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

Compared to the requirements we listed in the 1st proposal, we made changes as follows:

1. Add Releases table to describe the relationship between companies and jobs

2. Add one temporary table named res\_Table to store the number of favorite companies which satisfy the users’ search input in the same time

3. Add one functionality that the database automatically delete surplus favorite companies for users (for example, the companies liked by users a long time ago)

4. Delete the function that can show users’ search history

5. Delete the function that can show detailed location info on clicking

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

Our application makes it easier for users who are using their H1B for employment to search for company information and add some of them to their favorites. In the meanwhile, users can get more useful information on company ranking.

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

The source of data kept unchanged during the whole process. However, we did add two tables to our schema (listed before). And what’s more, we changed the range for data definition when we were trying to import new data in our database. For example, we changed the company\_name from VARCHAR32 to VARCHAR64 to satisfy the needs.

1. 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 change our ER diagram but we did change some table design. In the Location table, we make the actual information to be the key instead of just the id. In the favorite table, we remove the user id from the key. The other remains the same. We change the key of Location because if making the id the key, the actual address might be duplicated and that is not what we want. We keep the Id because we want the database to be 3NF. We change the key for favorite because we sure need to allow users to have more than one favorite company, this design better fits the idea of favorite List.

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

We added a feature that a trending company will appear on the front of the result list because it is fun and we want to introduce interactive elements to the application for the users. If users see their action will change the application, they will be more likely to use the application.

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

The advanced database programs make the application capable to do something more fun. For example, the trending company need to count the people who favorite the requested company each time. it will be time consuming if the database is huge. With the help of trigger, we will be able to finished it with I/O cost of O(1). The store procedure give user to input other than the company name. It is feature that target users who only care about the job title or the location of the job.

1. 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.

It is always helpful to test the code before deployment or the team meeting. We had encountered the issue when the SQL is not tested and took us hours to identify the issued. I think the best solution could be having a smaller local database which you know the answer of the query and test the query.

The original data in myvisajob.com is numerous, when we are trying to web crawl the data, we are forbidden by the website. A potential solution is to set multiple proxy ip before crawling. Also, it takes a long time to crawl such large data, multithreading helps us to greatly reduce the time.

When we need to connecting between frontend and backend, we encounter cross domain problem. Therefore, it is hard to transfer data between backend and frontend. A possible solution is to use proxy in package.json file in frontend.

Yiming Wang: When creating the table schema in database, remember to set the primary key to AUTO\_INCREMENT NOT NULL. Not doing so would make insertion more difficult, and each insertion must have the specific id value.

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

​We added the logic of how to increment the rank of companies which is using trigger so that when the user adds his/her favorite companies, the company rank will improve.

In addition, we also used stored procedure to provide companies rank sorted by how many times they have been added to users’ favorite lists.

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

In the future, we can use transaction to ensure all the transaction have ACID characteristics.

In addition, we can also try to use token to communicate between frontend and backend in order to improve user info securities.

In the meantime, we could also use redis to cache some user access info so that we can respond to request fastly.

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

1. FrontEnd: Yifu Gao, Kanghong Zhao

2. BackEnd: Haifan Wu, Yiming Wang

3. Database & Query Language Design: all team members

At the beginning of each stage, we always scheduled time first so that we could group together and brainstormed different kinds of idea. During the meeting, the main topic is not only how to figure out feasible approaches but also split tasks into four-part so that no member will get overwhelmed by the tasks. In the meantime, we also decided to group together approximately five days before the deadline in order to discuss the next direction we should focus on and whether our previous plan is feasible. Finally, 2 days before the deadline, we needed to merge our code together. Therefore, there may be many bugs showing up so we also gather together to fix bugs so as to make our application runnable. With the joint efforts of the whole team, we can successfully complete the task every time.

video link: <https://drive.google.com/file/d/1d5CK4RWJlgX0zx7d_q0qhBmLUX9xJFcL/view?usp=sharing>