CSCI321 – Fall 2012
Homework Set 3
Solutions

Problem 4.10

No solutions given.

Problem 4.12

(a) Retrieve the names of all senior students majoring in 'COSC' (computer science).

```
SELECT Name
FROM STUDENT
WHERE Major='COSC'
```

(b) Retrieve the names of all courses taught by professor King in 85 and 86.

```
SELECT CourseName
FROM COURSE, SECTION
WHERE COURSE.CourseNumber=SECTION.CourseNumber AND Instructor='King'
AND (Year='85' OR Year='86')
```

Another possible solution uses nesting as follows:

```
SELECT CourseName
FROM COURSE
WHERE CourseNumber IN ( SELECT CourseNumber
FROM SECTION
WHERE Instructor='King' AND (Year='85' OR Year='86') )
```

(c) For each section taught by professor King, retrieve the course number, semester, year, and number of students who took the section.

```
SELECT CourseNumber, Semester, Year, COUNT(*)
FROM SECTION, GRADE_REPORT
WHERE Instructor='King' AND SECTION.SectionIdentifier=GRADE_REPORT.SectionIdentifier
GROUP BY CourseNumber, Semester, Year
```

(d) Retrieve the name and transcript of each senior student (Class=5) majoring in COSC. Transcript includes course name, course number, credit hours, semester, year, and grade for each course completed by the student.

```
SELECT Name, CourseName, C.CourseNumber, CreditHours, Semester, Year, Grade
FROM STUDENT ST, COURSE C, SECTION S, GRADE_REPORT G
WHERE Class=5 AND Major='COSC' AND ST.StudentNumber=G.StudentNumber AND
G.SectionIdentifier=S.SectionIdentifier AND S.CourseNumber=C.CourseNumber
```

(e) Retrieve the names and major departments of all straight A students (students who have a grade of A in all their courses).

```
SELECT Name, Major
FROM STUDENT
WHERE NOT EXISTS ( SELECT *
FROM GRADE_REPORT
WHERE StudentNumber= STUDENT.StudentNumber AND NOT(Grade='A'))
```

(f) Retrieve the names and major departments of all students who do not have any grade of A in any of their courses.

```
SELECT Name, Major
FROM STUDENT
WHERE NOT EXISTS ( SELECT *
FROM GRADE_REPORT
WHERE StudentNumber=STUDENT.StudentNumber AND Grade='A' )
```

Problem 5.5

(a) For each department whose average employee salary is more than $30,000, retrieve the department name and the number of employees working for that department.

```
SELECT DNAME, COUNT (*)
FROM DEPARTMENT, EMPLOYEE
WHERE DNUMBER=DNO
GROUP BY DNAME
HAVING AVG (SALARY) > 30000
```

(b) Suppose we want the number of male employees in each department rather than all employees (as in Exercise 5.4a). Can we specify this query in SQL? Why or why not?

```
SELECT DNAME, COUNT (*)
FROM DEPARTMENT, EMPLOYEE
WHERE DNUMBER=DNO AND SEX='M' AND DNO IN ( SELECT DNO
FROM EMPLOYEE
GROUP BY DNO
HAVING AVG (SALARY) > 30000 )
GROUP BY DNAME
```