

```
SQL> start query1-18
SQL> select B#, first_name || ' ' || last_name as name
2   from students where gpa > 3.5 and deptname = 'CS'
3   /
```

```
B#    NAME
-----
```

```
B003 Tracy Wang
B007 Becky Lee
B010 Sata Patel
B011 Art Chang
```

```
SQL> start query2-18
SQL> column "birth date" format a10
SQL>
SQL> select t.B#, first_name, last_name, bdate as "birth date"
2   from tas t, students s where s.deptname = 'CS' and
3   t.B# = s.B#
4   /
```

B#	FIRST_NAME	LAST_NAME	birth date
B005	Jack	Smith	18-OCT-91
B010	Sata	Patel	12-OCT-90
B011	Art	Chang	08-JUN-89

```
SQL> start query3-18
SQL> column classid format a7
SQL>
SQL> select classid, dept_code || course# as course_id,
2   first_name || ' ' || last_name as name, email
3   from classes, tas t, students s
4   where ta_level = 'PhD' and ta_B# = t.B#
5   and t.B# = s.B#;
```

CLASSID	COURSE_ID	NAME
c0006	CS532	Art Chang
chang@bu.edu		
c0002	Math314	Tara Ramesh
ramesh@bu.edu		

```
SQL>
SQL> start query4-18
SQL> select B#, first_name, last_name, gpa
2   from students where B# in (select B#
3   from enrollments e1, classes c1
4   where e1.classid = c1.classid and c1.dept_code = 'CS')
5   and B# in (select B#
6   from enrollments e2, classes c2
7   where e2.classid = c2.classid and c2.dept_code = 'Math');
```

B#	FIRST_NAME	LAST_NAME	GPA
B001	Anne	Broder	3.17

```

SQL>
SQL>
SQL>
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SQL>
SQL>
SQL>
SQL> start query5a-18
SQL> select B#, first_name, last_name from students
  2 where B# in (select B# from enrollments) and
  3 B# not in (select B# from enrollments
  4 where lgrade = 'A');

```

B#	FIRST_NAME	LAST_NAME
B004	Barbara	Callan
B002	Terry	Buttler
B005	Jack	Smith

```

SQL>
SQL> start query5b-18
SQL> select B#, first_name, last_name from students s
  2 where B# in (select B# from enrollments) and
  3 not exists (select * from enrollments
  4 where B# = s.B# and lgrade = 'A');

```

B#	FIRST_NAME	LAST_NAME
B004	Barbara	Callan
B002	Terry	Buttler
B005	Jack	Smith

```

SQL>
SQL> start query6-18
SQL> select B#, first_name, last_name from students s
  2 where B# in (select B# from enrollments) and
  3 not exists (select * from enrollments
  4 where B# = s.B# and lgrade <> 'A' and lgrade is not null);

```

B#	FIRST_NAME	LAST_NAME
B006	Terry	Zillman
B007	Becky	Lee

```

SQL>
SQL> start query6b-18
SQL> select B#, first_name, last_name
  2 from students where B# in
  3 (select B# from enrollments group by B#
  4 having max(lgrade) = 'A');

```

B#	FIRST_NAME	LAST_NAME
B007	Becky	Lee
B006	Terry	Zillman

```

SQL>

```

```

SQL> column dept_code format a9
SQL> start query7-18
SQL> select classid, dept_code, course#, limit - class_size as seats_available
  2  from classes where course# < 500 and year = 2017 and
  3  semester = 'Spring';

```

CLASSID	DEPT_CODE	COURSE#	SEATS_AVAILABLE
c0005	CS	240	1
c0001	CS	432	1
c0007	Math	221	0

```

SQL>
SQL> start query8-18
SQL> select B#, sum(credits)
  2  from enrollments e, classes c, course_credit cc
  3  where e.classid = c.classid and c.course# = cc.course#
  4  group by B#;

```

B#	SUM(CREDITS)
B003	12
B007	4
B002	4
B004	8
B005	3
B006	3
B001	23

7 rows selected.

```

SQL>
SQL> start query9-18
SQL> select dept_code, course# from classes
  2  group by dept_code, course# having sum(class_size) =
  3  (select max(sum(class_size)) from classes group by dept_code, course#);

```

DEPT_CODE	COURSE#
CS	432

```

SQL>
SQL> start query10-18
SQL> select s.B#, first_name, last_name, count(*)
  2  from students s, enrollments e
  3  where s.B# = e.B#
  4  group by s.B#, first_name, last_name
  5  having count(*) >= 2;

```

B#	FIRST_NAME	LAST_NAME	COUNT(*)
B001	Anne	Broder	6
B003	Tracy	Wang	3
B004	Barbara	Callan	2

```

SQL>
SQL> start query11-18
SQL> select classid, dept_code, course# from classes c where not exists

```

```

2 (select * from students s where status = 'junior' and not exists
3 (select * from enrollments e where c.classid = e.classid and e.B# = s.B#));

```

CLASSID	DEPT_CODE	COURSE#
c0005	CS	240
c0004	CS	432

SQL>

SQL> start query12-18

```

SQL> select B#, first_name, last_name from students s where not exists
2 (select * from classes c where c.dept_code = 'CS' and
3 year = 2017 and semester = 'Spring' and not exists
4 (select * from enrollments e
5 where s.B# = e.B# and e.classid = c.classid));

```

B#	FIRST_NAME	LAST_NAME
B001	Anne	Broder

SQL>

SQL> start query13-18

```

SQL> select B#, first_name, last_name from students s
2 where exists (select * from enrollments e, classes c
3 where s.B# = e.B# and e.classid = c.classid and s.deptname <> c.dept_code);

```

B#	FIRST_NAME	LAST_NAME
B001	Anne	Broder
B004	Barbara	Callan
B006	Terry	Zillman
B007	Becky	Lee

SQL>

SQL> start query14-18

```

SQL> select B#, first_name, last_name from students s
2 where B# in (select B# from enrollments) and (B#, first_name, last_name) not in
3 (select B#, first_name, last_name from students s
4 where exists (select * from enrollments e, classes c
5 where s.B# = e.B# and e.classid = c.classid and s.deptname <> c.dept_code));

```

B#	FIRST_NAME	LAST_NAME
B002	Terry	Buttler
B003	Tracy	Wang
B005	Jack	Smith

SQL>

SQL> start query15-18

```

SQL> select c.dept_code, c.course#, c.title,
2 nvl(e.lgrade, 'grade missing') as grade
3 from courses c, classes c1, enrollments e where c.dept_code = c1.dept_code
4 and c.course# = c1.course# and e.B# = 'B003' and c1.classid = e.classid;

```

DEPT_CODE	COURSE#	TITLE	GRADE
CS	432	database systems	I
CS	432	database systems	A

```
SQL>
SQL> start query16-18
SQL> select c.dept_code, c.course#, c.title from courses c, classes c1
  2 where c.title like '%systems%' and c.dept_code = c1.dept_code
  3 and c.course# = c1.course# and not exists
  4 (select * from students s where s.gpa = 4.0 and not exists
  5 (select * from enrollments e where e.B# = s.B# and e.classid = c1.classid));
```

no rows selected

```
SQL>
SQL> column classid format a7
SQL> column lgrade format a6
SQL> start query17-18
SQL> select B#, classid, lgrade, decode(lgrade, 'A', 4, 'A-', 3.7, 'B+',
  2 3.3, 'B', 3, 'B-', 2.7, 'C+', 2.3, 'C', 2, 'C-', 1.7, 'D', 1) ngrade
  3 from enrollments where lgrade is not null and lgrade <> 'I'
  4 order by ngrade desc;
```

B#	CLASSID	LGRADE	NGRADE
B001	c0001	A	4
B006	c0006	A	4
B001	c0004	A	4
B007	c0007	A	4
B003	c0004	A	4
B004	c0005	B+	3.3
B005	c0006	B	3
B001	c0005	B	3
B001	c0003	B	3
B002	c0002	B	3
B001	c0006	B-	2.7
B001	c0002	C+	2.3
B004	c0004	C	2

13 rows selected.

```
SQL>
SQL> start query18-18
SQL> select B#, first_name, last_name from students where B# in
  2 (select e.B# from enrollments e, classes c
  3 where e.classid = c.classid and (dept_code, course#) in
  4 (select c1.dept_code, c1.course# from classes c1, enrollments e1
  5 where e1.B# = 'B005' and c1.classid = e1.classid));
```

B#	FIRST_NAME	LAST_NAME
B005	Jack	Smith
B006	Terry	Zillman
B001	Anne	Broder

```
SQL>
SQL> start query18a-18
SQL> select B#, first_name, last_name from students s where exists
  2 (select e.* from enrollments e, classes c
  3 where s.B# = e.B# and e.classid = c.classid and exists
```

```

4 (select c1.* from classes c1, enrollments e1
5 where c.dept_code = c1.dept_code and c.course# = c1.course#
6 and e1.B# = 'B005' and c1.classid = e1.classid));

```

B#	FIRST_NAME	LAST_NAME
B005	Jack	Smith
B006	Terry	Zillman
B001	Anne	Broder

SQL>

SQL> start query19-18

```

SQL> select avg(temp.totalcredits) from (select e.B#, sum(cc.credits) totalcredits
2 from enrollments e, courses c, course_credit cc, classes c1
3 where e.classid = c1.classid and c.course# = cc.course# and
4 c.dept_code = c1.dept_code and c.course# = c1.course#
5 and lgrade is not null group by e.B#) temp;

```

AVG(TEMP.TOTALCREDITS)

```

-----
7.57142857

```

SQL>

SQL> column deptname format a8

SQL> start query20-18

SQL>

```

SQL> select deptname, avg(temp.totalcredits) average_total_credits
2 from students s, (select e.B#, sum(cc.credits) totalcredits
3 from enrollments e, courses c, course_credit cc, classes c1
4 where e.classid = c1.classid and c.course# = cc.course# and
5 c.dept_code = c1.dept_code and c.course# = c1.course# and lgrade is not null
6 group by e.B#) temp where s.B# = temp.B# group by deptname;

```

DEPTNAME	AVERAGE_TOTAL_CREDITS
Biol	3
CS	9.5
Math	6

```

-----
Biol          3
CS            9.5
Math          6

```

SQL>

SQL> spool off