Northeastern University
CS5200 – Database Management Systems
Fall 2017, Derbinsky

HW3

This assignment has five (5) problems worth 100 points total. Notes:

- To receive credit, submit to Blackboard **a single ZIP file** that contains a **a single PDF** document, containing your responses to each of the problems.
- You must typeset all written responses and use software of your choice (e.g. OmniGraffle, PowerPoint) to produce professional ER diagrams – hand-drawn ERDs will receive 0% credit.
- All ERDs **must** use the notation introduced in class – 0% credit will be awarded for diagrams using other dialects (e.g. "crow's feet").

Problem 1 (20 points). Produce an ER diagram for the following UNIVERSITY narrative. Note any requirements that are not specified and make appropriate assumptions to complete the specification.

1. The university keeps track of each student's name, student ID, social security number, permanent address, major department, and minor department (if any). Some applications need to refer to the city, state, and ZIP code of the student's permanent address, as well as the student's last name. Both SSN and student ID have unique values for each student.
2. Each department is described by a name, department code, and college.
3. Each course has a course name, description, unique course number, credits, and offering department.
4. Each section has an instructor, semester, year, course, and section number. The section number distinguishes sections of the same course that are taught during the same semester/year.
5. When a student takes a section of a course, s/he receives a letter grade and a numeric grade. Given a numeric grade from the instructor, the letter grade is assigned based upon the university's standard grade-conversion table.

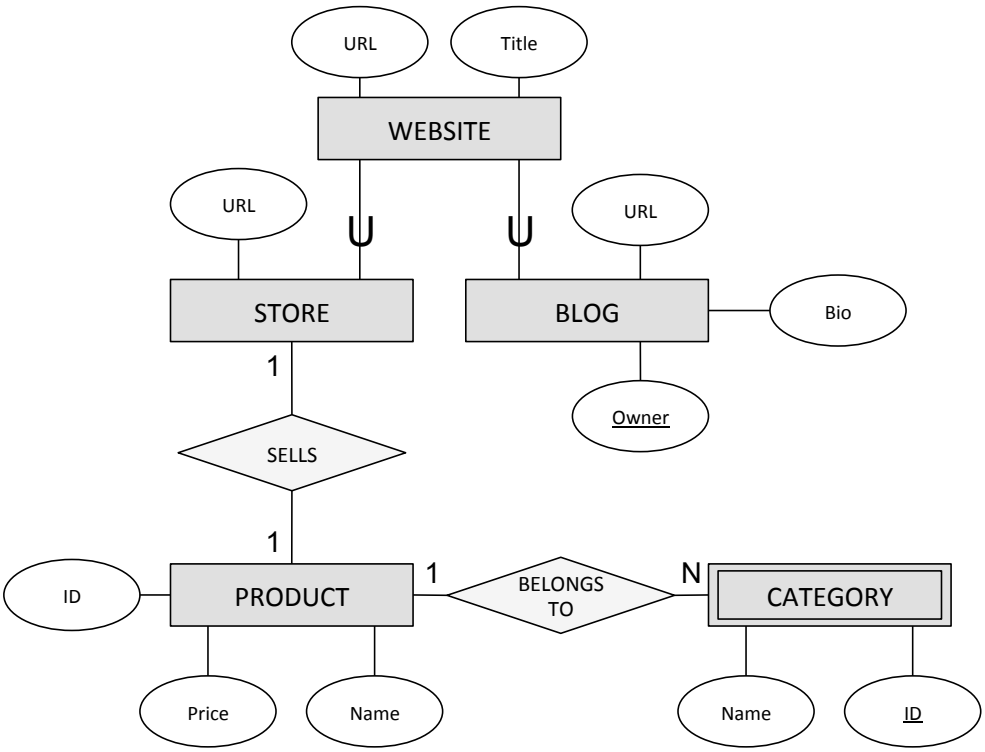
Problem 2 (20 points). Produce an ER diagram for the following description.

A spreadsheet has a unique file location, composed of a path and a file name. A spreadsheet is composed of a set of worksheets, each having a name, unique to that spreadsheet, and a set of cells. Each cell has a unique location within the worksheet, designated by (row, column), and a value.

Problem 3 (20 points). You are given a description and an ER diagram below. Find at least ten (10) mistakes in the diagram. Submit the diagram with your corrections, as well as an English description of each mistake. You must assume that all domain information to be reflected in the diagram is mentioned in the description.

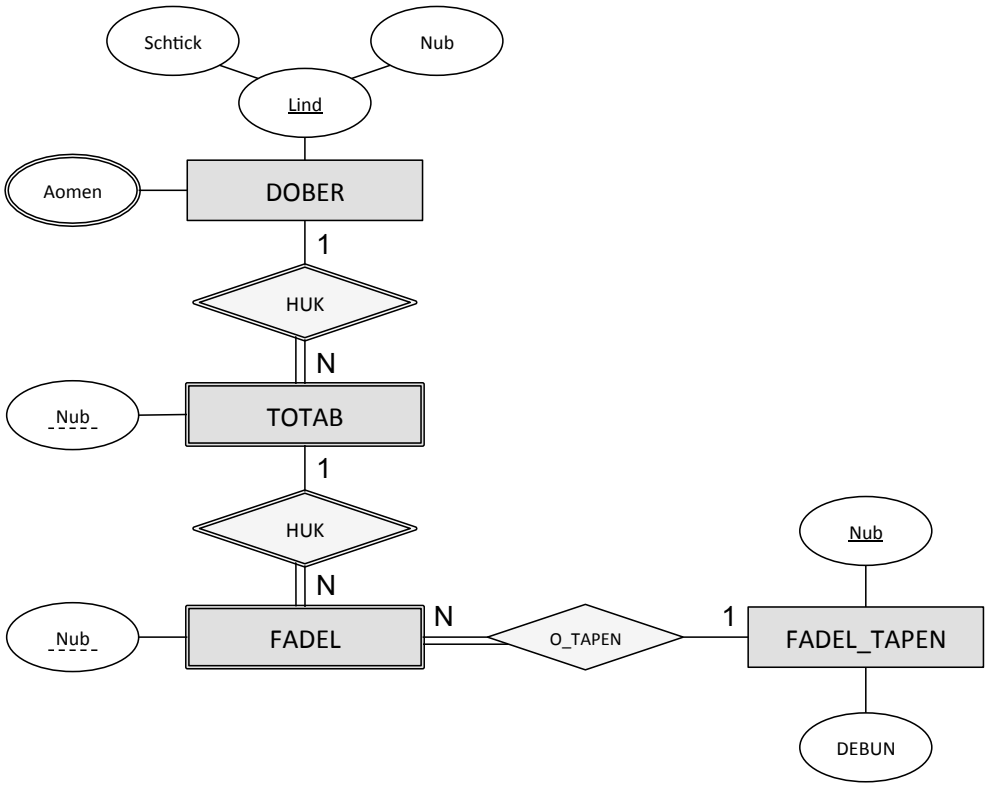
You get two (2) points for each corrected mistake; even if correcting a mistake requires several changes to the diagram, you get only two points. For each correction, you will receive one (1) point for your textual description of the mistake, and one (1) point if you fully correct the issue in your diagram. Please number each textual description, and label the associated change(s) in the diagram, such that your submission is clear and understandable. You will get extra credit if you find mistake(s) your instructor has not anticipated.

Websites at AwesomeSites.me are either stores or blogs. Each site has a unique URL and a descriptive title. Each blog is a single page with biographical information about the owner (note: individuals may own as many blogs as they wish) and a set of posts. A store is a catalog of products. Each product has a unique ID, a description, and a price. Additionally, each product may belong to one or more product categories (used for organization on the site). Each category has a name, unique ID, and an associated color code.



Problem 4 (20 points). You have been given the task of writing a textual description of the ER diagram below, which is unfortunately in a foreign language. For simplicity, your description can make use of typical English grammar rules, such as ending nouns with an "s" (e.g. all Dober**s** ...) and common verb endings (e.g. Totabs are huk'**ed** by Dobers).

The goal of this task it to recognize that a well-written ER diagram can communicate a great deal of domain structure without the need for semantic meaning. However, if you are able to come up with a semantic mapping that is consistent with the diagram, you will be awarded extra credit.



Problem 5 (30 points). Remember the Chinook database?? It's baaaackkk!! :)

Based upon your experience with this database, as well as the relational schema (included below), produce both an ER diagram and narrative for this digital media store.