Washington State University

School of Electrical Engineering and Computer Science

CptS 451 – Introduction to Database Systems

Assigned: May 11, 2020
Dr. Sakire Arslan Ay

Homework-1

Due Date: Sunday, May 17th

Name: _____

Student Number:_____

Question:	Max points:	Score:
(a)	95	
(b)	5	
Total	100	

A group of recent WSU alumni started a company and they are developing an application similar to Blackboard and Piazza. They named their application ClassMeet. ClassMeet supports the most useful features of both systems and yet it is easy to use. You've been offered an internship to help the ClassMeet founders with a database design to underlie their new software. ClassMeet aims to be a new platform that simplifies the tasks of both Q&A handling and grading for students and teaching staff. Every class that is registered in ClassMeet will have users that can post comments, questions, or announcements. Users can be either students or instructors. Here is the information you gather:

1. Each user will be assigned a unique user id when they first join ClassMeet. Users will have a name, consisting of a first name and last name, an email address, and one or more phone number(s); each phone number will consist of its type (e.g., home, mobile, work, etc.) along with the number itself.
2. ClassMeet users can be either students or instructors (or possibly both). In addition, students have a major (e.g., CptS) and instructors have a title (e.g., Professor, Teaching Professor, Instructor, etc.).
3. ClassMeet will store information about courses, which will be identified by a combination of major (e.g., CptS) and course number (e.g., 451). Courses also have a title (e.g., Introduction to Databases) and a level (e.g., undergraduate vs graduate).
4. ClassMeets will also keep track of the course prerequisites. A course can have zero or more prereq courses and it can be the prereq of another course itself.
5. ClassMeet also allows to manage classes – where classes are specific offerings of courses. Each class will have a section number (e.g. 1), starting date, an ending date, a maximum enrollment limit (e.g., 100), a term (e.g., Spring), and a year (e.g., 2020). The classes related to a given course are uniquely identified by the combination of the following: course major and number, section number, semester, and year (e.g., "CptS, 451, 2, Spring, 2020").
6. ClassMeet will keep track of the coursework involved in its classes. A coursework can either be an assignment or an exam. Each coursework will have a unique id and a title (e.g., Homework-1, Midterm-2, etc.). Assignments have deadlines whereas exams and quizzes have times and locations. Each coursework is associated with one particular class.
7. Each instructor will offer zero or more classes; each class must be associated with at least one instructor.
8. Students can take classes, and each student will receive a final grade for every class that he or she takes. A class should have at least one student.
9. Students will take the exams and they will receive a grade for each exam that they take. Students will submit the assignments; but assignments won't be graded.
10. Another major feature of ClassMeet, in addition to class management, will be its social media nature – i.e., posts. A given post will have a unique post id, a kind (Announcement, Question, or Comment), a posting time, and content(text). It will also have a popularity rating computed from the number of likes that it has received (see below).
11. Each post is published by a single user. In addition, users can like posts (popularity rating of a post will be computed from the number of likes).
12. A post can be about a coursework. A given coursework can potentially have many posts about it.
13. If desired, a post can be designated as a response to another particular post.

What to do:

a) **(95pts)** Draw an ER diagram for the **ClassMeet** database. Make sure that your design captures all of implications of the business model, including:
   - all of the relevant entities and their attributes, including keys;
   - all the relevant relationships and associated attributes, appropriate key constraints for the relationships, and appropriate participation constraints for the relationships.

b) **(5pts)** Make sure that your diagram is clear and easy to read. Make sure to use the ER notation we covered in the lecture notes (i.e., the Chen notation). You will be deducted points if you use a different notation.

Submission Instructions:

HW1 will be submitted on Blackboard (HW1 dropbox under "Homeworks"). To create your ER diagram, I suggest you to use draw.io tool (https://www.draw.io/). You may also use your favorite drawing tool (e.g., Visio). HW1 should be submitted in .pdf format (name your file "HW1.pdf").
Email submissions will not be accepted.

Appendix: Grading rubric

Missed relation (-2) or (-3)
Missed attribute (-1)
Missed entity (-3)

Redundant relationship (-2)
Wrong relationship type (-3)
Wrong key (-2) or (-3)
Wrong entity type (-3)
Missed constraints (-1) or (-2) or (-3)