CS 631: DATA MANAGEMENT SYSTEMS DESIGN

ASSIGNMENT 3

EXERCISE 1 (Constraints in SQL)

Consider the following database schema:

STUDENTS (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*)
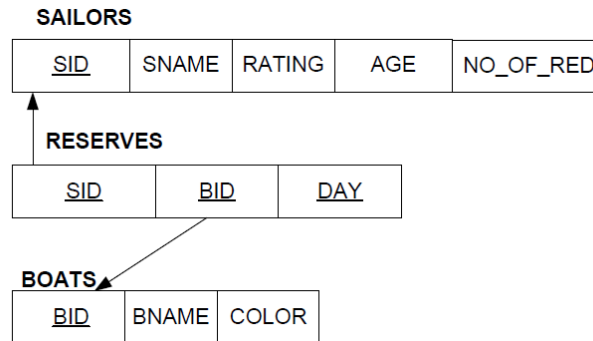
The meaning of these relations is straightforward; for example, ENROLLED has one record per student-class pair such that the student is enrolled in the class.
Express each of the following integrity constraints in SQL unless it is implied by the primary and foreign key constraint; if the constraint cannot be expressed in SQL, say so.

1. No faculty member from department number 5 can teach more than four courses
2. The number of CS majors must be more than the number of math majors.
3. No student should enroll in more than 2 classes offered by the same faculty.

EXERCISE 2 (Triggers)

Consider the following database schema:

SAILORS

SID	SNAME	RATING	AGE	NO_OF_RED

RESERVES

SID	BID	DAY

BOATS

BID	BNAME	COLOR

The meaning of these relations is straightforward. Primary key attributes are underlined. Thus SID is the primary key for SAILORS, BID is the primary key for BOATS, and all three attributes of RESERVES together form the primary key of RESERVES. Arrows indicate foreign keys. Attribute NO_OF_RED records the number of reservations of red boats by a sailor. Write (a) an SQL row level trigger and (b) an SQL statement level trigger that maintain the value of attribute NO_OF_RED every time a reservation is made.