Part 1

Use the following database to answer all questions in Part 1

STAFF(StaffID, StaffName, StaffEmail, Title, Salary, SupervisorID)

APPLICANTS(ApplicantID, ApplicantName, ApplicantEmail, ApplicantPhone, DOB, StaffID)

EVENTS(EventID, Description, Location, EventDate)

ATTENDS(ApplicantID, EventID, Rating)

The STAFF table stores information about the Admissions department staff (the SupervisorID field of a record must match the StaffID of another record).

The APPLICANTS table stores information about people applying to a college. The StaffID of an applicant keeps track of the primary contact person for an applicant.

The EVENTS tables stores information about application events.

The ATTENDS table stores information about which applicants attended which events (the Rating field is an integer to store how well an applicant liked an event).
Create a relational algebra query to answer all questions in Part 1.

Question 1
Write a query to output the name, email, and salary for all staff members with a title of “Counselor”.

Question 2
Write a query to output the name, title, and supervisor’s name for all staff members.

Question 3
Write a query to output the average salary of all staff members.

Question 4
Write a query to output the name, email, phone, and the name of the staff member for all applicants whether or not they have a staff contact person.

Question 5
Write a query to output the name and email of all applicants and staff members. Every applicant and staff member should be in this output. Assume there is no one who is both an applicant and a staff member.

Question 6
Write a query to output, for each job title, the number of staff members who have that job title.

Question 7
Write a query to output the names of all applicants who have attended an event on November 1, 2012.

Question 8
Write a query to print, for all events that occur on November 1, 2012, the name of the applicant, the name of their primary contact person, and the rating the applicant gave to the event.

Question 9
Write a query to print the names of all applicants who have never attended an event.

Question 10
Write a query to print the names of all applicants who have attended every event.

Part 2
Convert the following ER diagram into a set of tables.
Part 3

Start with the following ER diagram:

Modify it to create a new EER diagram. Assume that the following must be represented:

- A Person could be a Hero, a Villain, or neither. It is not possible for a person to be both a Hero and a Villain.
- Heroes have a superpower and a weakness.
- Villains have a superpower and an obsession.
- Heroes can be allied with other Heroes.
- Villains can be allied with other villains.
- Actions are either Crimes or Acts of Justice. An Action could be both of these.
- Crimes have a crimeID and a punishment.
- Acts of Justice have a reason and an outcome.
- All Heroes solve crime and do acts of justice. A crime is solved by just one Hero, but an Act of Justice could be done by multiple Heroes.
- All Villains commit crimes, and a crime could be done by more than one villain.
- All people could be a victim of a crime, though they don’t have to be.
- A crime need not have a victim.

Any other assumptions you make, let me know.
Make an ER diagram that could store information about polls for a Presidential election. The following must be represented in this diagram.

- All polls are conducted by polling organizations.
- For each polling organization, we keep track of the name, website, and address of the organization. Every polling organization conducts at least one poll.
- Some polls are sponsored by a media company.
- For each media company, we keep track of the name, website, and type of media (print, television, etc.) Each media organization sponsors at least one poll.
- Each poll includes the percentage of support for Obama, the percentage of support for Romney, the dates the polling was done, whether it’s a tracking poll and the margin of error.
- Some polls are national polls; all the other polls are conducted in a particular state. If it’s a state poll, we keep track of what state it’s a poll of.
- For each state, store the name of the state, the number of electoral votes, and the winner of the state in the 2008 election.
- People write articles about polls. An article could include information about many polls, but it’s possible that a poll was not included in any article. An article includes an author, a publication date, and the text of the article.
- Some polls include subgroup polls. A subgroup poll includes the subgroup type (for example, Women), the percentage of support for Obama for that subgroup, the percentage of support for Romney for that subgroup, and the margin of error for that subgroup.
- Not all polls have subgroups, and a poll could have multiple subgroups.