EMPLOYEE TABLE

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		30
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7788	SCOTT	ANALYST	7566	19-APR-87	3000		20
7839	KING	PRESIDENT		17-NOV-81	5000		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
7876	ADAMS	CLERK	7788	23-MAY-87	1100		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7902	FORD	ANALYST	7566	03-DEC-81	3000		20
7934	MILLER	CLERK	7782	23-JAN-82	1300		10

DEPARTMENT TABLE

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

Use SELECT, WHERE, ORDER BY, GROUP BY

```
SQL> select ename,job,sal
  2  from emp
  3  where sal>2000
  4  order by sal desc;

ENAME      JOB              SAL
---------- --------- ----------
KING       PRESIDENT        5000
FORD       ANALYST          3000
SCOTT      ANALYST          3000
JONES      MANAGER          2975
BLAKE      MANAGER          2850
CLARK      MANAGER          2450
```

Use JOINS (INNER, LEFT, RIGHT)

```
SQL> SELECT e.ENAME, e.JOB, d.DNAME, d.LOC
  2  FROM emp e
  3  INNER JOIN dept d ON e.DEPTNO = d.DEPTNO;

ENAME      JOB       DNAME          LOC
---------- --------- -------------- -------------
SMITH      CLERK     RESEARCH       DALLAS
ALLEN      SALESMAN  SALES          CHICAGO
WARD       SALESMAN  SALES          CHICAGO
JONES      MANAGER   RESEARCH       DALLAS
MARTIN     SALESMAN  SALES          CHICAGO
BLAKE      MANAGER   SALES          CHICAGO
CLARK      MANAGER   ACCOUNTING     NEW YORK
SCOTT      ANALYST   RESEARCH       DALLAS
KING       PRESIDENT ACCOUNTING     NEW YORK
TURNER     SALESMAN  SALES          CHICAGO
ADAMS      CLERK     RESEARCH       DALLAS
JAMES      CLERK     SALES          CHICAGO
FORD       ANALYST   RESEARCH       DALLAS
MILLER     CLERK     ACCOUNTING     NEW YORK
```

Write subqueries

```
SQL> SELECT e.ENAME, d.DNAME
  2  FROM emp e
  3  LEFT JOIN dept d ON e.DEPTNO = d.DEPTNO;

ENAME      DNAME
---------- --------------
SMITH      RESEARCH
ALLEN      SALES
WARD       SALES
JONES      RESEARCH
MARTIN     SALES
BLAKE      SALES
CLARK      ACCOUNTING
SCOTT      RESEARCH
KING       ACCOUNTING
TURNER     SALES
ADAMS      RESEARCH
JAMES      SALES
FORD       RESEARCH
MILLER     ACCOUNTING
```

Use aggregate functions (SUM, AVG)

```
SQL> SELECT DEPTNO, COUNT(*) AS NumEmployees, AVG(SAL) AS AvgSalary, SUM(COMM) AS TotalCommission
  2  FROM emp
  3  GROUP BY DEPTNO;

    DEPTNO NUMEMPLOYEES  AVGSALARY TOTALCOMMISSION
---------- ------------ ---------- ---------------
        30            6 1566.66667            2200
        20            5       2175
        10            3 2916.66667
```

Optimize queries with index

```
SQL> CREATE INDEX idx_deptno ON emp(DEPTNO);

Index created.

SQL> CREATE INDEX idx_sal ON emp(SAL);

Index created.
```

```
SQL> SELECT ENAME, SAL, DEPTNO
  2  FROM emp e
  3  WHERE SAL > (
  4       SELECT AVG(SAL)
  5       FROM emp
  6       WHERE DEPTNO = e.DEPTNO
  7  );

ENAME                SAL     DEPTNO
---------- ---------- ----------
ALLEN              1600         30
JONES              2975         20
BLAKE              2850         30
SCOTT              3000         20
KING               5000         10
FORD               3000         20
```

```
SQL> SELECT DEPTNO, COUNT(*) AS NumEmployees, AVG(SAL) AS AvgSalary, SUM(COMM) AS TotalCommission
  2  FROM emp
  3  GROUP BY DEPTNO;

    DEPTNO NUMEMPLOYEES  AVGSALARY TOTALCOMMISSION
---------- ------------ ---------- ---------------
        30            6 1566.66667            2200
        20            5       2175
        10            3 2916.66667
```

```
SQL> SELECT e.ENAME, d.DNAME
  2  FROM emp e
  3  RIGHT JOIN dept d ON e.DEPTNO = d.DEPTNO;

ENAME      DNAME
---------- --------------
CLARK      ACCOUNTING
KING       ACCOUNTING
MILLER     ACCOUNTING
JONES      RESEARCH
FORD       RESEARCH
ADAMS      RESEARCH
SMITH      RESEARCH
SCOTT      RESEARCH
WARD       SALES
TURNER     SALES
ALLEN      SALES
JAMES      SALES
BLAKE      SALES
MARTIN     SALES
           OPERATIONS
```