CS 445 Database Assignment #1
Due: October 2, 2007, 1pm!   15 Points

For this assignment, you are to produce an E-R diagram for the Gradebook database described below. After that you are to build the database in MySQL (in PUNetID_gradebook on db.cs.pacificu.edu). Finally, you are to write SQL queries to answer the questions listed below.

The Gradebook

The Gradebook must track Students, Assignments, and Grades for a single class. Students have a name, major, and email address. Assignments have a type, total number of possible points, assignment date, handout (a binary object, maybe a Word or OpenOffice document), an answer key (again a binary object), a due date(just like this class, assignments are due at a particular date and time), and a name. You need to track each student's points scored for each assignment. Each type of assignment is worth some percent of the final grade (i.e. Midterms are worth a total of 30%, Quizzes are worth 20%). This course also has a grading scale (92-100 is an A, 90-92 is an A-, etc). As with this class no late assignments are accepted.

The Data

Once you build your database you need to fill it with the following data:

Use the grading scale from the syllabus of this class. The final grade break down is as follows: Midterm Exams 30%, Quizzes 20%, Projects 30%, Homework 5%, Final Exam 15%,

The assignments for this semester are as follows. The assignment name, assignment date, due date, total points and the location of the binary objects (file) are given. Note that all the files are in /home/chadd/cs445Data on db.cs.pacificu.edu:

Midterm Exam One Date: 2007-10-11 Total Points: 100 Exam1.odt Exam1Key.odt
Midterm Exam Two Date: 2007-11-22 Total Points: 120 Exam2.odt Exam2Key.odt
Final Exam 2007-12-12 Total Points: 150 Final.odt FinalKey.odt

ProjectOne Assigned 2007-09-14 Due 2007-09-28 1pm Total Points: 25 P1.odt P1Soln.odt
ProjectTwo Assigned 2007-10-04 Due 2007-10-21 1pm Total Points: 25 P2.odt P2Soln.odt
ProjectThree Assigned 2007-10-25 Due 2007-11-20 1pm Total Points: 20 P3.odt P3Soln.odt
ProjectFour Assigned 2007-11-21 Due 2007-12-06 1pm Total Points: 30 P4.odt P4Soln.odt

Quiz1 2007-09-27 Total Points: 20 Quiz1.odt Quiz1Key.odt
Quiz2 2007-11-20 Total Points: 20 Quiz2.odt Quiz2Key.odt

Homework1 Assigned 2007-09-18 Due 2007-10-01 1pm Total Points: 10 Hmwk1.odt Hmwk1Soln.odt
Homework2 Assigned 2007-10-16 Due 2007-11-15 1pm Total Points: 10 Hmwk2.odt Hmwk2Soln.odt

The students are listed below. The total points they scored on each assignment is listed below their name. The points are listed in the order the assignments are given above:

Neil Young, ny@ny.com, Computer Science
88 98 112 22 18 19 21 19 14 8 3
Bob Dylan, bd@bd.com, Computer Science
98 98 99 24 19 20 21 20 15 9 9

Woody Guthrie, wg@wg.com, English
72 120 119 25 19 20 21 20 2 2 9
Janice Joplin, jj@jj.com, Biology
98 106 140 24 19 20 21 20 15 10 9
Joni Mitchell, jm@jm.com, Biology
92 118 144 25 19 20 21 20 10 10 0
Kirsten Hirsh, kh@kh.com, Computer Science
99 120 149 25 20 20 21 20 10 10 10

The Database

Build appropriate indexes to support the queries. Be sure to use the proper constraints (FOREIGN KEY, PRIMARY KEY, UNIQUE) as necessary.

The Queries

You must be able to answer all of the following queries using your data model.

1. List all the name of each assignment that has at least 29 possible points.
2. List all the name of each assignment that has at least 11 possible points but less than 30 points.
3. List each Student Name and his or her Major Name. Be sure to list each student exactly once.
4. Find each Student Name and his or her grade on each "Exam". List a Student Name, Assignment Name, and Points Scored.
5. Find each Student's Name, his or her Points Scored on each "Exam", and the percentage grade received on that exam. Sort by Last name and then exam date.
6. List the name of everyone who earned an 84% or better on the Final. Sort by points scored (descending).
7. Find all students who achieved at least one perfect score on any assignment. Print only the Students' names. Only print each student once.
8. Find all students who achieved at least two perfect scores. Print Students' names. Only print each student once. Hint, look at #7 and use a subquery.
9. Print each student's grade on each exam. Sort the list by showing the earliest exams first.
10. What is Bob Dylan's final grade on Exams?
11. What is Janice Joplin's final grade on Projects?
12. Exams were worth 30% of the final grade. Of this 30%, how much did Neil Young receive based on his Exam grades?
    BONUS QUERY
13. What is Joni Mitchell's final grade (given as a percentage) in the class? Given as a letter?

Additionally, you must create a query that a user may want answered and post the description (not the solution) on the CS Messageboards. This query must use at least two Entities and at least one of ORDER BY or GROUP BY. Post this query by **September 25th, 1pm**.

You must choose 4 queries posted to the CS Messageboards and provide SQL statements to solve them. You must also provide an SQL statement to solve your posted query. Do not post a duplicate query!

The Submission

You must produce the E-R diagram in Visio and hand in a hard copy at 1pm, Oct 2.

Your database must be done in PUNetID_gradebook on db.cs.pacificu.edu. The database must be built and the data loaded into it by 1pm on the day this assignment is due. Do not access this particular database until you receive your grade for this assignment. You may continue to access PUNetID_movie and PUNetID_practice.

You must print out the SQL statements to answer each query and hand in a hard copy at 1pm, Oct 2. Do not print out the results of the queries.

Additionally, you need to submit an electronic copy of the Visio diagram (PUNetID_gradebook.vsd) and SQL statements (a text file named PUNetID_gradebookQ.sql) in a file named PUNetID_Gradebook.tar.gz (tar czf PUNetID_Gradebook.tar.gz PUNetID_gradebook.vsd PUNetID_gradebookQ.sql). Submit this file using the submit server on zeus:

$ submit cs445f07 PUNetID_Gradebook.tar.gz

Be sure to save your receipt. You can only submit once.

Notes

Start early! You have plenty of time but errors in the E-R diagram may complicate or make impossible some of the queries. Ask questions! Don't assume! Use the CS Messageboards!

I am not giving you the data in electronic format so as to not constrain your database implementation.

You are welcome to schedule an appointment with me to review your E-R diagram before you start implementing the database. Be sure to have an electronic copy of your diagram somewhere that I can get to it during a review. Placing it on Turing is a good option. Also bring a paper copy of the diagram.

In my experience, writing the queries is significantly harder than creating the E-R diagram or implementing the database.

The IP address of db.cs.pacificu.edu is 64.59.233.234

Good Luck!