Practical Assignment 4: Perform the following SQL queries on the database
created in Assignment 1.
Implementation of relational operators in SQL
 Boolean operators and pattern matching
 Arithmetic operations and built in functions
 Group functions
 Processing Date and Time functions
 Complex queries and set operators


```
mysql> use COMPANY
Database changed
mysql> select * from emp;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
+-------+--------+-----------+------+------------+------+------+--------+
12 rows in set (0.00 sec)

mysql> select count(*),avg(sal),deptno from emp where deptno=20;
+----------+-----------+--------+
| count(*) | avg(sal)  | deptno |
+----------+-----------+--------+
|        5 | 1795.0000 |     20 |
+----------+-----------+--------+
1 row in set (0.01 sec)

mysql> select ename,sal,((sal*10)/100) as PF from emp;
+--------+------+----------+
| ename  | sal  | PF       |
+--------+------+----------+
| Smith  |  800 |  80.0000 |
| Allen  | 1600 | 160.0000 |
| Ward   | 1250 | 125.0000 |
| Jones  | 2975 | 297.5000 |
| Martin | 1250 | 125.0000 |
| Blake  | 2850 | 285.0000 |
| Clark  | 2450 | 245.0000 |
| Scott  | 3000 | 300.0000 |
| King   | 5000 | 500.0000 |
| Turner | 1500 | 150.0000 |
| Adams  | 1100 | 110.0000 |
| Adams  | 1100 | 110.0000 |
+--------+------+----------+
12 rows in set (0.01 sec)
```

```
mysql> select ename from emp where (1995-year(hiredate) >= 14) ;
Empty set (0.01 sec)

mysql> select * from emp order by sal;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
+-------+--------+-----------+------+------------+------+------+--------+
12 rows in set (0.00 sec)

mysql> select * from emp order by sal desc;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
+-------+--------+-----------+------+------------+------+------+--------+
12 rows in set (0.00 sec)

mysql> select * from emp;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
+-------+--------+-----------+------+------------+------+------+--------+
```

```
12 rows in set (0.00 sec)

mysql> select ename,sal,((sal*10)/100) as PF,((sal*50)/100) as
HRA,((sal*30)/100) as DA,(sal+
    ((sal*10)/100)+((sal*50)/100)+((sal*30)/100)) as Gross from emp order
by Gross;
+--------+------+----------+-----------+-----------+-----------+
| ename  | sal  | PF       | HRA       | DA        | Gross     |
+--------+------+----------+-----------+-----------+-----------+
| Smith  |  800 |  80.0000 |  400.0000 |  240.0000 | 1520.0000 |
| Adams  | 1100 | 110.0000 |  550.0000 |  330.0000 | 2090.0000 |
| Adams  | 1100 | 110.0000 |  550.0000 |  330.0000 | 2090.0000 |
| Ward   | 1250 | 125.0000 |  625.0000 |  375.0000 | 2375.0000 |
| Martin | 1250 | 125.0000 |  625.0000 |  375.0000 | 2375.0000 |
| Turner | 1500 | 150.0000 |  750.0000 |  450.0000 | 2850.0000 |
| Allen  | 1600 | 160.0000 |  800.0000 |  480.0000 | 3040.0000 |
| Clark  | 2450 | 245.0000 | 1225.0000 |  735.0000 | 4655.0000 |
| Blake  | 2850 | 285.0000 | 1425.0000 |  855.0000 | 5415.0000 |
| Jones  | 2975 | 297.5000 | 1487.5000 |  892.5000 | 5652.5000 |
| Scott  | 3000 | 300.0000 | 1500.0000 |  900.0000 | 5700.0000 |
| King   | 5000 | 500.0000 | 2500.0000 | 1500.0000 | 9500.0000 |
+--------+------+----------+-----------+-----------+-----------+
12 rows in set (0.00 sec)

mysql> select count(*),deptno from emp group by deptno;
+----------+--------+
| count(*) | deptno |
+----------+--------+
|        5 |     20 |
|        5 |     30 |
|        2 |     10 |
+----------+--------+
3 rows in set (0.00 sec)

mysql> select deptno,sum(sal) as Total_Sal_Payable from emp group by
deptno;
+--------+-------------------+
| deptno | Total_Sal_Payable |
+--------+-------------------+
|     20 |              8975 |
|     30 |              8450 |
|     10 |              7450 |
+--------+-------------------+
3 rows in set (0.00 sec)

mysql> select job as Job,count(empno) as Num_Of_Emp from emp group by job
order by count(empno) desc;
+-----------+------------+
| Job       | Num_Of_Emp |
+-----------+------------+
| Salesman  |          4 |
| Clerk     |          3 |
| Manager   |          3 |
| Analyst   |          1 |
| President |          1 |
+-----------+------------+
5 rows in set (0.01 sec)
```

```
mysql> select * from emp;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
+-------+--------+-----------+------+------------+------+------+--------+
12 rows in set (0.00 sec)

mysql> select job as Job,sum(sal) as Total,max(sal) as Max,min(sal) as
Min,avg(sal) as Average
    from emp group by job;
+-----------+-------+------+------+-----------+
| Job       | Total | Max  | Min  | Average   |
+-----------+-------+------+------+-----------+
| Clerk     |  3000 | 1100 |  800 | 1000.0000 |
| Salesman  |  5600 | 1600 | 1250 | 1400.0000 |
| Manager   |  8275 | 2975 | 2450 | 2758.3333 |
| Analyst   |  3000 | 3000 | 3000 | 3000.0000 |
| President |  5000 | 5000 | 5000 | 5000.0000 |
+-----------+-------+------+------+-----------+
5 rows in set (0.01 sec)

mysql> select deptno,sum(sal),max(sal),min(sal),avg(sal) from emp where
deptno = 20;
+--------+----------+----------+----------+-----------+
| deptno | sum(sal) | max(sal) | min(sal) | avg(sal)  |
+--------+----------+----------+----------+-----------+
|     20 |     8975 |     3000 |      800 | 1795.0000 |
+--------+----------+----------+----------+-----------+
1 row in set (0.00 sec)

mysql> select job as Job,sum(sal) as Total,max(sal) as Max,min(sal) as
Min,avg(sal) as
    Average,deptno as Dept from emp where deptno=20 group by job having
avg(sal)>1000;
+---------+-------+------+------+-----------+------+
| Job     | Total | Max  | Min  | Average   | Dept |
+---------+-------+------+------+-----------+------+
| Manager |  2975 | 2975 | 2975 | 2975.0000 |   20 |
| Analyst |  3000 | 3000 | 3000 | 3000.0000 |   20 |
+---------+-------+------+------+-----------+------+
2 rows in set (0.00 sec)

mysql> select * from emp;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
```

```
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
+-------+--------+-----------+------+------------+------+------+--------+
12 rows in set (0.00 sec)

mysql> select max(sal) from emp where job='Salesman';
+----------+
| max(sal) |
+----------+
|     1600 |
+----------+
1 row in set (0.00 sec)

mysql> select count(*) from emp;
+----------+
| count(*) |
+----------+
|       12 |
+----------+
1 row in set (0.01 sec)

mysql> select count(distinct(job)) from emp;
+----------------------+
| count(distinct(job)) |
+----------------------+
|                    5 |
+----------------------+
1 row in set (0.00 sec)

mysql> select sum(sal) from emp;
+----------+
| sum(sal) |
+----------+
|    24875 |
+----------+
1 row in set (0.00 sec)

mysql> select max(sal),min(sal),avg(sal) from emp;
+----------+----------+-----------+
| max(sal) | min(sal) | avg(sal)  |
+----------+----------+-----------+
|     5000 |      800 | 2072.9167 |
+----------+----------+-----------+
1 row in set (0.00 sec)

mysql> select * from emp;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
```

```
+-------+--------+-----------+------+------------+------+------+--------+
|  7369 | Smith  | Clerk     | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7499 | Allen  | Salesman  | 7698 | 2011-02-20 | 1600 |  300 |     30 |
|  7521 | Ward   | Salesman  | 7698 | 2011-02-22 | 1250 |  500 |     30 |
|  7566 | Jones  | Manager   | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7654 | Martin | Salesman  | 7698 | 2011-09-28 | 1250 | 1400 |     30 |
|  7698 | Blake  | Manager   | 7838 | 2011-05-01 | 2850 | NULL |     30 |
|  7782 | Clark  | Manager   | 7838 | 2011-06-09 | 2450 | NULL |     10 |
|  7788 | Scott  | Analyst   | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7839 | King   | President | NULL | 2011-11-17 | 5000 | NULL |     10 |
|  7844 | Turner | Salesman  | 7698 | 2011-09-08 | 1500 |    0 |     30 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams  | Clerk     | 7698 | 2013-01-12 | 1100 | NULL |     20 |
+-------+--------+-----------+------+------------+------+------+--------+
12 rows in set (0.00 sec)
```