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> create table EMP(EMPNO int,ENAME varchar(15),JOB char(15),MGR
int,HIREDATE date,SAL int,COMM int,DEPTNO int);
Query OK, 1 row affected (0.01 sec

mysql> desc EMP;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| EMPNO    | int         | YES  |     | NULL    |       |
| ENAME    | varchar(15) | YES  |     | NULL    |       |
| JOB      | char(15)    | YES  |     | NULL    |       |
| MGR      | int         | YES  |     | NULL    |       |
| HIREDATE | date        | YES  |     | NULL    |       |
| SAL      | int         | YES  |     | NULL    |       |
| COMM     | int         | YES  |     | NULL    |       |
| DEPTNO   | int         | YES  |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)

mysql> insert into EMP values (7369,'Smith','Clerk',7902,'2010-12-
17',800,null,20);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7499,'Allen','Salesman',7698,'2011-02-
20',1600,300,30);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7521,'Ward','Salesman',7698,'2011-02-
22',1250,500,30);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7566,'Jones','Manager',7839,'2011-04-
02',2975,null,20);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7654,'Martin','Salesman',7698,'2011-09-
28',1250,1400,30);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7698,'Blake','Manager',7838,'2011-05-
01',2850,null,30);
Query OK, 1 row affected (0.02 sec)

mysql> insert into EMP values (7782,'Clark','Manager',7838,'2011-06-
09',2450,null,10);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into EMP values (7788,'Scott','Analyst',7566,'2012-12-
09',3000,null,20);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7839,'King','President',null,'2011-11-
17',5000,null,10);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7844,'Turner','Salesman',7698,'2011-09-
08',1500,0,30);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7876,'Adams','Clerk',7698,'2013-01-
12',1100,NULL,20);
Query OK, 1 row affected (0.01 sec)

mysql> insert into EMP values (7876,'Adams','Clerk',7698,'2013-01-
12',1100,NULL,20);
Query OK, 1 row affected (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 ENAME from EMP where JOB='Analyst' or JOB='Salesman';
+--------+
| ENAME  |
+--------+
| Allen  |
| Ward   |
| Martin |
| Scott  |
| Turner |
+--------+
5 rows in set (0.00 sec)


mysql> select * from EMP where HIREDATE<'2011-09-30';
+-------+--------+-----------+------+------------+------+------+--------+
| 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 |
| 7844 | Turner | Salesman | 7698 | 2011-09-08 | 1500 |    0 |     30 |
+-------+--------+----------+------+------------+------+------+--------+
8 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 ENAME from EMP where not(JOB = 'Manager');
+--------+
| ENAME  |
+--------+
| Smith  |
| Allen  |
| Ward   |
| Martin |
| Scott  |
| King   |
| Turner |
| Adams  |
| Adams  |
+--------+
9 rows in set (0.00 sec)


mysql> select ENAME from EMP where EMPNO in(7369,7521,7839,7934,7788);
+-------+
| ENAME |
+-------+
| Smith |
| Ward  |
| Scott |
| King  |
+-------+
4 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 * from EMP where not DEPTNO in(30,40,10);
+-------+-------+---------+------+------------+------+------+--------+
| EMPNO | ENAME | JOB     | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+-------+---------+------+------------+------+------+--------+
|  7369 | Smith | Clerk   | 7902 | 2010-12-17 |  800 | NULL |     20 |
|  7566 | Jones | Manager | 7839 | 2011-04-02 | 2975 | NULL |     20 |
|  7788 | Scott | Analyst | 7566 | 2012-12-09 | 3000 | NULL |     20 |
|  7876 | Adams | Clerk   | 7698 | 2013-01-12 | 1100 | NULL |     20 |
|  7876 | Adams | Clerk   | 7698 | 2013-01-12 | 1100 | NULL |     20 |
+-------+-------+---------+------+------------+------+------+--------+
5 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 from EMP where HIREDATE between '2011-06-30' and
'2011-12-31';
+--------+
| ENAME  |
+--------+
| Martin |
| King   |
| Turner |
```

```
+--------+
3 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 distinct(JOB) from EMP;
+-----------+
| JOB       |
+-----------+
| Clerk     |
| Salesman  |
| Manager   |
| Analyst   |
| President |
+-----------+
5 rows in set (0.01 sec)


mysql> select ENAME from EMP where COMM is null;
+-------+
| ENAME |
+-------+
| Smith |
| Jones |
| Blake |
| Clark |
| Scott |
| King  |
| Adams |
| Adams |
+-------+
8 rows in set (0.00 sec)

mysql> select ENAME from EMP where MGR is null;
+-------+
| ENAME |
+-------+
| King  |
+-------+
1 row in set (0.00 sec)
```

```
mysql> select * from EMP where DEPTNO is null;
Empty set (0.00 sec)

mysql> select ENAME from EMP where not(COMM is null);
+--------+
| ENAME  |
+--------+
| Allen  |
| Ward   |
| Martin |
| Turner |
+--------+
4 rows in set (0.00 sec)

mysql> select ENAME from EMP where ENAME like 'S%' or ENAME like '%s';
+-------+
| ENAME |
+-------+
| Smith |
| Jones |
| Scott |
| Adams |
| Adams |
+-------+
5 rows in set (0.00 sec)

mysql> select ENAME from EMP where ENAME like '_i%';
+-------+
| ENAME |
+-------+
| King  |
+-------+
1 row in set (0.00 sec)
```