CSE 560 - Data Models and Query Language
Semester Project
Milestone - 1

Project details: Online Job Matching Portal

Team Name: Asymptotically Optimized

Team Members:

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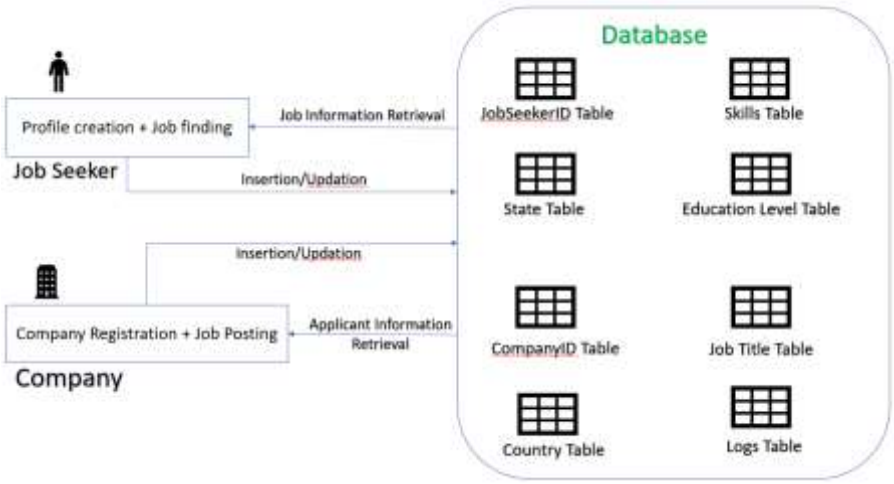
Problem Statement:



We aim to develop a robust database for online job matching portal. The proposed database will solve the needs of online job portal and serve as the data warehouse for online webapp. The proposed database design will be normalized. The normalization will help in smooth inserting of new records, updating of existing values and deletion of tuples without much hassle and in an optimized way. The database will contain information about both job applicants and companies.

The proposed database will be used by Database Administrator and webapp developers. The Database will be administered by DBA, also in addition to this, we will also design various data integrity check scripts along with various constraints to get a robust Database. Scripts will also be designed to grant access to users via roles.

Need of database:

A Database is required for the Online Job Matching portal as:

1) It will serve the data needs of webapp development team which an Excel file can't
2) It will help the DBA to give required roles or revoke roles to various attributes in data
3) The data will be large in volume and will have to be ingested in normalized table schemas which is not possible in Excel without complex computations
4) It will highly available across the company i.e. users from different departments can access the database to derive insights from latest data available which might not be possible in Excel as the data present might not be latest between various versions of excel files.

Target Users:

The proposed database can be used by Data Engineering, Business Intelligence, Compliance and Development Teams to satisfy their data requirements based on their specific use cases. For Example: Business Intelligence Teams could use the data in Database to derive insights on applicants and company, the webapp developers would need to use various tables to match the eligible job applicant to the right job listed etc.

List of relations and their attributes:

In total we aim to create 13 relations which help serve various data needs of the Online Job Matching Portal, Business Insights teams and Database Administrator.

The proposed relations along with their corresponding attributes is as given below:

1) **Company Relation:**
   This table would contain information for a Company registered on Job Portal. The list of attributes is as given below:
   a. CompanyID *(Primary Key)*: A unique id assigned to each company
   b. CompanyName: Name of Company
   c. CompanyEmail: Email associated with company account
   d. StateID *(Foreign Key)*: unique state ID
   e. CountryID *(Foreign Key)*: Country ID

2) **Applicant Relation:**
   This table would contain Applicant's information who registered on the Job Portal. The list of attributes is as given below:
   a. ApplicantID *(Primary Key)*: Unique ID for each applicant
   b. ApplicantEmail: Email Address of applicant
   c. EducationID *(Foreign Key)*: Education Level ID
   d. Age *(Constraint Must be More than 18)*: Applicant Age
   e. GenderID*(Foreign Key)*: Applicant Gender ID
   f. RaceID*(Foreign Key)*: Applicant Race ID
   g. WorkAuthorization (Type: Bool): Applicant allowed to work or not
   h. StateID *(Foreign Key)*: Applicant Location State ID
   i. CountryID *(Foreign Key)*: Applicant Location Country ID
   j. JobStateID *(Foreign Key)*: Applicant Desired State ID

k. JobCountryID *(Foreign Key)*: Applicant Desired Country ID
l. ExpectedSalaryID *(Foreign Key)*: Applicant Desired Salary ID

3) <u>Jobs Relation</u>:

This table contains the information of Jobs posted on Job Portal. The list of attributes is as given below:

a. JobID *(Primary Key)*: Posted job unique ID
b. JobTitle: Title of Job Posted on the portal
c. CompanyID *(Foreign Key)*: Company ID of Job Poster
d. SalaryID *(Foreign Key)*: Salary ID of Job posted
e. JobStateID *(Foreign Key)*: Job Location State ID
f. JobCountryID *(Foreign Key)*: Job Location Country ID
g. JobDescription: Description about the Role
h. ExperienceTypeID *(Foreign Key)*: Experience required for the posted Job

4) <u>Skills Relation</u>:

This Relation contains the mapping of skills to JobPosting. The List of attributes is as given below:

a. SkillID *(Primary Key)*: Contains the Unique ID given to each skill
b. SkillName : Name of the Skill

5) <u>JobSkill_mapping</u>:

This relation contains mapping of skills to a Job posting. This table can help us get the skills required for a job posted on Portal. The List of attributes is as given below:

a. JobID *(Foreign key)*: Job ID of Job Posted
b. SkillID *(Foreign key)*: Skill ID of Job Posted

6) <u>Country Relation</u>:

This relation contains the information about Country. The attributes are as given below:

a. CountryID *(Primary Key)*: Unique ID assigned to each country
b. CountryName: Name of Country

7) <u>State Relation</u>:

This relation gives us the State Information along with mapping of CountryID. The Attributes are as given below:

a. CountryID (*Foreign Key*): Country ID of State
b. StateID (*Primary Key*): Unique ID for a state
c. StateName: Contains State Name

8) <u>Salary</u>:

This relation gives us the salary brackets information. The attributes are as given below:

a. SalaryID *(Primary Key)*: Unique key to each salary bracket
b. SalaryGroup: Contains the Salary range of current group
c. SalaryLower: Contains the lower bound of current salary group
d. SalaryUpper: Contains the upper bound of current salary group

9) <u>Passwords</u>:

This relation will serve the needs of authentication of Users/Company and will have **restricted access** to DBA only. The attributes are as given below:

a. ID: ApplicantID or CompanyID based on Company_Flag
b. EmailID: Email ID of company or applicant based on company_flag
c. Company_Flag: Bool value (True for Company and False for Applicant)
d. Secret_key: Password of account

10) Gender:

This relation contains the gender for job applicants. The attributes are given below:

a. GenderID *(Primary Key)*: Unique ID for the Gender
b. GenderName: Gender of the applicant

11) Race:

This Relation contains the race for the job applicants. The attributes are given below:

a. RaceID *(Primary Key)*: Unique ID for the Race
b. RaceName: Race of the applicant

12) Education:

This relation contains the education level information for job applicants. The attributes are as given below:

a. EducationID *(Primary Key)*: Unique ID for each education Level
b. EducationLevel: Education level for job applicant

13) Experience:

This relation contains the experience of job applicants. The attributes are as given below:

a. ExperienceID (*Primary Key*): Unique Experience ID for each Experience band
b. ExperienceName: Experience of job applicant

E/R Diagram: