**EECS 495—Fall 2017**
**Homework Assignment No. 1**
**Due: Monday, October 9, 2017**

Problem No. 1

Our task is to build a model of the web-based operations of EBids, Inc., which is an on-line auction house (not unlike EBay, which we'll assume you are familiar with. Go to www.ebay.com if you have no idea of what we're talking about). EBids is particularly interested in tracking and recording customer actions on their website. They will be building a database to help them do this, and to begin the design of the DB they have asked you to construct an ER model for the following system.

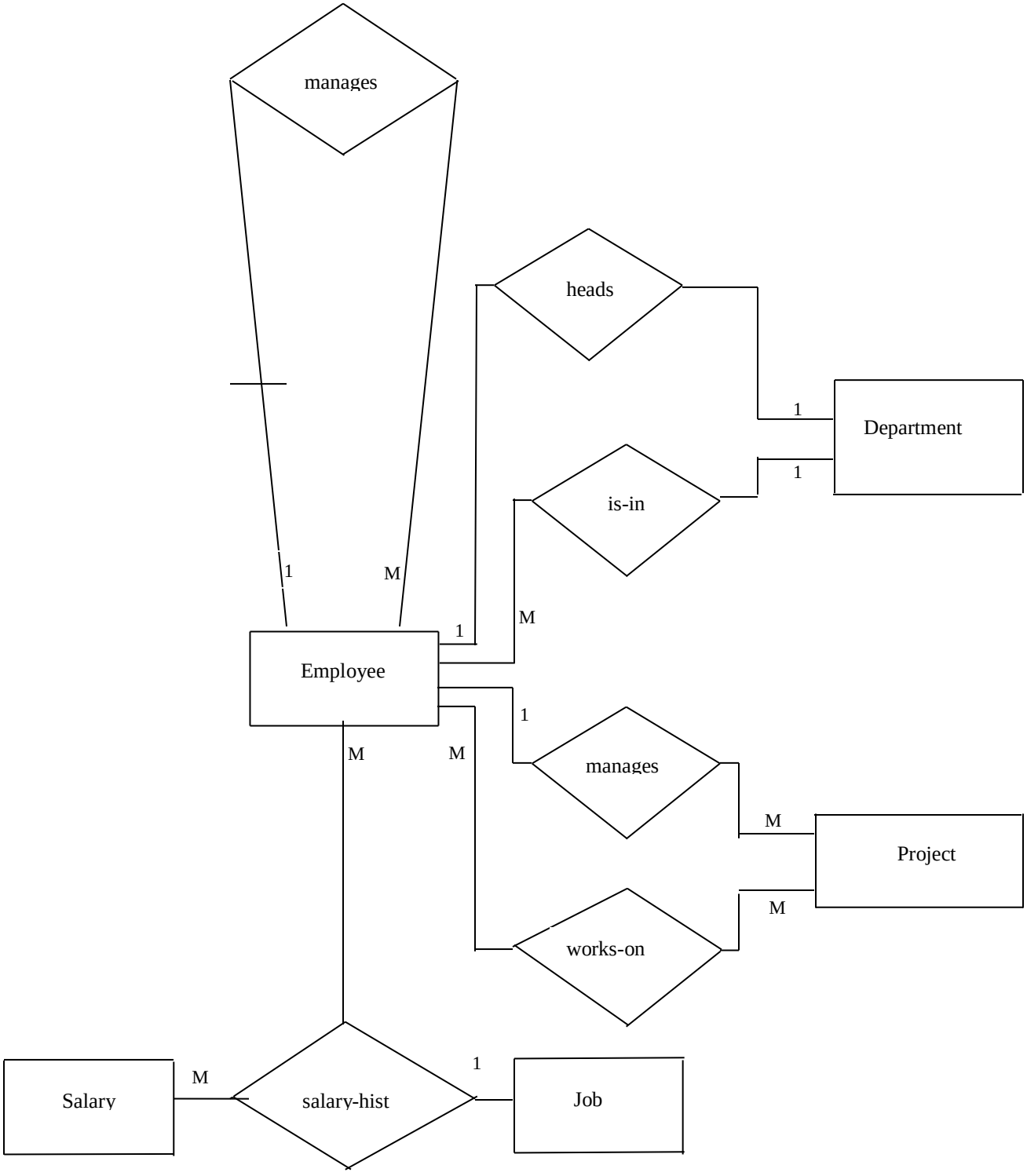
When a person uses the EBids website and views any of the pages on the website, EBids records the time and the IP address (i.e., the identity) of the computer that they are accessing EBids from, and then places a cookie on the user's computer, which is valid for the next 30 minutes. A cookie is simply a footprint with a unique identification number that a website can leave on a user's computer, and then look at later if it so desires. Note that many people can use the same computer to access the EBids site (for example, many students in a computer lab use the same machine or many people in a household can use the machine), so the IP address of a computer does not identify who is viewing the website. EBids realizes this, but makes the assumption that for the 30-minute life of a cookie, the same person is browsing their website from that computer, and that it has not changed users. When it places the cookie, it also records their browser type and whether or not the browser is Java enabled.

Once the cookie is set, EBids proceeds to track their actions on the site during the life of the cookie. Visitors can view EBids website pages (uniquely identified by their URL); when they do, EBids records the time that the page was viewed at. Each EBids web page has HTML code, as well as a set of advertisements that can be shown on that page. When the user actually visits a page, one or more of those ads are shown to the user. A page can also display one or more items that are currently up for auction. Items up for auction have a minimum price, a shipping price, the shipping method, a description, a category, a name, a time put up for auction, a time at which the auction is to end, and a unique item ID#.

To bid on or sell an item on the EBids website, a user must first register. EBids knows the following information about all registered users: e-mail address, user ID, password, name (first, last, middle initial), and address. One a user has registered, by looking at the cookie on the user's machine, EBids can figure out where they have been thus far while browsing the EBids website (at least, where they have been since the cookie was first placed on their machine).

A registered user can be a seller, in which case they have a "buyer satisfaction rating" that records how happy people were with items purchased from them. A registered user can also be a buyer. Buyers bid for items up for auction. Also recorded is the number of auctions won by a buyer. The way that an auction works (from the buyer's perspective) is as follows. The buyer is first asked for the number, type, and expiration date of the credit card that they will use to pay for the item if they win the auction. They only enter in this information once, before their first bid for the item. They can bid on different items with different credit cards, but the same credit card is used by a buyer for an entire auction. Then, they enter in one or more bids on the item. For each bid, the time and dollar amount of the bid is recorded.

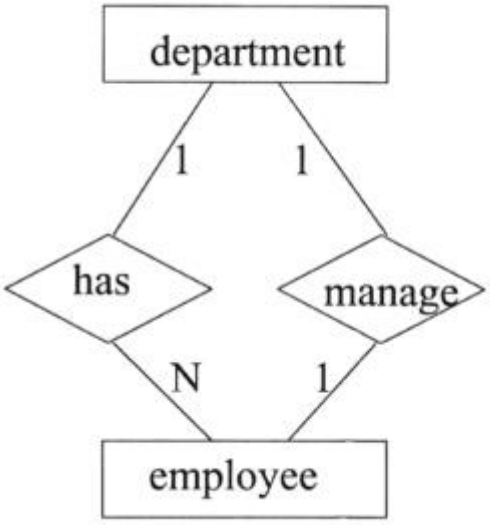
**Problem No. 2:** Given the following ER diagram, define the appropriate SQL Tables.




Following are the known attributes for the corresponding entity sets:

| | |
|---|---|
| Department: | Dept_no, Dept_name, Dept_head; |
| Employee: | Emp_no, Emp_name, Room_no; |
| Salary: | Salary_level, Mon_Salary; |
| Job: | Job_code, Job_title; |
| Project: | Proj_code, Proj_name, Start_date, End_date; |

3. Consider the following ER diagram with two different relations defined on the two entity sets.
In class, I have given you a partial representation of the translated relational tables. Complete this representation by adding/modifying the create table statement(s).




```
create table department
  (dept_no integer,
  dept_name char (20),
  emp_id char (10),
  primary key (dept_no),
  foreign key (emp_id) references employee
    on delete set default on update cascade);
```