

95 – 703 B: Database Management

Homework #1 (hardcopy due on September 15, at the beginning of class)

Using the description of basic operating environment of a company named Homer Consulting Enterprises draw an ER diagram. Only some attributes are mentioned in the description. Identify the attributes provided as well as any other attributes that should be included in the model. Further, make sure that each entity has its key attribute(s) clearly represented in the diagram.

In the *Homer Consulting*, each employee is employed by one department. Within a single department there is a limit on the number of employees assigned to it. No more than 25 employees and no less than 5 employees are employed by a department. The attributes kept for each department are: department name, location, and phone.

One of the employees from a department manages the department. Some employees (especially in larger departments) supervise other employees in their department. Thus, one employee may have a supervisor and may also supervise other employees as well. The CEO supervises the top-level employee of each department. For each employee the company stores employee's name, DOB, hire date, title/position (e.g., programmer, analysts, research associate, etc.), and such like.

The company runs projects for external clients. There is no limit of the number of projects done for a single client but each project is done for a single client. The client information maintained by the *Homer Consulting* includes: name, address, contact person's name, phone, web address, and industry. Information on both current clients (those that have had projects done in the past) as well as potential clients (those who have not requested projects yet) is kept.

For billing purposes, each project is contained within one department. A department can operate/manage several projects, but each project is handled by a single department. Some departments (e.g., Administration or Marketing) do not manage projects at all. Information for each project includes project number, name, start date, and total cost (recorded only upon completion of a project).

Each project has several employees working on (assigned to) the project. To make the projects manageable there is a limit of the number of employees assigned to a single project. Each project has no more than 8 and no less than 4 employees assigned to it. To ensure productivity, an employee cannot be assigned to more than 4 projects at any time. The date that the employee was assigned to that project as well as the total number of hours spent by the employee on the project is important and must be recorded. Most (but not necessarily all) of employees assigned to a project come from one department. Newly hired employees are not assigned to any project for the first few months and may be trained internally or by attending formal workshops.

Homer Consulting maintains a list of desired skills (only 10 major skills are stored). For each desired skill, code, name, and category is kept. Not all of these skills might be represented among the employees. Whenever an employee acquires a skill, through some form of training (e.g. completing a course at a college, completing a technical training program, or a workshop) approved by the company, the date when it was acquired and a comment regarding the training is recorded. Each employee may take the same training more than once since some of the skills might need to be updated or renewed. Each employee should have at least 2 skills (from the desired skills) from the beginning of their employment. Each project requires one "major" skill.