COMP 5531 FILES AND DATABASES

Bipin C. **Desai**

Assignment 4 Due: To be uploaded to CrsMgr by the deadline

1. (8 points) Consider the following database scheme:

MOVIE(MName, Year, Profit)
DIRECTED(DName, MName, Year, Earnings)
ACTED_IN(AName, MName, Year, Earnings)
REVIEW(RName, MName, Year, Number_of_stars).

Express queries a, b, c, and d in Tuple Calculus.

(a) Find the name and year of all movies in which *Donna Prima* has acted and which have a profit of at least 100 million.

(b) Find the names of all actors who have earned more than 1 million acting in a movie to which the reviewer *Art Siguy* gave 0 stars.

(c) Find the name of the actor(s) who had the highest earnings in a single movie, of all actors in 1996.

(d) Find the names of all reviewers who have given 0 stars to all movies in which *Slash Gore* has acted.

Express queries e, f, g and h in Domain Calculus.

(e) Find the names of all directors who have directed *Donna Prima* and *Mimi Me* in the same movie.

(f) Find the names of all reviewers who, in 1996, gave 5 stars to a movie which did not make a profit.

(g) Find the names of the director and actors of the 1977 movie which had the highest profit.

(h) Find the names of all actor/directors who have acted in every movie which they have directed.

2. (5 points) Consider the following database scheme:

STUDENT(ID, SName)
ENROLL(ID, CourseNo, Section)
TEACH(Prof, CourseNo, Section)
GRADES(ID, CourseNo, Section, Mark, Year).

Express the following in SQL.

(a) Find all pairs of student ids (id1, id2) such that student id1 has a better mark than student id2 in at least one course they have both taken.

(b) List the names of all students enrolled in all courses taught by *Dr. Hu*.

(c) For each student, list the name of the student, the number of courses taken by the student,

and their average mark in those courses.

(d) Create a view named ENROLL_HISTORY which lists, for each course, the name of all students who have taken the course, together with their mark in the course, the year in which they took the course, and their professor's name. (Note: You may assume that each professor teaches the same courses/sections year after year).

(e) Student 666 has broken into the university computer system. Give the SQL statement to change all of the student's marks to 100.

3. (2 points)

If possible, express each of the following in Relational Algebra. If it is not possible to do so, explain why.

(a) $\{A\,[x, y]\,|A \in R_1 \wedge \exists B(B \in R_2 \wedge A\,[x] > B\,[x])\}$

(b) $\{< x > |\forall y(< x, y > \in R_1 \rightarrow \exists z(< y, z > \in R_2))\}$