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Computer Science 321
Database Project
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CareerHack

Background

People who are interviewing for tech companies generally rely on Glassdoor to know what questions they could be asked. Glassdoor allows anonymous users to post their application experience. People what the interviews were like, the difficulty of the interviews, and any questions candidates have posted. While this is a great resource, there a few flaws. People cannot see what specific person at the company asked the question, and their role. Many times, the interview questions depend heavily on who is conducting the interview. Another flaw is that answers cannot be posted. Users are unable to and post their solutions to the questions. Our aim with this project was to solve this problem.

CareerHack is a resource for people who are interviewing in tech companies. This website allows job hunters to find what questions they could be asked when they are interviewing. They can not only see the questions that have been asked before but also see by what company they were asked by, what specific person asked them the question, the role of that person at the company, possible answers to the question they asked, and when the question was asked. They can figure out the question they might be asked selecting the company name, or topic, or job type.

Furthermore, CareerHack allows people to anonymously post questions they have been asked. They are asked to specify the necessary details but once all the required information is filled in, it becomes part of the CareerHack database. The anonymity encourages users to questions without fear of prosecution.

Setup

All instructions to setup the website to run locally can be found in README file. The website can also be found at https://careerhack.herokuapp.com/

Database

A database was used because there is a great deal of information. It allows us to store a great deal of efficiently. Information from the database can be retrieved quickly, and easily. If new data needs to be added, or old data needs to be deleted, that is also done quickly. Our database also allows more than one person needs to access the database at the same time. These benefits, along with numerous others makes it ideal for CareerHack to use a database.

We elected to use a PostgreSQL database primarily because of the compatibility/ease of setup on Heroku. All native Heroku database instances (ones which run on the same dyno/server as the application) automatically default to PostgreSQL. This, coupled with our previous familiarity with PostgreSQL, and some added benefits like shortcut commands (e.g. "\dt;" to list all tables) made it an ideal choice.

To create this database tables, we used PostgreSQL commands entered in terminal in a Unix environment. We created all 6 tables with Companies, Interviewers, Questions, Answers, JobTypes, Questions, and Topics. One such example can be seen below.

```
CREATE TABLE ANSWERS(
        ANSWERID            SERIAL PRIMARY KEY              NOT NULL,
        ANSWER              TEXT                        NOT NULL,
        QUESTIONID    INT                   references QUESTIONS(QUESTIONID)
                                                                    NOT NULL,
        CREATED             TIMESTAMP                       DEFAULT NOW(),
        UPDATED             TIMESTAMP                       DEFAULT NOW()
);
```

It can be seen the primary key is set to be the AnswerID. Furthermore, the AnswerID will be auto incremented upon each new entry, starting with zero. In addition, some attributes are not allowed to be null, such as Answer, QuestionID. The timestamps for the columns Created and Updated will default to when the entry is inserted. All of these create Table commands can be found in the PostgreSQL_Commands.txt file.

To insert data, commands were again entered through terminal. For example, a insert command for the Answers table is found below.

```
INSERT INTO ANSWERS(ANSWER, QUESTIONID)
VALUES
('A circular manhole prevents one from falling into the hole', 7);
```

In this command, the AnswerID does not need to specified since it is going to auto increment due to the SERIAL constraint given during the creation of the table. Furthermore, the Created or Updated values do not need to be give because they will be the time at which the data was inserted. All of these INSERT commands can be found in the PostgreSQL_Commands.txt file.

In order to retrieve data to fill the website page, commands tested through terminal and then placed in the app.py file to be run when the user clicked a link. For example, the following command was used to find the interview questions and answers at a company.

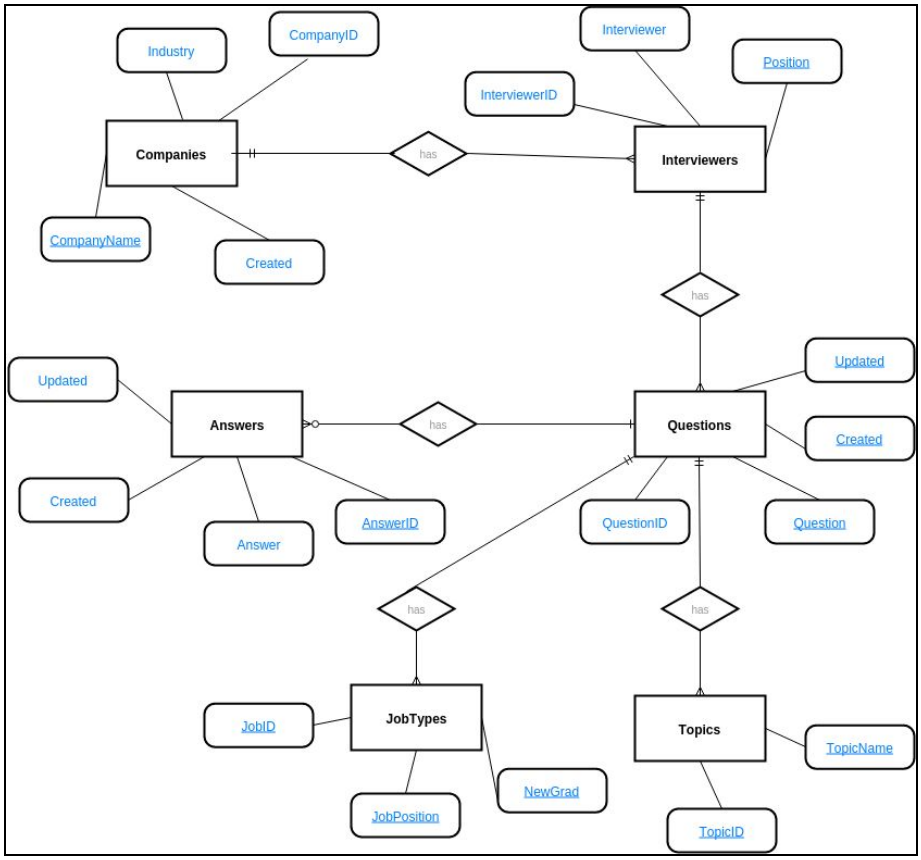
```
'SELECT * FROM "COMPANIES" INNER JOIN (
        SELECT * FROM "INTERVIEWERS" INNER JOIN (
                SELECT * FROM "QUESTIONS" LEFT OUTER JOIN (
                        SELECT * FROM "ANSWERS")
                AS JOINC USING ("QUESTIONID")) AS JOINB USING ("INTERVIEWERID"))
        AS JOINA USING ("COMPANYID") WHERE "NAME"=\'%S\';' % COMPANY_NAME
```

The '\%S\ is where the name of the company the user selected would go. This query uses inner join and left outer joins to gather all the necessary information about a company, and the interview questions they ask, as well as who asked them. If there is an answer in the database, the query will return it. If not, then it will be blank. Both of this is possible because of the left outer join of question with answers.

ER Diagram

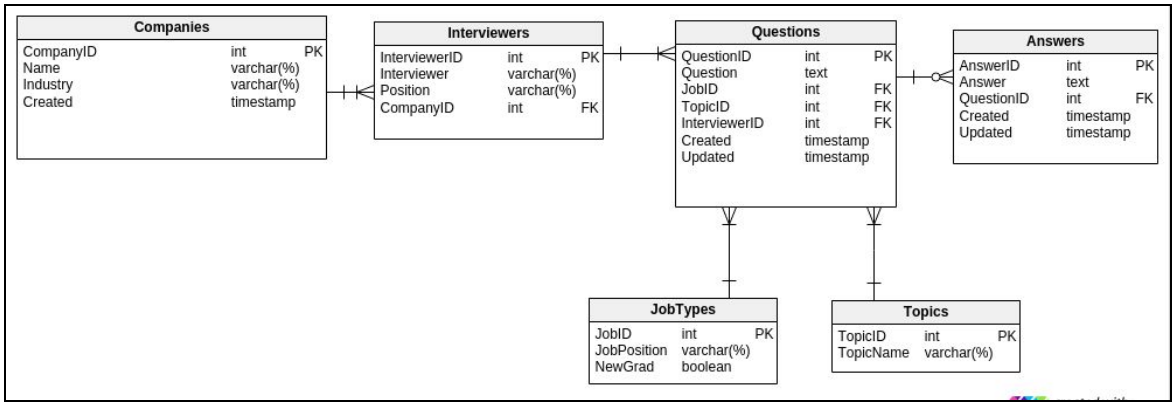
The ER diagram of the database below shows the relationships between Companies, Interviewers, Questions, Answers, JobTypes, and Topics. These relationships required that some inferences be made about.

- A company will have 1 interviewer or more.
- An interviewer, if in the database, will belong to 1 company.
- An interview will ask 1 or more questions.
- A questions belongs to 1 interviewer.
- A question may have 0 or many answers.
- A answer will have 1 question.
- A question will have 1 job type, and 1 topic
- A job type or topic may belong to 1 or multiple questions.



Database Schema

The ER diagram was then converted to a database schema seen below.



Access

This website will be open to all users. Any person who is browing the Internet can simply go to careerhack.herokuapp.com to see CareerHack. It is meant for anyone who is looking for a job at tech companies but works for internships as well. When a user clicks the companies present on the website, they will also be given the option to add questions to the database. They will need to specify the necessary information, but once they do, it will be added to the database.

Division of Work

This project allowed both of us to a great deal. We learned how to design a database, implement it, and make queries to the database. Grant was responsible for creating the website with Flask, and setting up PostgreSQL to interface with Flask. Gaurav was responsible for designing the database, and determining the necessary queries for the website.