EMU415 DBMS Term Project

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Objective

The EMU Hacettepe Personal Development Platform is a platform aimed at increasing knowledge exchange among students and graduates of the Industrial Engineering Department at Hacettepe University. It aims to enhance students' skills by sharing information on which industries our graduates work in, and how they acquire the necessary knowledge in these sectors.

Features

- **Graduate Sector Insights:** A feature allowing graduates to share their industry experiences, including sectors they work in, knowledge acquisition methods, and career development tips. Skill and Knowledge

- **Gap Identification:** Tools to help students identify areas for improvement by comparing their current skills and knowledge with those of graduates in various industries.

- **Resource Sharing Platform:** A platform for sharing industry-specific resources such as articles, webinars, and online courses (Udemy, Coursera etc.) to enhance students' skills and knowledge.

Relations and Their Attributes as an Initial Design

1. **users**

   - user_id (Primary Key)
   - first_name
   - last_name
   - email
   - role (e.g., Student, Researcher, Graduate)
   - join_date
   - graudation_date
   - erasmus_id (Foreign Key)
   - master_id (Foreign Key)
   - job_id (Foreign Key)
   - grad_project_id (Foreign Key)
   - skill_id (Foreign Key)
   - linkedin

2. **jobs**

   - job_id (Primary Key)
   - position_title
   - company_id (Foreign Key)
   - location
   - starting_date

3. **erasmus**

   - erasmus_id (Primary Key)
   - institution_name
   - country
   - department

4. **master**

   - master_id (Primary Key)
   - institution_name
   - department
   - city

5. **graduation_projects**

  - grad_project_id (Primary Key)
  - title
  - company_id (Foreign Key)

6. **companies**

  - company_id (Primary Key)
  - company_name
  - founding_year
  - employee_number

7. **skills**

  - skill_id (Primary Key)
  - skill_name

8. **bsc_school**

  - school_id (Primary Key)
  - school_name
  - department
  - city

Relations

1. **Users**:

  - **One-to-One**: Each user may have only one Erasmus ID, Master ID, Job ID, Graduation Project ID, and LinkedIn profile.

  - **Many-to-One**: Many users can have the same role (e.g., Student, Researcher, Graduate).

2. **Jobs**:

  - **Many-to-One**: Many jobs can belong to the same company.

3. **Erasmus**:

  - **One-to-Many**: Each institution can have multiple students (users).

4. **Master**:

  - **One-to-Many**: Each institution can have multiple students (users).

5. **Graduation Projects**:

   - **Many-to-One**: Many graduation projects can belong to the same company.
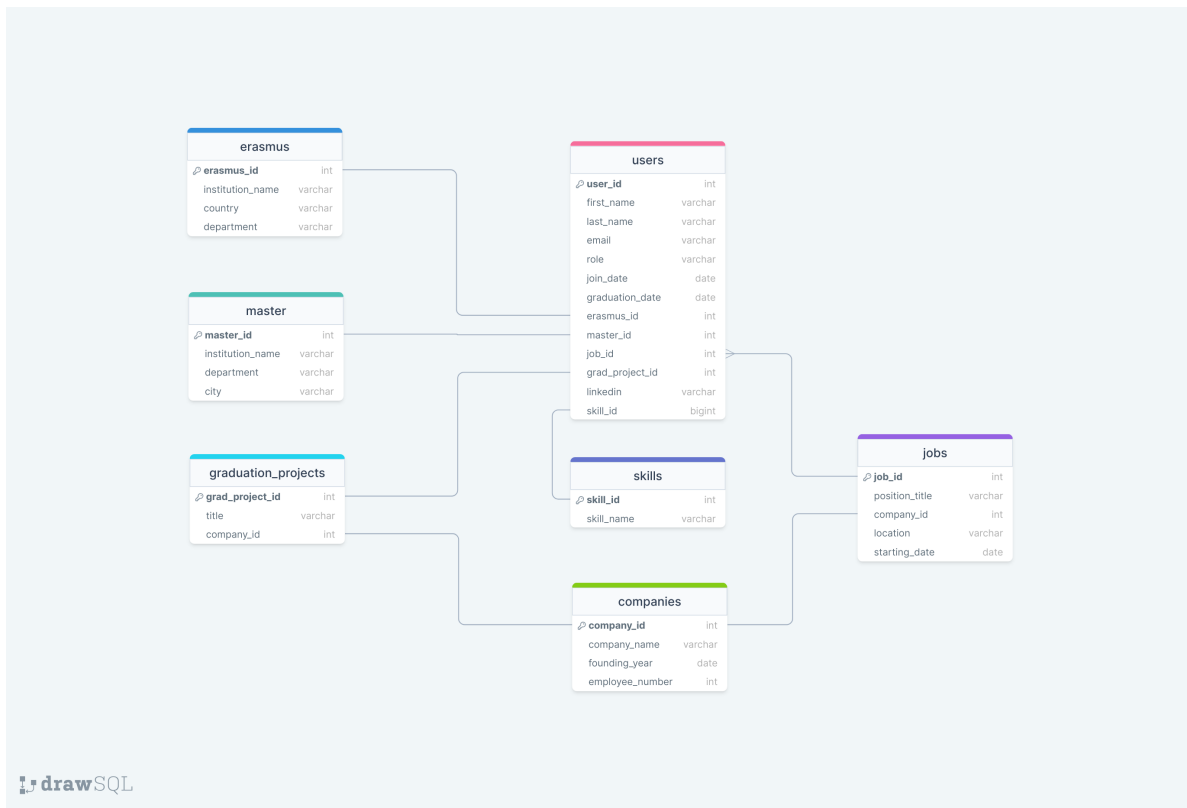   - **One-to-Many**: Each graduation project requires multiple skills.

6. **Companies**:

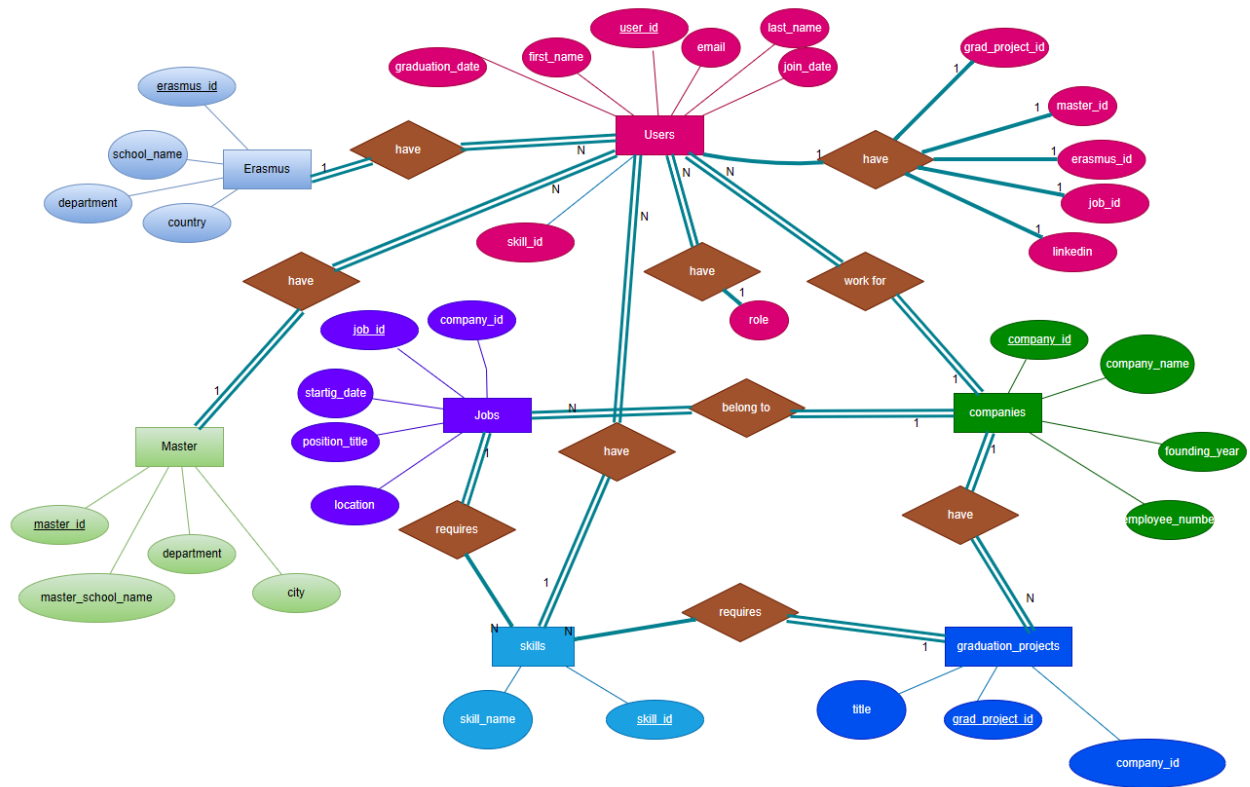   - **One-to-Many**: Many users can work for the same company.

7. **Skills**:

   - **Many-to-One**: Many users can have the same skill.

Database Schema

Entity-Relationship Diagram

Implementation

Here are some examples of creation of tables, inserting into tables, updating and dropping columns;

```sql
CREATE TABLE skills (
    skill_id INT NOT NULL AUTO_INCREMENT,
    skill_name VARCHAR(128),
    experience_years INT UNSIGNED,
    PRIMARY KEY(skill_id));

CREATE TABLE companies (
    company_id INT NOT NULL AUTO_INCREMENT,
    company_name VARCHAR(128),
    founding_year VARCHAR(128),
    employee_number INT,
    PRIMARY KEY (company_id)
);

INSERT INTO erasmus (instution_name, country, department) VALUES
 ('University of Oslo', 'Norway', 'Computer Science'),
 ('University of Barcelona', 'Spain', 'Economics'),
 ('Humboldt University', 'Germany', 'Linguistics'),
 ('University of Bologna', 'Italy', 'History'),
 ('University of Amsterdam', 'Netherlands', 'Psychology');


-- Master Tablosuna örnek veriler ekleme
INSERT INTO masters (instution_name, department, city) VALUES
 ('Stanford University', 'Computer Science', 'Stanford'),
 ('Harvard University', 'Business', 'Boston'),
 ('Oxford University', 'Law', 'Oxford'),
 ('ETH Zurich', 'Engineering', 'Zurich'),
 ('Sorbonne University', 'Literature', 'Paris');


UPDATE companies SET company_name = "ICRON" WHERE company_id = 6;
UPDATE companies SET company_name = "TESLA" WHERE company_id = 7;
UPDATE companies SET company_name = "LUFTHANSA" WHERE company_id = 8;
UPDATE companies SET company_name = "MSC" WHERE company_id = 9;
UPDATE companies SET company_name = "MARTI" WHERE company_id = 10;


ALTER TABLE users DROP column join_date;
ALTER TABLE users DROP column graduation_date;
```

Query Results

This query retrieves information about users who work in companies established after 1900 and have more than 100,000 employees, including their first name, last name, company name, job start date, job end date, location, position title, and employee number:

```sql
SELECT first_name, last_name, company_name, job_start_date, job_end_date, location, position_title, employee_number
FROM companies JOIN jobs JOIN users ON companies.company_id = jobs.company_id
AND users.job_id = jobs.job_id WHERE founding_year > 1900 GROUP BY position_title
HAVING employee_number > 100000 ORDER BY employee_number;
```

first_name	last_name	company_name	job_start_date	job_end_date	location	position_title	employee_number
Michael	Johnson	BMW	2021-07-01	2024-02-24	Berlin	Data Scientist	133778
Sophia	Garcia	BMW	2022-07-01	2024-05-13	Tokyo	Product Manager	133778
John	Doe	Google	2021-07-01	2024-02-24	San Francisco	Software Engineer	150000
Emma	Smith	Amazon	2021-07-01	2024-02-24	New York	Marketing Manager	1300000

This query retrieves the first name, last name, school name, and department of users who have undergraduate education:

```sql
SELECT first_name, last_name, school_name, department FROM bsc_school JOIN users
    ON bsc_school.school_id = users.undergrad_school_id;
```

first_name	last_name	school_name	department
John	Doe	Politecnico Di Milano	Applied Sciences
Emma	Smith	Harvard University	International Relations
Michael	Johnson	Universidad de Alcala	Business Administration
Maria	Garcia	Stanford University	Informatics
David	Brown	Cambridge	Industrial Engineering
Alice	Johnson	Stanford University	Computer Science
Bob	Smith	Cambridge	Industrial Engineering
Eva	Martinez	Stanford University	Biology

Application of Project

After entering the necessary information for a graduate, the Curriculum Vitae Timeline will appear as follows:

Curriculum Vitae Timeline
John Doe

Academic
- MSc in Law — Oxford University
- BSc in Applied Sciences — Politecnico Di Milano

Extra
- Erasmus — University of Barcelona
- Graduation Project — Development of AI Chatbot

Work Experience
- Software Engineer — Google
- Internship — LUFTHANSA

2016 2018 2020 2022 2024