Department of Computer Science
New Mexico State University
CS 482/502 Database Management Systems I

Assignment 4: Entity-Relationship Model

This is an individual assignment.

Situation and application requirements:

"ABC media" has a number of digital displays, which are placed in bars and restaurants. Clients can purchase airtime packages for advertising using these digital displays. "ABC media" has hired you as a database administrator to design a database to store the advertisement related information explained as what follows.

The database shall keep track of advertising video information which includes video code and video length. An advertising video can be uniquely identified by its video code. The database also needs to store the information about the sites where the digital displays are located. A display site can be a bar or a restaurant. Each site includes a site code, a phone number, an address, and the number of digital displays in it. Each site is identified by its site code.

Advertising videos can be displayed in a set of sites. Each display site has a set of digital displays. A digital display is identified by its serial number. Every digital display installs a scheduler system (Random, Smart or Virtue) in it. Each digital display belongs to exactly one model. The model number, height, width, depth, weight, and screen size of every model have to be stored.

The database will also monitor the employees of "ABC media" involved in the advertisement. Therefore it needs to store each employee's ID, name, and gender. Each employee is identified by his/her employee ID. An employee can only be a technical support, a salesman, or an administrator. A technical support specializes in at least one display model. For a salesman, we need to store his/her commission rate for each sale. An administrator is paid hourly based, so we will need to know his/her working hours on each working day. An administrator administers a set of display sites. Each display site is administered by at least one administrator.

Clients can make an advertisement by purchasing an airtime package of one of the three classes (economy, whole day, or golden hours) through a salesman. Each airtime package involves exactly one advertising video. Each airtime package is identified by its package ID. The database needs to store each package's start date, last date of broadcasting, and its frequency. Clients name, his/her client ID, address, and phone number are also stored.

Tasks:

1. (60%) Construct an ER diagram for the above database. Model all constraints which can be expressed in ER model. When you construct your ER diagram, state clearly any assumptions you made that do not violate the requirements. (IMPORTANT: Please draw the ER diagram using the notations and symbols in the textbook (instead of following specific software's notation). If you are using other notations, at least half of the points will be deducted.)
2. (5%) State at least two constraints which can NOT be captured by the ER model.
3. (35%) Translate your ER diagram into relational tables. For each relation, identify the primary key and any foreign keys.

Note about drawing ER diagram.

- You may use software (e.g., Power point, Word, Visio, or whatever diagram drawing software) to draw the ER diagram. For your reference, this free online software (https://app.diagrams.net) is very useful.
- If you use any DBMS associated software to draw the ER diagram, please be aware that most of them use different symbols/notations. You need to make sure that your notations/symbols follow the textbook notation convention. Otherwise, points will be deducted.
- You can draw the ER diagram using your hand, then scan and submit the hand-drawn ER diagram.

Submission: You have to submit your assignment electronically (through Canvas). Printed copies are not accepted. Please submit.pdf file with name “hw4-answer-(your banner id)”. See course syllabus for policies on late submission and plagiarism.