Autumn 2019

# Homework 4

Big Data Management

1. Write SQL statements for the database schema shown in the following figure: (4 points)
   (a) Retrieve the names of senior students (class=4) majoring in CS (computer science).
   (b) Retrieve the names of all courses taught by Prof. King in 2007 and 2008.
   (c) For each section taught by Prof. King, retrieve the course number, semester, year and number of students who took section.
   (d) Retrieve the names and transcript of each senior student (class=4) majoring in CS. A transcript includes the course name, course number, credit hours, semester, year and grade for each course completed by the student.

**STUDENT**

| Name | Student_number | Class | Major |
|---|---|---|---|
| Smith | 17 | 1 | CS |
| Brown | 8 | 2 | CS |

**COURSE**

| Course_name | Course_number | Credit_hours | Department |
|---|---|---|---|
| Intro to Computer Science | CS1310 | 4 | CS |
| Data Structures | CS3320 | 4 | CS |
| Discrete Mathematics | MATH2410 | 3 | MATH |
| Database | CS3380 | 3 | CS |

**SECTION**

| Section_identifier | Course_number | Semester | Year | Instructor |
|---|---|---|---|---|
| 85 | MATH2410 | Fall | 07 | King |
| 92 | CS1310 | Fall | 07 | Anderson |
| 102 | CS3320 | Spring | 08 | Knuth |
| 112 | MATH2410 | Fall | 08 | Chang |
| 119 | CS1310 | Fall | 08 | Anderson |
| 135 | CS3380 | Fall | 08 | Stone |

**GRADE_REPORT**

| Student_number | Section_identifier | Grade |
|---|---|---|
| 17 | 112 | B |
| 17 | 119 | C |
| 8 | 85 | A |
| 8 | 92 | A |
| 8 | 102 | B |
| 8 | 135 | A |

2. Write a view in SQL on the following database schemas. A view that has the project name, controlling department name, number of employees and total hours worked per week on the project for each project. (1 point)

   EMPLOYEE
   (SSN , First_Name,Last_Name, ,BDate,Address,Sex,Salary,Supervisor_SSN,Department_NO )
   DEPARTMENT
   (Department_NO, Department_Name, Manager_SSN,Manager_Start_Date)
   PROJECT
   (Project_NO , Project_Name, Location,Department_NO)
   WORKS_ON
   (Employee_SSN, Project_NO, Hours)

3. Consider the following schema (the data type of each attribute is given following the attribute names and the primary keys are underlined): (2.5 points)

   Suppliers (**sid**: integer, sname: string, address: string)
   Parts (**pid**: integer, pname: string, color: string)
   Catalog (**sid**: integer, pid: integer, cost: real)

   The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL:

(a) List the pnames of parts for which there is some supplier. (0.5 points)
(b) Find the pnames of parts supplied by Acme Widget Suppliers and no one else (hint: Use "No exists" with a subquery) (See https://www.tutorialgateway.org/sql-not-exists-operator/) (1 point)
(c) For every supplier that only supplies green parts, show the name of the supplier and the total number of parts that she supplies. (1 point)

4. Which one of the following is NOT a part of the ACID properties of database transactions? (0.5 point)

   (A) Atomicity
   (B) Consistency
   (C) Isolation
   (D) Deadlock-freedom