COMP2222 Database Systems
Spring 2021, Project Part#2
Due: May 09, 2021 23:50

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Part II. Implementation of the DB

Given the solution of Part I, steps:

- **a.** Implement the relational schema below on MySQL.
- **b.** Once the implementation is completed, populate every table with a reasonable number of tuples (at least 5 for tables representing entities and 10 for tables representing relationships).
- **c.** Write SQL queries retrieving the information specified below.

Deliverables: SQL statements. In particular, submit 3 txt files:

- "CREATE TABLE" queries for part (a),
- "INSERT INTO" queries for part (b), and,
- "SELECT FROM" queries for part (c).

Note: some of the queries below may need modification on given solution. So, first solve the problem, then write the code.

Queries (replace the variables C, E, J, etc. with a suitable **value** from the domain, for instance, if E represents an employee, then can be replaced with "emineekin" which is the user name of a registered employee):

1. Select the last names of unemployed end-users.
2. Select the count of HRRs that also have an end-user profile.
3. Select the company (or companies) that listed the highest paying job's posting.
4. Select the end-user that has been working at the same company for the longest period.
5. Select the first name and last name of the HRRs that posted a job listing for company C.
6. Select the number of end-users that applied to job listing J.
7. Select the number of applications by end-user E.
8. Select the username of the end-user(s) that has the maximum experience. Experience is measured by the duration of employment and does not include current employment.
9. Select the highest paying job listing.
10. For each end-user, list the number of applications to job listings. Order the result set by count in descending order.
11. Find the jobs those are suitable for an end user E, who is looking for a part-time job to work during the summer in Bodrum.
12. Find the highest paying manager job with department size<50 for an end user E.
13. List the open internships positions of a particular company C which allows more than 20 days.

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SOLUTION OF PART I

Assumptions:

- Military service status: Female end-users are simply exempted.
- End-user previous work experience: because the end date field cannot be NULL, current employment of an end user should be kept in a separate table.
- Job posting duration: two solutions are acceptable. Store [Post opening date and post duration] or store [post duration]. The advantage of using first solution is that, it allows the HRR to postpone the announcement of posting to a further date.
- Manager jobs: two solutions are available, depending on the number of manager position openings.
    a. Add three attributes [is manager job, department size, department name] into the job post posting. Note that, if manager job postings are rarely happening then all these fields will be NULL in many of the tuples.
    b. Add an attribute [is manager job] into job postings and add another entity ManagerJobPosting that inherits from job postings, and storing [department name, department size].
    c. Add a "Department" weak entity with [department name, department size] attributes, and "Has" identifying relationship to implement "company has departments". Add a new entity "manager jobs" that inherits from "job postings". Add a 1-1 "to manage" relationship between department and manager jobs.

  To keep the solution "simple", (b) has been preferred in solution.
  The requirement saying that managers jobs cannot be part time contracted cannot be shown in EER. Therefore, it needs to be implemented as a constraint in DDL.
- Internships: extend the [is manager job] attribute to varchar, and rename as [isManOrInternship] since obviously this becomes a disjoint inheritance. To make the inheritance sound, minimumNumberOfDays attribute has been added.
  Add all internship application requirements into regular Application relation. If the application is not for an internship position, all those attributes become null in Application table. It is also possible to store an InternshipApplication relation. (The choice depends on number of regular job postings vs. number of internships postings)
- Courses: in EER it is a multivalued attribute, but in relational schema must be stored in a separate table, CoursesForIntershipApps. It is an option to make JID, username, course triplet a compound primary key. However, to have a simpler primary key for such a multivalued attribute table, an autoincrement primary key has been added.

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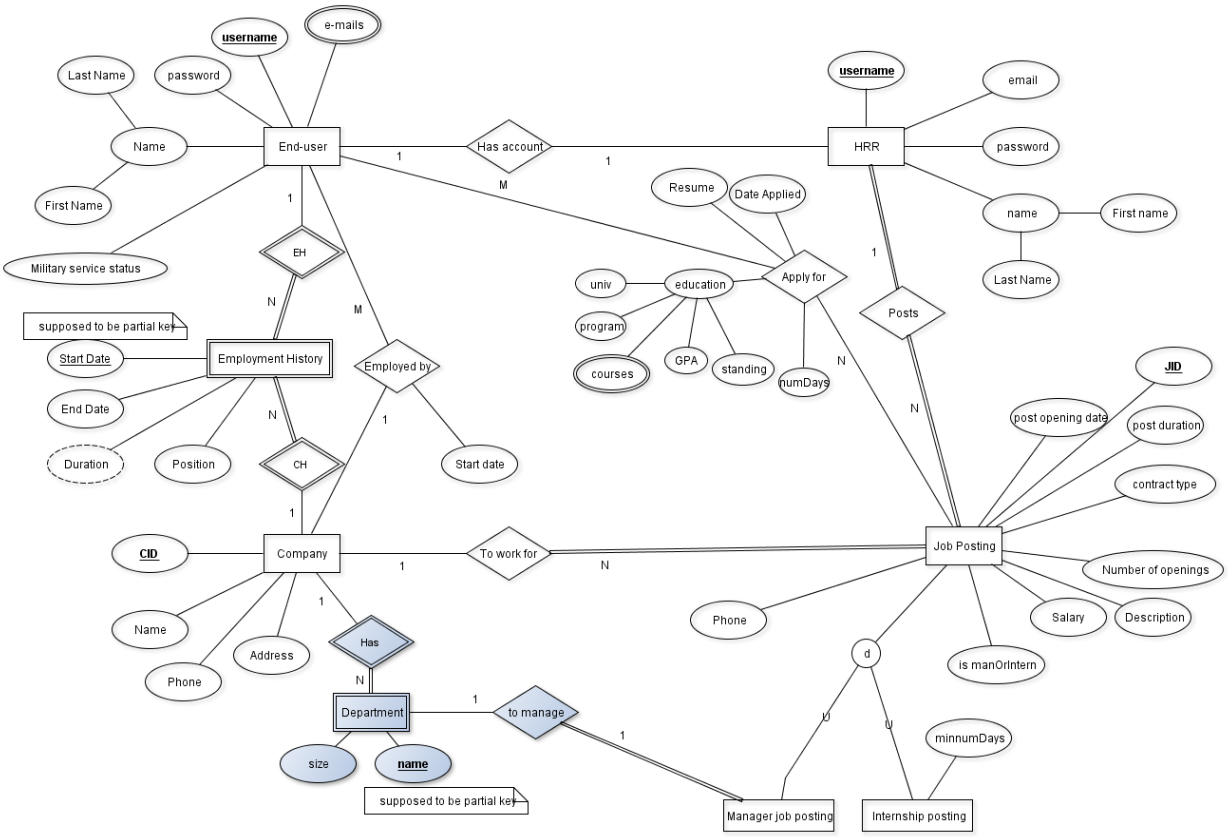

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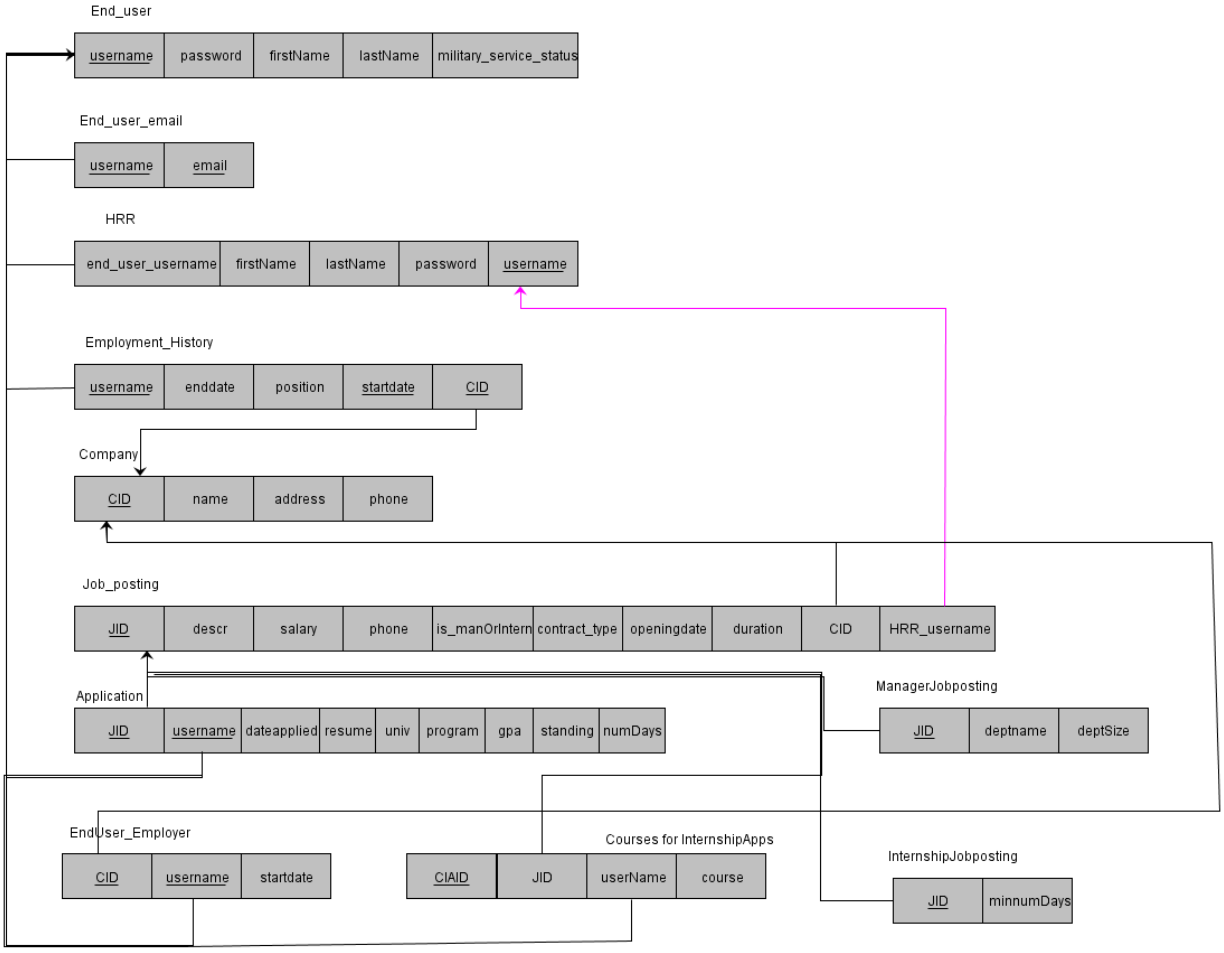

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