Assignment 1 (25 pts)
Due Date 1/21 before midnight

1) Entity Relational Diagram Design (15 pts)

This problem is concerned with a database that stores information about properties managed by AMC, a property management corporation. AMC has many properties including Tivoli, Stoneridge, etc.

Suppose you are hired by the AMC to design a database to manage the properties. Below we describe the entities and the relations that needed to be captured by your design.

- Each property has a name, street number, street name, zip code and one phone number. The property names are unique. Example: (‘Tivoli’, ‘2841’, ‘SW 13th ST’, ‘32608’, ‘FL’, ‘352265021’),

- Each property has a number of apartments and each apartment is associated with an apartment number.

- Each apartment has one or more residents. The information stored for a resident includes his/her name and sex. Assuming names are unique among the residents in the same apartment.

- An employee of AMC is uniquely identified by his/her SSN. Moreover, we store his/her name.

- An employee may work at several properties of AMC. For instance, Smith is working at ‘Tivoli’ on Tuesday and Friday and at ‘Stoneridge’ on Monday, Wednesday and Thursday. For every employee we record the percentage of time he or she works at each property. Thus, employee ‘Smith’ above, would be recorded as working at 40% at ‘Tivoli’ and 60% at ‘Stoneridge’.

- Each property has one property manager and one leasing manager.

Give the E.R. diagram for the database described above. Make sure to indicate the primary and partial keys, cardinality constraints, weak entities (if applicable).

2) Phase 1 (7 pts)

Teenagers everywhere have started using temporary social media. These types of social media sites have surpassed traditional social media in terms of pictures shared. Some of these applications include Snapchat (www.snapchat.com), WhatsApp (www.whatsapp.com), BBM (us.blackberry.com/bbm.html), Kik (kik.com), Viber (www.viber.com). Recently, the number of snaps in Snapchat surpassed the number of photos uploaded to Facebook(http://www.businessinsider.com/snapchat-edges-past-facebook-in-photos-2013-11).

The task of this project is to take on the role of an application developer and database designer, study and analyze available temporary social media websites, and design and implement parts of their functionality with an emphasis on the database management component. The aforementioned websites will help you understand the requirements of your task.

This project extends over the whole semester and is subdivided into several phases. *After* the first phase students will merge into groups of 1 to 4 students.

We will be using PostgreSQL as our database server. PostgreSQL is free and open source. All students must sign up for department managed postgres access.
For the project students are free to use their own systems. Students may launch their system on the department servers or their own machines.

The programs should be web-based (java, scala, python, php, cgi) or app-based using MacOs or Android os. If you are not familiar with any of these languages you should quickly come up to speed with one. Computer Scientist must be able to quickly learn and adapt to new programming languages techniques and infrastructure.

For the first phase, students must put on the hat of an application developer and database designer. You need to ask yourself the following questions:

- What are the main functions that the web-based user interface should provide? Examples include, allow users to search for pictures with certain hashtags or view the recently posted pictures of all their friends.

- How do the difference functions work together? For example, one can only send a picture or a text to a user if they are friends.

- Which data are needed to support the functions described? What is a plan to obtain such data? For example, I can generate synthetic users with a python script.

- Which public domain and/or proprietary software is needed to perform the task? For example, you will need a Mac developers account and a proprietary postgresql driver.

This deliverable should be in a text document that presents a clear and structured descriptions of requirements that you think your software solution should later fulfil. This means you need to carefully think about how you will design this application and what is involved. We are looking for well thought out proposals that show *creativity* and *forethought*.

Note, this is not a binding document for later, so if you have better ideas at a later time you may make those changes. You do not have to implement this system now, you are only enumerating the requirements and functions.

This phased is to be done individually. Groups will be formed later in the semester. Please abide by the University Policy on academic conduct contained in the syllabus.

### 3) Tasks (2 pts)

- Sign up for GitHub
- Sign up for CISE Department
- Sign up for Piazza
- Send your Github user name, and your cise user name to ypeng@cise

### 4) Survey (1 pt)

1. What languages are you familiar with (circle each)?
   
   JAVA, C++, Python, PHP, HTML, Javascript, CSS, Other: _______

2. Do you have any experience with databases? yes/no?  
3. If yes, please list any DBs you have used: __________
4. Have you developed an App (iPhone/Android)?  
5. Have you used a version control system? yes/no  
   
   git/svn  
6. Do you have experience designing websites? yes/no  
7. Do you want to go to grad school? no/masters/phd  
8. What are your career goals?  
9. Have you taken software engineering?  
10. What other courses are you taking?