CS 405G Introductions to Database Systems  
Homework 3  due 3/4/2015

1. (4pt) Textbook 5.2.
   Consider the following schema:
   
   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) Find the \textit{pnames} of parts for which there is some supplier.
   (b) Find the snames of suppliers who supply every part.
   (c) Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).
   (d) Find the sids of suppliers who supply a red part and a green part.

2. (6pt) Textbook 5.8.
   Consider the following relations:
   
   Student(snum: integer, sname: string, major: string, level: string, age: integer)
   Class(name: string, meets_at: time, room: string, fid: integer)
   Enrolled(snum: integer, cname: string)
   Faculty(fid: integer, fname: string, deptid: integer)
   
   The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class.
   (a) Write the SQL statements required to create these relations, including appropriate versions of all primary and foreign key integrity constraints (3pt)
   (b) Express each of the following integrity constraints in SQL unless it is implied by the primary and foreign key constraint; if so, explain how it is implied. If the constraint cannot be expressed in SQL, say so. For each constraint, state what operations (inserts, deletes, and updates on specific relations) must be monitored to enforce the constraint.
   I. Every class has a minimum enrollment of 5 students and a maximum enrollment of 30 students. (1pt)
   II. The department with the most faculty members must have fewer than twice the number of faculty members in the department with the fewest faculty members. (2pt)