

## MSCS542 – Access Database Project

This project is a group project. You will form teams of three members each (not including anyone you worked with on Lab3). The purpose of this project is to write applications for the Merriest College database. The chosen environment is Microsoft Access2013. You are to write appropriate applications that will update and query the database **interactively**.

Merriest College requires a system that will satisfy the following requirements

- Each faculty member is assigned to exactly one department.
- Each student can be employed by more than one department. However, each student may work for a given department in only a single capacity.
- Each student graduated from exactly one high school.
- Each student can major in more than one department. For each major, the student will have a faculty member as an advisor. The advisor must be assigned to the department in which the student is majoring.

### Database Design

DEPT (DEPTNUMB, DEPTNAME)

FACULTY (FACNUMB, FACNAME, DEPTNUMB)  
FK DEPTNUMB references DEPTNUMB in DEPT

COURSE (CRSECODE, CRSEDESC, NUMBCRED)

HIGHSCHL (HSCODE, HSNAME)

STUDENT (STUNUMB, STUNAME, GPA, HSCODE)  
FK HSCODE references HSCODE in HIGHSCHL

STUMAJ (STUNUMB, FACNUMB)  
FK STUNUMB references STUNUMB in STUDENT  
FK FACNUMB references FACNUMB in FACULTY

STUDEPT (STUNUMB, DEPTNUMB, CAPACITY)  
FK STUNUMB references STUNUMB in STUDENT DELETES CASCADE  
FK DEPTNUMB references DEPTNUMB in DEPT DELETES CASCADE

FACCRSE (FACNUMB, CRSECODE, NUMTIMES)  
FK FACNUMB references FACNUMB in FACULTY DELETES CASCADE  
FK CRSECODE references CRSECODE in COURSE DELETES CASCADE

STUCRSE (STUNUMB, CRSECODE, GRADE)  
FK STUNUMB references STUNUMB in STUDENT DELETES CASCADE  
FK CRSECODE references CRSECODE in COURSE DELETES CASCADE

The system you develop must be able to handle the following queries:

1. List the contents of each table. (A separate query for each table.)
2. For a given faculty member, list the number (D 4) and name (C 20) as well as the number (D 3) and name (C 20) of the department to which the faculty member is assigned.
3. \*\* For a given student, list the number (D 4), name (C 20), and the GPA (D 3,2). In addition, for each major the student has, list the number and name of the student's advisor, and the number and name of the department in which the student is majoring.
4. For a given high school, list the code (D 4) and the name (C 20), as well as the number and name of all the students at Merriest College who graduated from the high school.
5. \*\* For a given department, list the number and name as well as the number and name of all the faculty members assigned to the department.
6. For a given department, list the number and name as well as all the students who work for the department and the capacity (C 20) in which each works.
7. For a given faculty member, list the number and name as well as the numbers, names and GPAs of all the students advised by the faculty member.
8. \*\* For a given course, list the course code (C 8), description (C 20), and number of credits (D 2) offered by the course. In addition, for each faculty member who has taught the course, list the number and name of the faculty member as well as the number of times (D 2) the faculty member has taught the course.
9. **(Bonus)** \*\* For a given student, list the number, name, and GPA of the student as well as:
  - The number and name of the student's advisor(s).
  - The number and name of each of the departments in which the student is majoring.
  - The number and name of the high school from which the student graduated.
  - For each department in which the student is working, list the number, the name, and the capacity in which the student works for the department.
  - For each course the student has taken, list the number, description, number of credits, and the grade received (D 3,2).
  - Note: This is a single query in which all of the above information is listed for the given student. It is not 5 separate queries.

Your system must also allow the user to insert, update and delete data. Of course, you must maintain the integrity of the database! (What happens if a student is deleted? An instructor is added? The user attempts to add an existing student? ...) You must support some form of updates and deletes which require you to maintain referential integrity.

The program must be menu driven. You should allow the user to request predefined reports. These reports consist of the starred (\*\*) queries, with the words “**For a given**” replaced with “**For each**”. The output must be well formatted.

The following is a list of due dates for the various stages of the project (along with frequent progress checks!):

Thursday, Oct. 16 (Test1 is this day.)	Timeline for all tasks. Division of tasks. List and description of all tasks.
Tuesday, Oct 21	Database Populated and x% of queries completed, where x is huge. List and complete description of all reports. "Look and feel" of the application (menus, forms, reports, etc).
Thursday, Oct 23	All queries completed. All forms and reports designed, with most completely implemented. Preliminary User's Guide due.
Tuesday, Oct 28	Presentation of your project. Fully executable system. User's guide. --Purpose of project. --How to start/quit the database. --Basic instructions/help facility.

You must populate your database according to the following *minimal* constraints:

- At least 4 departments
- At least 4 faculty members per department
- At least 4 courses per department
- At least 6 high schools
- At least 4 students who graduated from each high school
- At least 6 college students who have at least 2 majors (at least 2 of these students must have 3 majors)
- At least 5 students who have at least 2 campus jobs (at least 2 of these students must work in 3 departments)
- Each faculty member has taught at least one course
- Every student has taken at least 4 courses

I may give you the actual test data for the project shortly before the due date. Be sure to thoroughly test your applications on your test data. At the beginning of class on the due date, your database would need to contain exactly and only my test data.

Notes for page 2: (D 3) means an integer up to 3 digits long

(C 20) means a string up to 20 characters long

(D 3,2) means a real with 3 digits, 2 of which are after the decimal point