constraints. This allowed us to focus on perfecting the core functionalities and ensuring they worked reliably. Future iterations could reintroduce this feature to make the application more collaborative.

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

Our advanced database programs play a key role in enhancing the functionality and reliability of the application:

- Advanced Queries: These enable users to filter and find Airbnbs or flights that best match their preferences, such as price or ratings, and sort the results for a more personalized experience.

- Transactions: Transactions help maintain data accuracy by ensuring no two users can book the same listing at the same time, keeping availability counts valid.

- Triggers: Triggers handle tasks like updating segment ordinals automatically, reducing the chance of errors.

- Procedures: Procedures check date validity and the availability of listings, making sure users always receive accurate and up-to-date results.

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.

- **Data Cleaning** (ppc2)**:** Handling a large dataset was challenging initially, as it required significant time and effort to clean and process. To manage this, we split the dataset into smaller chunks, which made it easier to clean and convert into the required format.

- **Setting everything up** (sirapop3): A key challenge was ensuring compatibility across different operating systems (Windows and Mac) for local development. We used MySQL locally with a GCP cloud instance, ensuring all team members had matching MySQL versions. Each member had their own .env file for environment-specific settings, and Git was set up on all machines for collaboration and version control. This setup ensured consistent development across different environments.

- **Transactions and correct isolation level** (anandan3): Multiple users in our application interact with the same plan or airbnb. If only one seat is left for a flight, two users should not be able to book the same seat. So, the team had to come up with an appropriate transaction and the correct isolation level to execute it at. Since, the transaction comprises a read (to see if the flight is available) and a write (to insert the flight into user plan), we decided on the SERIALIZABLE isolation level to perform the booking correctly.

- **Dynamic Query Construction and Pagination** (asom2)**:** A key challenge was dynamically constructing queries based on frontend filters, which could change frequently. We also needed to implement pagination for large datasets, ensuring the correct subset of data was returned based on page numbers and limits. We addressed this by creating a flexible query system to handle various filter combinations and integrated pagination for optimized performance.

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

In the future, we could implement a plan-sharing feature that allows users to share their itineraries with friends. This would make the application more interactive and collaborative, enabling group planning and better coordination for trips.

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

- anadan3 - Query Creation and Backend Development
- ppc2 - Query Creation and Frontend Development
- asom2 - Query Creation and Frontend Development
- sirapop3 - Query Creation and Backend Development

Overall, the teamwork was well-managed, with clear responsibilities assigned to each member. We held regular meetings to discuss progress and challenges, which helped us work efficiently and complete tasks on time.