1. SQL Queries

1. Query 1

```
SQL> @u1
SQL> run
  1* select d.dname, count(*) from Department d left join Student
     s on  d.dno =     s.majorDept or    d.dno =     minorDept
group by    dname

DNAME                          COUNT(*)
------------------------------ ----------
Computer Science                        4
Information Technology                  1
Pharmacy                                4
```

2. Query 2

```
SQL> @u2
SQL> run
  1  select d.dname, wf.facSSN     as    ssn,  count(s.sno)     as
     NoOfcourses from  Department  d left      join Works_For wf on
     d.dno =     wf.deptNo
  2* left   join  Section     s on  wf.facSSN   =     s.instructor
group by    d.dname, wf.facSSN     order by    d.dname     asc

DNAME                          SSN        NOOFCOURSES
------------------------------ ---------- -----------
Computer Science               765439876            4
Computer Science               875435123            1
Information Technology         875676767            1
Pharmacy                       865361231            0
```

3. Query 3

```
SQL> @u3
SQL> run
  1  select d.dname, c.cno, c.cname from Department d
  2* left   join  Course      c on  d.dno =     c.deptNo group    by
     d.dname, c.cno, c.cname order      by    d.dname     asc

DNAME                          CNO
------------------------------ ----------
CNAME
--------------------------------------------------
Computer Science               CS1
Database

Computer Science               CS2
Computer Networking

Information Technology         CS3
Operating Systems


DNAME                          CNO
------------------------------ ----------
CNAME
```

```
--------------------------------------------------
Information Technology         CS4
Computer Architecture

Information Technology         CS5
Data Strucutures

Pharmacy



6 rows selected.
```

4. Query 4

```
SQL> @u4
SQL> run
  1  select c.cno,     p.precno   from  Course     c
  2  left   join  Course_Prerequisite    p on  c.cno =  p.cno  group
      by    c.cno,     p.precno
  3* order  by    c.cno asc

CNO        PRECNO
---------- ----------
CS1        CS3
CS2        CS4
CS3
CS4
CS5
```

5. Query 5

```
SQL> @u5
SQL> run
  1  select d.dname,   count(distinct   wf.facSSN)   as   prof_ct,
      count(load)/count(distinct   wf.facSSN) as    avgLoad   from
      Department  d
  2  left   join (select     deptNo, facSSN from Works_For)    wf
      on    wf. deptNo  =     d.dno left  join
  3* (select     count(*) as load,  instructor  from  Section  group
      by instructor)   t on  wf.facSSN   =     t.instructor   group
      by    d.dname

DNAME                           PROF_CT    AVGLOAD
------------------------------ ---------- ----------
Information Technology                  1          1
Pharmacy                                1          0
Computer Science                        2          1
```

6. Query 6

```
SQL> @u6
SQL> run
  1  select d.dname as  stu_ct,    sum(t2.credits)  as    tl_cr,
      sum(t2.credits)/count(distinct t1.ssn) as avg_cr
  2  from Department   d,(select   ssn,  majorDept,  minorDept  from
      Student) t1,(select    c.credits,  t.stuSSN   as    ssn  from
```

```
      Transcript t,    Course     c     where t.courseNo =  c.cno)
      t2
  3* where (t1.majorDept=d.dno    or    t1.minorDept=d.dno)    and
      (t2.ssn=t1.ssn)  group by d.dname

STU_CT                          TL_CR     AVG_CR
------------------------------ ---------- ----------
Information Technology                  3          3
Pharmacy                                9          3
Computer Science                        9          3
```

7. Query 7

```
SQL> @u7
SQL> run
  1  select f.ssn,      stu.studentNo    from    Faculty    f    left
      join Section s on f.ssn      = s.instructor left    join
  Grade_Report g
  2  on s.sno    =     g.sno and   s.semester  =     g.semester  and
      s.year     =     g.year     and   s.courseNo  =
      g.courseNo left  join Student stu on    stu.ssn     =
      stuSSN
  3* group  by    f.ssn,     stu.studentNo order    by    f.ssn asc

SSN        STUDENTNO
---------- ----------
765439876  SN203
765439876  SN204
765439876  SN205
765439876
865361231
875435123  SN202
875676767

7 rows selected.
```

8. Query 8

```
SQL> @u8
SQL> run
  1  select f.ssn,      d.dname     from  Faculty     f     left
      join  Department  d
  2  on    exists      ((select    cno   from  Course      where
      deptNo      =     d.dno)      intersect
  3  (select     courseNo    from Section s    where s.instructor
      =     f.ssn))
  4* group  by    f.ssn,     d.dname     order by    f.ssn asc

SSN        DNAME
---------- ------------------------------
765439876  Computer Science
765439876  Information Technology
865361231
875435123  Information Technology
875676767  Computer Science
```

9. Query 9

```
SQL> @u9
SQL> run
  1  select d.dname, f.ssn from    Department d     left     join
     Works_For wf
  2  on     d.dno =     wf.deptNo
  3  left   join  Faculty     f
  4  on     wf.facSSN   =     f.ssn
  5  left   join  Salary_Scale     ss
  6  on     f.rank      =     ss.rank     and   f.empType   =
     ss.empType  where (select     count(*)    from  Section
     where instructor  =     f.ssn)      >     2
  7* and    ss.salary   <     (select     avg(sal.salary)  from
     Faculty     fac,  Salary_Scale     sal,  Works_For         wf
     where fac.rank    =     sal.rank    and   fac.empType =
sal.empType and   wf.facSSN   =     fac.ssn     and   wf.deptNo   =
     d.dno) group by  d.dname, f.ssn

no rows selected
```

10. Query 10

```
SQL> @u10
SQL> run
  1  select ssn, count(stuSSN)     from Faculty
  2* left join Grad_Student on     ssn   =     facSSN     group  by
     ssn

SSN        COUNT(STUSSN)
---------- -------------
765439876              2
865361231              0
875435123              1
875676767              2
```

11. Query 11

```
SQL> @u11
SQL> run
  1  select dname,      count(*) from    Department  inner join
Student     on    dno   =     majorDept   or    dno   =
     minorDept group  by    dname
  2* having count(*)    >     (select     avg(count)  from  (select
     count(*) as count from Department  inner join  Student     on
     dno   =     majorDept or     dno   =     minorDept group  by
     dno))

DNAME                          COUNT(*)
------------------------------ ----------
Computer Science                        4
Pharmacy                                4
```

12. Query 12

```
SQL> @u12
SQL> run
```

```
  1  select d.dname,    sum(s.salary)    as    avg_salary      from
     Department  d
  2  inner  join  Works_For   wf on d.dno =     wf.deptNo inner join
     Faculty     f
  3  on     wf.facSSN   =     f.ssn inner join  Salary_Scale   s   on
     f.rank      =     s.rank      and   f.empType   =
     s.empType group   by    d.dname
  4  having sum(s.salary)     >     (select     avg(avg_salary)
     from   (select     d.dname,    sum(s.salary)     as
     avg_salary  from  Department  d
  5  inner  join  Works_For   wf    on    d.dno =     wf.deptNo
     inner join  faculty     f on  wf.facSSN   =     f.ssn inner
     join  Salary_Scale      s
  6* on     f.rank      =     s.rank      and   f.empType   =
     s.empType   group by    d.dname))

no rows selected
```

13. Query 13

```
SQL> @u13
SQL> run
  1  select d.dname, wf.facSSN,    count(g.facSSN)  as  count  from
     Department  d left      join Works_For wfon    d.dno =
     wf.deptNo
  2  inner  join  (Grad_Student     g     inner join  Student   s   on
     g.stuSSN    =     s.ssn and   s.degreeProg      =     'PHD')
     on     wf.facSSN   =     g.facSSN group   by    d.dname,
     wf.facSSN,  d.dno
  3  having count(g.facSSN)   >     (select     avg(phd_count)   from
     (select     count(*)    as    phd_count
  4* from   Works_For   wf1,  Grad_Student      gs,   Student     stu
     where wf1.deptNo  =     d.dno and   wf1.facSSN  =
     gs.facSSN and    gs.stuSSN   =     stu.ssn          and
     stu.degreeProg='PHD')) order by    d.dname     asc

no rows selected
```

14. Query 14

```
SQL> @u14
SQL> run
  1  select s.ssn from  Student     s where     not  exists  ((select
     distinct c.cno
  2  from   Course      c,    Course_Prerequisite    p         where
     c.deptNo=s.majorDept and
  3* c.cno  =     p.precno)   minus (select    courseNo    from
     Transcript  where stuSSN      =     s.ssn))

SSN
----------
975164333
743678246
952561853
942567194
864169257
```

15. Query 15

```
SQL> @u15
SQL> run
  1  select stu.ssn     from Student stu where not   exists
  2  ((select    s.courseNo from  Person     p,  Section  s  where
      p.ssn =     s.instructor and p.lastname  =     'Smith')
  3* minus (select     courseNo    from  Transcript  where stuSSN
      =     stu.ssn))

no rows selected
```

16. Query 16

```
SQL> @u16
SQL> run
  1  select distinct    stu.ssn
  2  from   Student     stu,  Transcript  t
  3  where  stu.ssn     =     t.stuSSN    and  not  exists  ((select
      courseNo    from
  4  Transcript  where  stuSSN=stu.ssn)  minus  (select  s.courseNo
       from
  5* Person p,    Section     s where     p.ssn =     s.instructor
      and   p.lastName  =     'Smith'))

SSN
----------
743678246
864169257
942567194
952561853
```

17. Query 17

```
SQL> @u17
SQL> run
  1  select stu.ssn     from  Student     stu   where not   exists
  2  ((select    t.courseNo  from  Person p, Transcript   t where
  3  p.ssn  =     t.stuSSN    and   p.firstName =     'Shaival')
  4* minus (select     courseNo    from  Transcript  where stuSSN
      =     stu.ssn))


SSN
----------
743678246
864169257
942567194
952561853
975164333
```

18. Query 18

```
SQL> @u18
SQL> run
  1  select stu.ssn     from  Student     stu   where not   exists
```

```
  2  ((select courseNO from Study_Plan  where stuSSN     =
     stu.ssn) minus
  3* (select     courseNo    from Transcript  where stuSSN       =
     stu.ssn    and   grade in    ('A', 'A-', 'B+', 'B',  'B-',
     'C+')))

SSN
----------
864169257
975164333
```

19. Query 19

```
SQL> @u19
SQL> run
  1  select stu.ssn     from Student     stu   where not   exists
  2  ((select courseNo from Study_Plan where  stuSSN     =
     stu.ssn) minus
  3* (select     courseNo    from  Transcript  where stuSSN     =
     stu.ssn))

SSN
----------
864169257
975164333

SQL> spool off
```