Unit 7 – Structured query language

These solutions are based on answers provided by Mr Tony Crewe, The Glennie School, and by Mr Daniel Haines, Kenmore SHS.

Activity 7.1

2
a
SELECT type, rate
FROM devices

b
SELECT *
FROM job

c
SELECT name
FROM technicians
WHERE id_numb = 1310

d
SELECT type
FROM devices
WHERE rate = 30

e
SELECT distinct id_numb
FROM experience
WHERE qualification = 'E'

f
SELECT job_numb, id_numb, type, owner
FROM job
WHERE ready = 'Yes'

4
a   What is the identity number of the technicians qualified to work on PCs?

b   Display the job number and type for job number 1009.

c   List the type of repair being carried out by technician 1470.

d   Show all the data contained in the experience table.

Activity 7.2

1
a
SELECT subjname
FROM subject

b
SELECT stname, stnumb
FROM student

c
SELECT grade
FROM student
WHERE stnumb = '3994'

d
SELECT stname
FROM student
WHERE grade = 7

e
SELECT stnumb, subjnumb
FROM results
WHERE percent > 0.8

f
SELECT stname
FROM student
WHERE NOT grade = 6

   [or WHERE grade <> 6]

g
SELECT stnumb, grade
FROM student
WHERE grade = 5
OR grade = 7

h
SELECT stnumb, percent
FROM results
WHERE percent > 0.5
AND subjnumb = '18'

2.
a   List the names of the male students

b   What are the names, grade and date of birth for students in grade 5, born since 2001?

c   Show all results for students who scored between 50% and 80%.

d   Which teachers are not home room teachers?

3
a
SELECT stname
FROM student
WHERE born between #01/01/01# AND #31/12/05#

Note: For date queries some computers will use US coding i.e. mm/dd/yy instead of dd/mm/yy.

b
SELECT distinct stnumb
FROM results
WHERE subjnumb in ('12', '14', '15')

c
SELECT stname
FROM student
WHERE stname like 'H*'

d
SELECT stname
FROM student
WHERE stname like '*o*'

4
a
insert into student
values ('9874', 'Young,J', 'F', 4, 3/06/01)

b
update student
set born = 7/11/2000
where stname = 'Morgan, D'

c
delete from student
where stname = 'Smith,J'

Activity 7.3

1

Teacher: (tname, grade, room)
⇑
Subject: (subjname, tname)
         =art

b

Student: (stnumb, stname, gender,   )
⇑   = 'M'
Results: (stnumb, subjnumb, percent)
                         > 80%

c

Results: (stnumb subjnumb, percent)
⇑   =12
Student: (stnumb,   , grade)
                  = 7

d

Teacher: (tname,   room)
⇑
Subject: (subjnumb, tname)
⇑
Results: (stnumb, subjnumb,   )
⇑
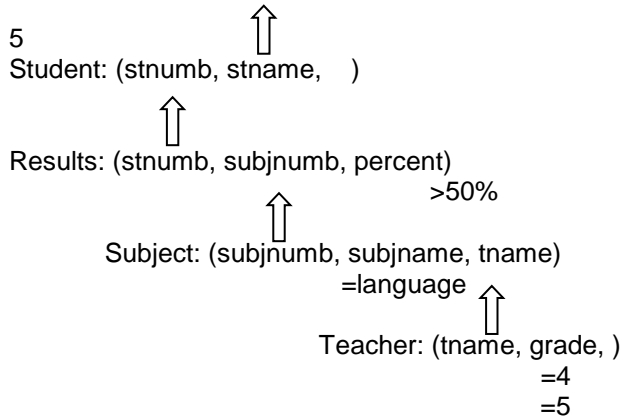Student: (stnumb,   ,grade,   )
                = 7

2

a   Which is the room of the art teacher?

b   Which males score over 80% in any subject.

c   What is the score for students not in grade 7 doing subject 12?

d   Identify the rooms for teachers of Year 7.

3   ⇑
        Subject: (subjname, tname)
                            ⇑
           Teacher: (tname,   , room)
                           =A2

SELECT subjname
FROM subject
WHERE tname in
      (SELECT tname
      FROM Teacher
      WHERE room = 'A2')

4

Subject: (subjnumb, subjname,   )
⇑
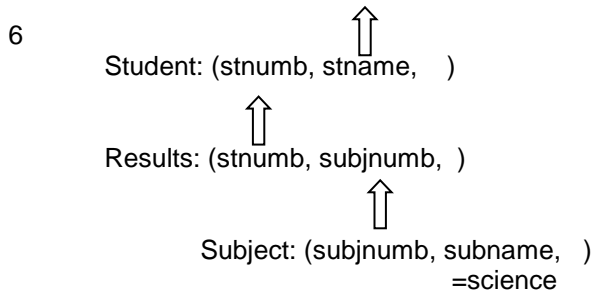Results: (stnumb, subjnumb, percent)
                          > 90%
SELECT subjname
FROM subject
WHERE subjnumb in
      (SELECT subjnumb
      FROM results
      WHERE percent >0.9)

5

Student: (stnumb, stname,   ) ⇧

Results: (stnumb, subjnumb, percent) ⇧
                              >50%

Subject: (subjnumb, subjname, tname) ⇧
                =language

Teacher: (tname, grade,)
                     =4
                     =5

```
SELECT stname
FROM student
WHERE stnumb in
     (SELECT stnumb
     FROM results
     WHERE percent >.5
     AND subjnumb in
          (SELECT subjnumb
          FROM subject
            WHERE subjname = "language"
            AND tname in
                 (SELECT tname
                 FROM teacher
                 WHERE grade = 4
                 OR grade = 5)))
```
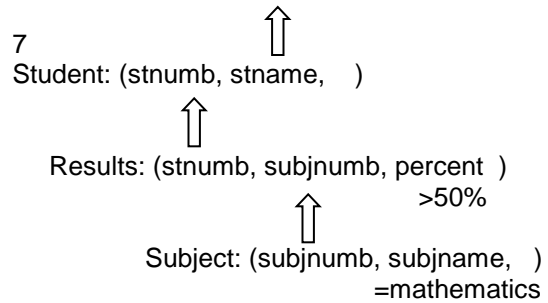
6

Student: (stnumb, stname,   ) ⇧

Results: (stnumb, subjnumb,) ⇧

Subject: (subjnumb, subname,   ) ⇧
                    =science

```
SELECT stname
FROM student
WHERE stnumb in
       (SELECT  stnumb
       FROM results
       WHERE subjnumb in
            (SELECT subjnumb
            FROM subject
            WHERE subjname = 'science'))
```
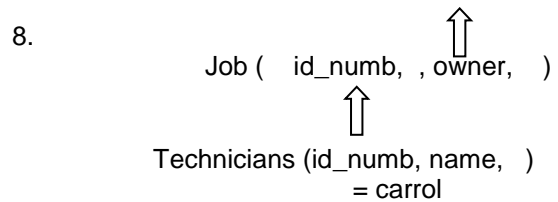
7

Student: (stnumb, stname,   ) ⇧

Results: (stnumb, subjnumb, percent) ⇧
                              >50%

Subject: (subjnumb, subjname,   ) ⇧
                =mathematics

```
SELECT stname
FROM student
WHERE stnumb in
     (SELECT  stnumb
     FROM results
     WHERE percent >.5
     AND subjnumb in
          (SELECT subjnumb
          FROM subject
          WHERE subjname = "mathematics"))
```

8.

Job (id_numb, , owner,   ) ⇧

Technicians (id_numb, name,   ) ⇧
                = carrol

```
SELECT owner
FROM job
WHERE id_numb in
       (SELECT id_numb
       FROM Technicians
       WHERE name ='carrol')
```

9.

Technicians (id_numb, name,   ) ⇧

Experience (id_numb, type,   qualification) ⇧
                        = Mac   =N

```
SELECT name
FROM technicians
WHERE id_numb in
       (SELECT id_numb
       FROM experience
       WHERE type  = 'Mac'
       AND qualification = 'N')
```

10

devices (type, rate,   ) ⇑

job (type, owner) ⇑
= Byrne

```
SELECT rate
FROM devices
WHERE type in
        (SELECT type
        FROM job
        WHERE owner  = 'Byrne')
```

11

job (type, owner,   ) ⇕

device (type, , priority) ⇑
= H

```
SELECT owner
FROM job
WHERE type in
        (SELECT type
        FROM devices
        WHERE priority  = 'H')
```

12

experience (id_numb, type, qualification) ⇑ ⇑

job (id_numb, type, owner)
= Franke

```
SELECT qualification
FROM experience
WHERE id_numb in
        (SELECT id_numb
        FROM job
        WHERE owner  = "Franke")
        AND type in
                (SELECT type
                FROM job
                WHERE owner = "Franke")
```

Note: this gives no result because the technician doing Franke's repairs does not have a qualification in 'Monitors'

Activity 7.4

1
```
SELECT stnumb, subjnumb, percent * 1.05
FROM results
```

2
```
SELECT stnumb, (NOW( ) - born) / 365
                                AS [Age in Years]
FROM student
```

3
```
SELECT stnumb, subjnumb, percent + 0.03
                                AS [New percent]
FROM results;
```

4
```
SELECT tname
FROM teacher
ORDER BY tname ASC
```

5
```
SELECT stname
FROM student
ORDER BY grade ASC, stname ASC
```

6
```
SELECT stnumb, percent
FROM results
WHERE subjnumb = '18'
ORDER BY percent DESC
```

7
```
SELECT stname
FROM student
WHERE grade = 6
ORDER BY born DESC
```

8
```
SELECT stnumb
FROM results
WHERE percent > 0.5
AND subjnumb in
        (SELECT subjnumb
        FROM subject
        WHERE subjname = 'mathematics')
ORDER BY percent DESC
```
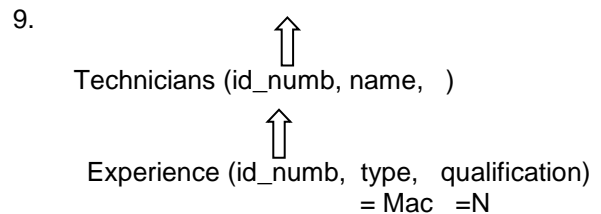
9
```
SELECT SUM(percent) AS [Total Marks]
FROM results
WHERE stnumb = '3765'
```

10
```
SELECT stnumb
FROM results
WHERE percent in
        (SELECT MIN(percent)
        FROM results)
```

11
```
SELECT COUNT(stnumb) AS [Number of students]
FROM student
WHERE grade = 7
```

12
SELECT COUNT(stnumb) AS [Number of students]
FROM results
WHERE percent > 0.5

13
SELECT stname
FROM student
WHERE born in
          (SELECT MAX(born)
          FROM student
          WHERE grade = 5)

14
SELECT COUNT(tname)
FROM teacher
WHERE grade = NULL

15
SELECT AVG(percent)
FROM results
WHERE stnumb in
          (SELECT stnumb
          FROM student
          WHERE grade = 4)
          AND subjnumb in
                    (SELECT subjnumb
                    FROM subject
                    WHERE subjname = 'science');

16
SELECT stname
FROM student
WHERE stnumb in
     (SELECT stnumb
     FROM results
     WHERE percent >
          (SELECT AVG(percent)
          FROM results
          WHERE subjnumb in
                    (SELECT subjnumb
                    FROM subject
                    WHERE subjname = 'social science')))

17
SELECT grade, COUNT(stname)
                         AS [Number of students]
FROM student
GROUP BY grade

18
SELECT subjnumb, COUNT(stnumb)
FROM results
GROUP BY subjnumb

19
SELECT subjnumb
FROM results
WHERE percent > 0.65
GROUP BY subjnumb
HAVING COUNT (stnumb) > 2

20
SELECT grade, COUNT(stnumb) AS [Total]
FROM student
GROUP BY grade
HAVING COUNT(stnumb) <= ALL
          (SELECT COUNT(stnumb)
          FROM student
          GROUP BY grade)

Activity 7.5
1
a   On what dates were low priority jobs accepted?

b   What type and rate of devices are being repaired by novices?

c   In which subjects were results better than 90% achieved?

d   In which rooms were results below 35%?

2
SELECT name
FROM technicians t, experience e
WHERE t.id_numb = e.id_numb
and e.type = 'Mac'
and e.qualification = 'E'4

3
SELECT grade
FROM technicians t, job j
WHERE t.id_numb = j.id_numb
and j.owner = 'James'

4
SELECT rate * time AS [Cost]
FROM devices d, job j
WHERE d.type = r.type
and j.owner = 'Elliott'

5
SELECT tname
FROM teacher t, student s
WHERE t.grade = s.grade
AND born = #25/01/01#

Note: For date queries some computers will use US coding i.e. mm/dd/yy instead of dd/mm/yy.

6
SELECT stname, s.grade, tname
FROM student s, teacher t
WHERE s.grade = t.grade
ORDER BY stname

7
SELECT room
FROM student st, subject su, teacher t, results r
WHERE su.tname = t.tname
AND su.subjnumb = r.subjnumb
AND r.stnumb = st.stnumb
AND subjname = 'science'
AND stname = 'Hunter,C'

8
SELECT subjname, stname
FROM student st, results r, subject su
WHERE st.stnumb = r.stnumb
AND su.subjnumb = r.subjnumb
ORDER BY subjname, stname

9
SELECT tname
FROM student st, results r, subject su
WHERE st.stnumb = r.stnumb
AND su.subjnumb = r.subjnumb
AND grade = 7
AND percent > 0.65

10
SELECT a.stnumb, b.stnumb
FROM results a, results b
WHERE a.stnumb <> b.stnumb
AND a.percent = b.percent
AND a.subjnumb = b.subjnumb

11
SELECT a.stnumb, a.percent
FROM results a, results b
WHERE a.stnumb = b.stnumb
AND a.percent = b.percent
AND a.subjnumb <> b.subjnumb
ORDER BY a.percent DESC

12
SELECT a.stnumb, s.stname, a.percent
FROM results a, results b, student s
WHERE a.stnumb = b.stnumb
AND a.percent = b.percent
AND a.subjnumb <> b.subjnumb
AND s.stnumb = a.stnumb
ORDER BY a.percent DESC

Activity 7.6
1.
SELECT *
FROM member

2.
SELECT [movie#]
FROM onhire

3.
SELECT movname, year
FROM movie

4.
SELECT distinct [member#]
FROM onhire

5.
SELECT country
FROM director
WHERE dirname = 'Lean, David'

6.
SELECT year
FROM movie
WHERE movname = 'Star Wars'

7.
SELECT memname, address
FROM member
WHERE [member#] = '5045'

8.
SELECT [member#], memname
FROM member
WHERE owes > 50

9.
SELECT dirname
FROM director
WHERE NOT country = 'US'

10.
SELECT [movie#], movname
FROM movie
WHERE length < 180

11.
SELECT [member#], memname
FROM member
WHERE owes IS NULL

12.
SELECT [movie#], movname
FROM movie
WHERE year BETWEEN 1970 AND 1979

13.
SELECT [movie#]
FROM onhire
WHERE [member#] = '5034'
AND duedate = #4/09/2000#

14.
SELECT [member#], memname
FROM member
WHERE owes BETWEEN 50 AND 100

15.
SELECT [movie#], movname
FROM movie
WHERE [dir#] = '107'
AND NOT length = 137

16.
SELECT [movie#], movname
FROM movie
WHERE length > 200
AND year < 1960

17.
SELECT [dir#], dirname
FROM director
WHERE country = 'US',
OR country = 'Canada'

18.
SELECT [dir#], dirname
FROM director
WHERE country IN ('England', 'German', 'France')

19.
SELECT [member#], memname
FROM member
WHERE memname LIKE 'F*'

20.
SELECT [member#], memname
FROM member
WHERE address LIKE '*St'

21.
SELECT [dir#], dirname
FROM director
WHERE dirname LIKE '*John'

22.
SELECT [movie#], movname
FROM movie
WHERE year > 1990
AND movname LIKE 'M*'

23.
SELECT country
FROM director
WHERE [dir#] IN
        (SELECT [dir#]
        FROM movie
        WHERE movname = 'Casablanca')

24.
SELECT memname, address
FROM member
WHERE [member#] IN
        (SELECT [member#]
        FROM onhire
        WHERE [movie#] = '1015')

25.
SELECT owes
FROM member
WHERE [member#] IN
        (SELECT [member#]
        FROM onhire
        WHERE duedate = #09/06/2000#)

26.
SELECT dirname
FROM director
WHERE [dir#] IN
        (SELECT [dir#]
        FROM movie
        WHERE movname = 'Glory')

27.
SELECT [movie#]
FROM onhire
WHERE [member#] IN
        (SELECT [member#]
        FROM member
        WHERE owes IS NULL)

28.
SELECT movname
FROM movie
WHERE [movie#] IN
        (SELECT [movie#]
        FROM onhire
        WHERE [member#] IN
                (SELECT [member#]
                FROM member
                WHERE memname = 'Miller,R'))

29.
SELECT address
FROM member
WHERE [member#] IN
    (SELECT [member#]
    FROM onhire
    WHERE [movie#] IN
        (SELECT [movie#]
        FROM movie
        WHERE movname = 'Full Metal Jacket'))

30.
SELECT [dir#], dirname
FROM director
WHERE [dir#] IN
        (SELECT [dir#]
        FROM movie
        WHERE [movie#] IN
                (SELECT [movie#]
                FROM onhire
                WHERE duedate = #12/09/2000#))

31.
SELECT memname, owes, owes * 1.1 AS [GST]
FROM member

32.
select movname, year, YEAR(NOW) - year AS
                                [Time since made]
from movie

33.
SELECT movname, length + 12 AS [Time]
FROM movie

34.
SELECT *, duedate - 2 AS [Revised due dates]
FROM onhire

35.
SELECT movname, length / 60 AS [Hours]
FROM movie

36.
SELECT [movie#], movname
FROM movie
ORDER BY movname ASC

37.
SELECT [movie#], movname, length
FROM movie
ORDER BY length DESC

38.
SELECT *
FROM director
ORDER BY country ASC, dirname ASC

39.
SELECT *
FROM movie
ORDER BY year ASC, length DESC

40.
SELECT [member#], memname, owing
FROM member
WHERE NOT owing IS NULL

41.
SELECT [movie#], movname
FROM movie
WHERE [movie#] IN
        (SELECT [movie#]
        FROM onhire
        ORDER BY [movie#] ASC)

42.
SELECT [movie#], movname
FROM movie
WHERE [movie#] IN
        (SELECT [movie#]
        FROM onhire
        WHERE duedate = #09/12/2000#)
ORDER BY year ASC

43.
SELECT SUM(owing) AS [Total owing]
FROM member

44.
SELECT AVG(length) AS [Average movie length]
FROM movie

45.
SELECT COUNT(*) AS [Count before 1980]
FROM movie
WHERE year < 1980

46.
SELECT COUNT(*) AS [Count owing money]
FROM member
WHERE NOT owing IS NULL

47.
SELECT movname
FROM movie
WHERE length IN
        (SELECT MAX(length)
        FROM movie)

48.
SELECT AVG(owing) AS [Average owing]
FROM member
WHERE NOT owing IS NULL

49.
SELECT [movie#], movname
FROM movie
WHERE length IN
    (SELECT MIN(length)
    FROM movie
    WHERE [dir#] IN
        (SELECT [dir#]
        FROM director
        WHERE dirname = 'Spielberg, Steven'))

50.
SELECT movname
FROM movie
WHERE [movie#] IN
        (SELECT [movie#]
        FROM onhire
        WHERE [member#] IN
                (SELECT [member#]
                FROM member
                WHERE owing IN
                        (SELECT MAX(owing)
                        FROM member)))

51.
SELECT [member#]
FROM member
WHERE owing >
        (SELECT AVG(owing)
        FROM member)

52.
SELECT duedate, COUNT(*) AS [Number due]
FROM onhire
GROUP BY duedate

53.
SELECT country, COUNT(*) AS [Number]
FROM director
GROUP BY country

54.
SELECT year, COUNT(year) AS [Number]
FROM movie
GROUP BY year
HAVING COUNT(year) >= ALL
        (SELECT COUNT(year)
        FROM movie
        GROUP BY year
        ORDER BY COUNT(year) DESC)

55.
SELECT memname, owes
FROM member m, onhire o
WHERE m.[member#] = o.[member#]
ORDER BY owes DESC

56.
SELECT dirname, [movie#], year
FROM director d, movie m
WHERE d.[dir#] = m.[dir#]
AND (year = 1986
    OR year = 1987)

57.
SELECT memname, address, duedate
FROM member m, onhire o
WHERE m.[member#] = o.[member#]
AND duedate <= #09/08/2000#

58.
SELECT memname, movname, duedate
FROM movie v, member m, onhire o
WHERE v.[movie#] = o.[movie#]
AND o.[member#] = m.[member#]
AND movname = 'Zulu'

59.
SELECTdirname, movname, memname
FROM director d, movie v, member m, onhire o
WHERE d.[dir#] = v.[dir#]
AND v.[movie#] = o.[movie#]
AND o.[member#] = m.[member#]
AND memname = 'Austin,L'

60.
SELECT a.length, a.movname, a.[dir#], b.length,
                        b.movname, b.[dir#]
FROM movie a, movie b
WHERE a.length = b.length
AND a.[dir#] = b.[dir#]
AND a.[movie#] <> b.[movie#]

61.
SELECT movname, memname, duedate
FROM movie v, member m, onhire o, onhire p
WHERE v.[movie#] = o.[movie#]
AND o.[member#] = m.[member#]
AND o.duedate = p.duedate
AND o.[member#] = p.[member#]
AND o.[movie#] <> p.[movie#]