Database Systems Project Proposal
Online Coding Platform

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Project Group No: 9
Ahmed Salih Cezayir - 21802918
Ezgi Lena Sönmez - 21703799
İsmail Sergen Göçmen - 21903707
Şule Nur Yılmaz - 21802031
Course Teacher: Çağrı Toraman - Course TA: Mustafa Can Çavdar

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1. Introduction

The report represents our Online Coding Platform proposal. The project aim, functionalities, constraints, limitations, the reason and logic behind database usage E-R diagram of database are given below related sections.

Our online coding platform's properties are explained in the project description chapter. This chapter also includes the reason and logic behind the database that will be created for the project.

Functional and non-functional requirements are given under the requirements chapter. Functional requirements represent the system's promises and are determined by user input analysis. Non-functional requirements represent the things that need to be done to fulfill these promises. These are related to back-end requirements.

System boundaries are examined in the limitations chapter. An E-R diagram created to represent the database system behind the system and given under the related section.

2. Project Description

This project aims to create a platform for companies to interview and sponsor coding contests while job seekers can practice with coding challenges and participate in coding contests. The project will be implemented with SQL standard language.

Database will be available for several user types and these are described as follows: Editors, companies and job seekers. Editors can prepare both coding challenges, coding contests and non-coding questions. Companies can prepare coding challenges, interview with job seekers and sponsor coding contests. Companies can also publish information about themselves such as what they do, where their buildings are etc. Job seekers can practice with coding challenges and participate in coding contests. They can also interview with companies and prepare a profile so companies can see them. Each of the users are required to login to the system in order to access the functionalities described above.

Contests will be another important part of our platform. As mentioned before, companies can sponsor contests. In these contests, participants will try to solve coding challenges in a particular time. There will be a leaderboard determined according to how much total points participants get from challenges.

Interviews can be created with a combination of code challenges and non-coding questions. Users can not see or enter interviews unless they are invited. By doing this, companies have more control over their interviewee list. Companies can see interviewee’s results and answers.

3. Why do we use the database?

An online coding platform, like other online applications, needs to store lots of data. For instance users, contests, challenges, question statistics etc. should be stored in some place. Also when these data are needed, fetching/querying them should be efficient and fast. To store these data, we can use either a database or a file system. A file system is not a reliable/scalable solution for an online system, because of concurrency and inconsistency issues. On the other hand, by using a database, we can structure the data and control them easier. Thus, using a database for data management is a good idea.

4. How do we use a database in our project ?

Nearly every functionality depends on the database in our project. All job seekers, editors, and companies should be kept in a database with their names, display names, emails, telephone numbers. After the authentication, the website offers different functionalities depending on the account type. Challenges and non-coding questions will be stored to create contests and interviews. Finished contests and interviews will be saved with their leaderboards. Plus, all non-coding questions’ answers of interviewees should be stored. Changes and reviews can be done with the help of queries.

5. Requirements

5.1 Functional requirements

5.1.1 Challenges

In our application, editors can create challenges, which generally consist of one question. They can edit or delete these challenges if needed. Editors can also see the statistics related to the challenges they created. Challenges do not have a leaderboard, however, each user can see the best time for the current question if they want to see. Each challenge has a dedicated forum/comment page, so other users can share the code they wrote or their thoughts about the current challenge. If users like the challenge they worked on, they can add it to their favorite challenges list. This list can be accessed

5.1.2 Non-Coding Questions

Editors and companies can create non-coding questions. Different from challenges, these questions will not have leaderboard, rate or forum/comment page. These questions are mostly personal information. Non-coding questions will be combined with challenges to create interviews. They can be given any part in the interview.

5.1.3 Contests

Contests consist of multiple challenges and they can be created by either an editor or a company. If the contest is created by an editor, companies can request to be a sponsor for the contest. Every contest has a leaderboard which can be seen by everyone. Users can see their ranking on this list. Like challenges, contests can also be edited or deleted by their creator. Users can also create teams if teams are allowed.

5.1.4 Login/Signup

Users can enter the website with their emails and passwords in the login screen. There is a register option for people who don’t have an account. In the register screen, users will select their account type and give information about themselves such as their name(or company name), display name, email, telephone and password.

5.1.5 Interviews

Users will contact companies from outside. They will be invited to interviews by companies through emails. Uninvited users can not see ongoing interviews on the website. There won’t be any interview related UI for normal users. Companies can see the leaderboard of coding questions and non-coding questions’ answers for all entered users.

5.2 Non-functional requirements

5.2.1 User-Friendly Interface

The user interface is one of the most important aspects of our program. Since time is important in contests and interviews, normal users should be able to reach them again easily if they quit from the website. Companies will not want to spend much time controlling their interview process, so the interface should be straightforward. For user satisfaction, the interface will be created considering the needs of the users.

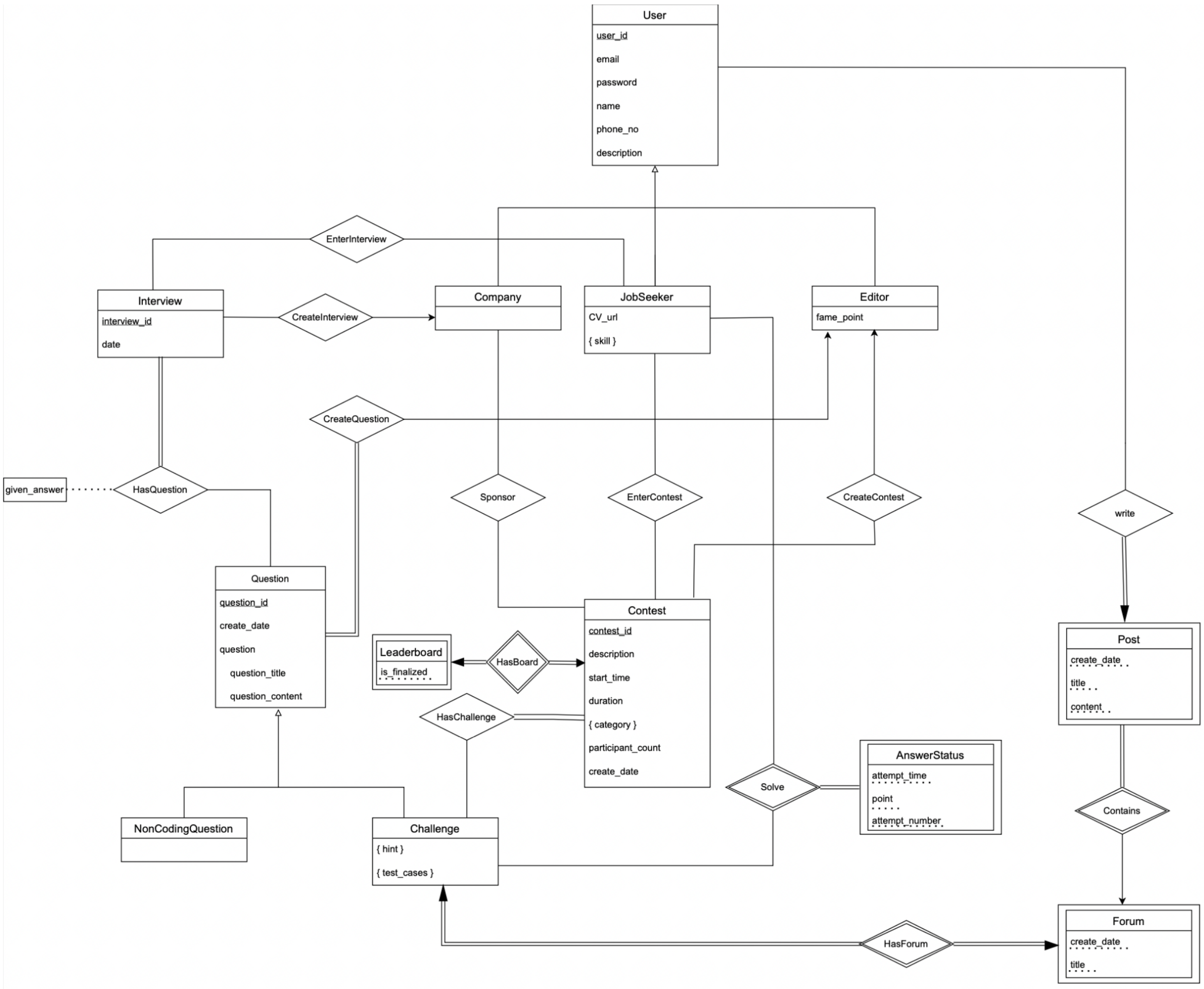
5.2.2 Maintainability

Since the project will be made using the Object Oriented approach, maintainability of the application will be easier. Adding new features, finding bugs and eliminating them will not be hard. Since many of our codes and functionalities are separated, our classes will be loosely coupled which will help us in maintainability.

5.3 Limitations

- Only editors can give hints
- Only companies can create interviews
- Companies can not withdraw their sponsorship
- Users can only enter one interview at a time
- Users can take 3 hints at most
- Users can not create contests or challenges
- Users can not exceed given time limit for contests and interviews
- All users need to be logged in to be able to access the site.

6. Entity Relationship Diagram



7. References

[1] “Flowchart Maker & Online Diagram Software”, *Draw.io*. [Online]. Available: https://app.diagrams.net/. [Accessed: 27-Feb-2022].

8. Website

Information and updates about the project can be found at the following link: