Database Design

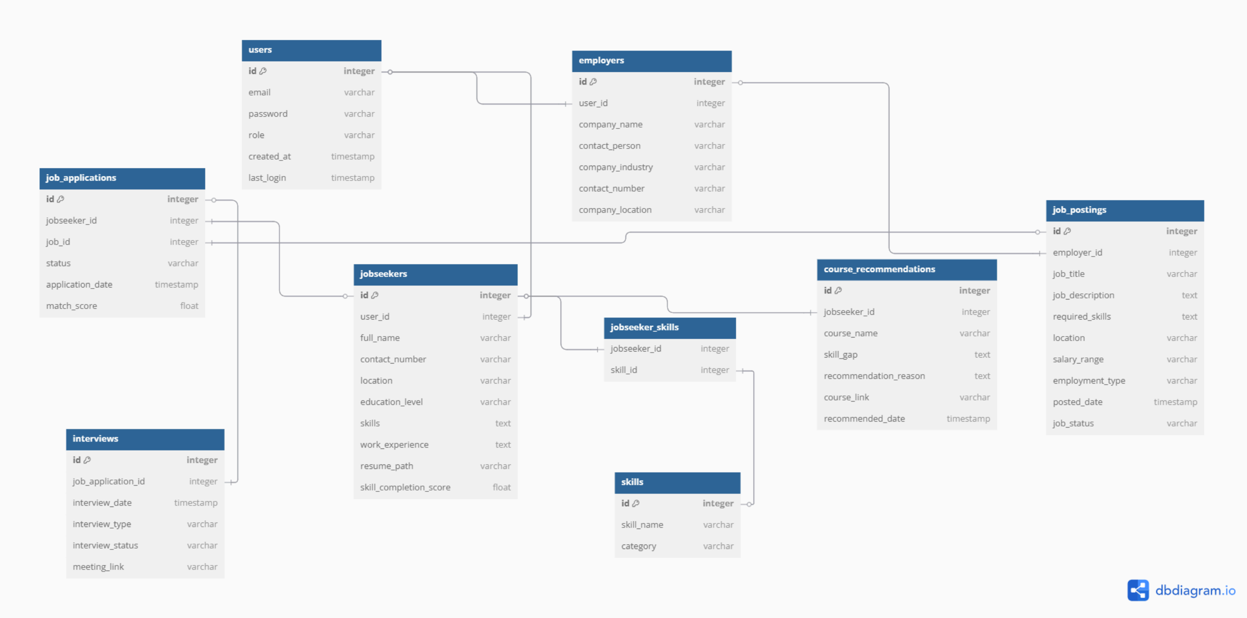
We decided to create the database with **MySql** as there are quite a few easy-to-use plug-and-play open-sourced tools out there that help with the development.

This is the draft of the schema, and we believe that as the project goes on, there will be more table that may be added for the project.

For the ERD diagram we use a tool called dbdiagram.io. This tools allows us to generate the ERD diagram based on the database schema.

Reference : https://dbdiagram.io/

```
-- Users Table
CREATE TABLE Users (
   user_id INT AUTO_INCREMENT PRIMARY KEY,
   email VARCHAR(255) NOT NULL UNIQUE,
   password VARCHAR(255) NOT NULL,
   role ENUM('JOBSEEKER', 'EMPLOYER', 'ADMIN') NOT NULL,
   created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
   last_login TIMESTAMP NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Jobseekers Table
CREATE TABLE Jobseekers (
   jobseeker_id INT AUTO_INCREMENT PRIMARY KEY,
   user_id INT UNIQUE,
   full_name VARCHAR(255) NOT NULL,
   contact_number VARCHAR(20),
   location VARCHAR(255),
   education_level VARCHAR(100),
   skills TEXT,
   work_experience TEXT,
   resume_path VARCHAR(500),
   skill_completion_score FLOAT,
   FOREIGN KEY (user_id) REFERENCES Users(user_id) ON DELETE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Employers Table
CREATE TABLE Employers (
   employer_id INT AUTO_INCREMENT PRIMARY KEY,
   user_id INT UNIQUE,
   company_name VARCHAR(255) NOT NULL,
   contact_person VARCHAR(255),
   company_industry VARCHAR(255),
   contact_number VARCHAR(20),
   company_location VARCHAR(255),
   FOREIGN KEY (user_id) REFERENCES Users(user_id) ON DELETE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Job Postings Table
CREATE TABLE JobPostings (
   job_id INT AUTO_INCREMENT PRIMARY KEY,
   employer_id INT,
   job_title VARCHAR(255) NOT NULL,
   job_description TEXT NOT NULL,
   required_skills TEXT,
   location VARCHAR(255),
   salary_range VARCHAR(100),
   employment_type ENUM('FULL_TIME', 'PART_TIME', 'CONTRACT', 'FREELANC
   posted_date TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
   job_status ENUM('OPEN', 'CLOSED', 'IN_REVIEW'),
   FOREIGN KEY (employer_id) REFERENCES Employers(employer_id) ON DELET
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Job Applications Table
CREATE TABLE JobApplications (
   application_id INT AUTO_INCREMENT PRIMARY KEY,
   jobseeker_id INT,
   job_id INT,
   status ENUM('APPLIED', 'SCREENING', 'INTERVIEW', 'OFFER', 'REJECTED'),
   application_date TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
   match_score FLOAT,
   FOREIGN KEY (jobseeker_id) REFERENCES Jobseekers(jobseeker_id) ON DEL
   FOREIGN KEY (job_id) REFERENCES JobPostings(job_id) ON DELETE CASCAD
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Skills Table
CREATE TABLE Skills (
   skill_id INT AUTO_INCREMENT PRIMARY KEY,
   skill_name VARCHAR(255) UNIQUE NOT NULL,
   category VARCHAR(100)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Jobseeker Skills (Many-to-Many Relationship)
CREATE TABLE JobseekerSkills (
   jobseeker_id INT,
   skill_id INT,
   PRIMARY KEY (jobseeker_id, skill_id),
   FOREIGN KEY (jobseeker_id) REFERENCES Jobseekers(jobseeker_id) ON DEL
   FOREIGN KEY (skill_id) REFERENCES Skills(skill_id) ON DELETE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Course Recommendations Table
CREATE TABLE CourseRecommendations (
   recommendation_id INT AUTO_INCREMENT PRIMARY KEY,
   jobseeker_id INT,
   course_name VARCHAR(255) NOT NULL,
   skill_gap TEXT,
   recommendation_reason TEXT,
   course_link VARCHAR(500),
   recommended_date TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
   FOREIGN KEY (jobseeker_id) REFERENCES Jobseekers(jobseeker_id) ON DEL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Interviews Table
CREATE TABLE Interviews (
   interview_id INT AUTO_INCREMENT PRIMARY KEY,
   job_application_id INT,
   interview_date TIMESTAMP NOT NULL,
   interview_type ENUM('PHONE', 'VIDEO', 'IN_PERSON'),
   interview_status ENUM('SCHEDULED', 'COMPLETED', 'CANCELLED'),
   meeting_link VARCHAR(500),
   FOREIGN KEY (job_application_id) REFERENCES JobApplications(application_i
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

-- Indexes for Performance Optimization
CREATE INDEX idx_job_postings_employer ON JobPostings(employer_id);
CREATE INDEX idx_job_applications_jobseeker ON JobApplications(jobseeker_ic
CREATE INDEX idx_job_applications_job ON JobApplications(job_id);
CREATE INDEX idx_interviews_job_application ON Interviews(job_application_id)
```



users	
id	integer
email	varchar
password	varchar
role	varchar
created_at	timestamp
last_login	timestamp

employers	
id	integer
user_id	integer
company_name	varchar
contact_person	varchar
company_industry	varchar
contact_number	varchar
company_location	varchar

job_applications	
id	integer
jobseeker_id	integer
job_id	integer
status	varchar
application_date	timestamp
match_score	float

job_postings	
id	integer
employer_id	integer
job_title	varchar
job_description	text
required_skills	text
location	varchar
salary_range	varchar
employment_type	varchar
posted_date	timestamp
job_status	varchar

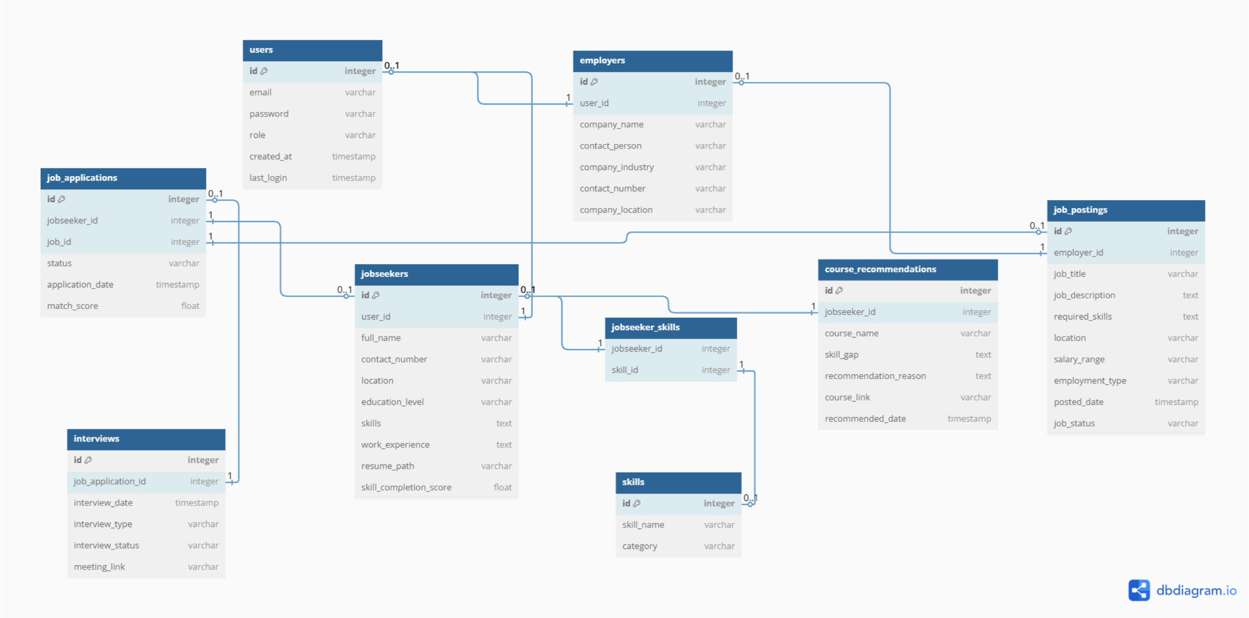
jobseekers	
id	integer
user_id	integer
full_name	varchar
contact_number	varchar
location	varchar
education_level	varchar
skills	text
work_experience	text
resume_path	varchar
skill_completion_score	float

course_recommendations	
id	integer
jobseeker_id	integer
course_name	varchar
skill_gap	text
recommendation_reason	text
course_link	varchar
recommended_date	timestamp

jobseeker_skills	
jobseeker_id	integer
skill_id	integer

interviews	
id	integer
job_application_id	integer
interview_date	timestamp
interview_type	varchar
interview_status	varchar
meeting_link	varchar

skills	
id	integer
skill_name	varchar
category	varchar



The second diagram highlights the relationships among the tables.

A little bit about each table and the Key Design Considerations:

1. Users Table
    - Central authentication table for all users
    - `role` ENUM limits user types to Jobseeker, Employer, or Admin
    - `created_at` tracks account creation
    - `last_login` monitors user activity
    - `email` is unique to prevent duplicate registrations
2. Jobseekers Table
    - Stores comprehensive professional profile information
    - `skills` and `work_experience` as TEXT for flexible storage
    - `resume_path` stores file location
    - Links to Users table via `user_id`
    - `skill_completion_score` enables AI-powered skill matching
3. Employers Table
    - Captures company and contact details

- Links to Users table
- Supports multiple company information fields

4. JobPostings Table
    - Detailed job listing information
    - ENUM for `employment_type` standardizes job types
    - `job_status` tracks posting state
    - Linked to Employers table
5. JobApplications Table
    - Tracks job application lifecycle
    - ENUM `status` reflects application progression
    - `match_score` enables AI-powered candidate matching
6. Skills Table
    - Centralized skills repository
    - `category` allows skill classification
7. Jobseeker Skills Table
    - Enables many-to-many relationships between Jobseekers and Skills
    - Allows multiple skills per job seeker
8. Course Recommendations Table
    - Stores AI-generated course suggestions
    - Linked to specific job seekers
    - Captures skill gaps and recommendation details
9. Interviews Table
    - Manages interview scheduling and tracking
    - ENUM for `interview_type` and `interview_status`
    - Stores meeting links

Performance and Security Enhancements:

- InnoDB engine for transactional support
- UTF-8 character set for international support
- Cascade delete for maintaining referential integrity
- Indexes on frequently queried columns

References : https://www.geeksforgeeks.org/database-design-in-dbms/