

**DASC 5333 Database Systems for Data Science**  
**CSCI 4333 Design of Database Systems**  
**Spring 2023**  
**Suggested Solution to Homework #1**

Annotations on solutions are included below. Students do not need to include annotations.

2 (a). For example,

The screenshot shows a query editor window titled "Query1". It displays two tables: "faculty" and "department". The "faculty" table has fields: facId (primary key), fName, lName, deptCode, and rank. The "department" table has fields: deptCode (primary key), deptName, schoolCode, and numStaff. A line with an equals sign and arrows indicates a join between the deptCode fields of the two tables.

| Field:    | facId                               | fName                               | lName                               | rank                                | deptName                            | schoolCode               |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| Table:    | faculty                             | faculty                             | faculty                             | faculty                             | department                          | department               |
| Sort:     |                                     |                                     |                                     |                                     |                                     |                          |
| Show:     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Criteria: |                                     |                                     |                                     |                                     |                                     | = 'CSE'                  |
| or:       |                                     |                                     |                                     |                                     |                                     |                          |

(b) For example,

Query2

faculty

- \*
  - facId
  - fname
  - lname
  - deptCode
  - rank

department

- \*
  - deptCode
  - deptName
  - schoolCode
  - numStaff

school

- \*
  - schoolCode
  - schoolName

|           |                                     |                                     |                                     |                                     |                                     |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field:    | schoolCode                          | schoolName                          | department: deptName                | faculty: [faculty].[fname]          | rank                                |
| Table:    | school                              | school                              | department                          | faculty                             | faculty                             |
| Sort:     |                                     |                                     |                                     |                                     |                                     |
| Show:     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: |                                     |                                     |                                     |                                     |                                     |
| or:       |                                     |                                     |                                     |                                     |                                     |

(c)

Query3

student

- \*
  - stuld
  - fname
  - lname
  - major
  - minor
  - ach
  - advisor

department

- \*
  - deptCode
  - deptName
  - schoolCode
  - numStaff

Join Properties

|                  |                   |
|------------------|-------------------|
| Left Table Name  | Right Table Name  |
| department       | student           |
| Left Column Name | Right Column Name |
| deptCode         | major             |

1: Only include rows where the joined fields from both tables are equal.

2: Include ALL records from 'department' and only those records from 'student' where the joined fields are equal.

3: Include ALL records from 'student' and only those records from 'department' where the joined fields are equal.

OK Cancel New

Join properties of the relationship between student and department should be set for a 'right join' (option 3)

|           |                                     |                                     |                                     |                                     |                          |                          |                          |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| Field:    | stuld                               | fname                               | lname                               | major: deptName                     |                          |                          |                          |
| Table:    | student                             | student                             | student                             | department                          |                          |                          |                          |
| Sort:     |                                     |                                     |                                     |                                     |                          |                          |                          |
| Show:     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Criteria: |                                     |                                     |                                     |                                     |                          |                          |                          |
| or:       |                                     |                                     |                                     |                                     |                          |                          |                          |

(d)

Query4

**A second instance of the department table, department\_1 is created for minor.**

**A relationship between student and department\_1 is created. Its join properties is set for a left join of the student table with department\_1.**

Join Properties

Left Table Name: student  
Right Table Name: department\_1  
Left Column Name: minor  
Right Column Name: deptCode

1: Only include rows where the joined fields from both tables are equal.  
 2: Include ALL records from 'student' and only those records from 'department\_1' where the joined fields are equal.  
 3: Include ALL records from 'department\_1' and only those records from 'student' where the joined fields are equal.

OK Cancel New

| Field:    | stuld                               | fname                               | lname                               | major: deptName                     | minor: deptName                     |                          |                          |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|
| Table:    | student                             | student                             | student                             | department                          | department_1                        |                          |                          |
| Sort:     |                                     |                                     |                                     | Ascending                           |                                     |                          |                          |
| Show:     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Criteria: |                                     |                                     |                                     |                                     |                                     |                          |                          |
| or:       |                                     |                                     |                                     |                                     |                                     |                          |                          |

(e)

Query5

| Field:    | schoolCode                          | department: deptName                | faculty: [faculty].[fname] + ' ' + [faculty].[lname] | advisee: [student].[fname] + ' ' + [student].[lname] |
|-----------|-------------------------------------|-------------------------------------|--|--|
| Table:    | school                              | department                          |  |  |
| Sort:     |                                     |                                     |  |  |
| Show:     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/>                  | <input checked="" type="checkbox"/>                  |
| Criteria: | = [Enter school code: ]             |                                     |  |  |
| or:       |                                     |                                     |  |  |

(f)

**Query6**

department

\*

- 🔑 deptCode
- deptName
- schoolCode
- numStaff

|           |                                     |                                     |                                     |  |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|--|
| Field:    | deptCode                            | deptName                            | numStaff                            | Staff level: IIf([department.numStaff]<=5,'lo' ▾ |
| Table:    | department                          | department                          | department                          |  |
| Sort:     |                                     |                                     |                                     |  |
| Show:     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/>              |
| Criteria: |                                     |                                     |                                     |  |
| or:       |                                     |                                     |                                     |  |

**Q5**

student

\*

- 🔑 stuld
- fname
- lname
- major
- minor
- credits
- advisor

faculty

\*

- 🔑 factd
- fname
- lname
- deptCode
- rank

|           |  |  |                                     |   |
|-----------|--|--|-------------------------------------|---|
| Field:    | student: [student.fname]+' '+[student.lname] | faculty advisor: [faculty.fname]+' '+[faculty.lname] | credits student                     | status: IIf([student.credits]>=90,'senior',IIf([student.credits]>=60,'jun |
| Table:    |  |  |                                     |   |
| Sort:     |  |  |                                     |   |
| Show:     | <input checked="" type="checkbox"/>          | <input checked="" type="checkbox"/>                  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/>                                       |
| Criteria: |  |  |                                     |   |
| or:       |  |  |                                     |   |

Note that the field of column 4 should read:

Staff level:IIF([department.numStaff]<=5, 'low', IIF([department.numStaff]<=10, 'medium', 'high'))