SQL Problem Sheet 1

1. Access the Data Dictionary and display the names of all of the tables which you own.

2. Describe the Structure of the EMP Table.

3. List all of the information in all of the fields in the EMP table.

4. List the name and number of all the departments in the DEPT table.

5. Add a record containing a new department number (50), name (PENSIONS) and location (CHICAGO) into the DEPT table.

6. Add a record containing a new department number (60) and department name (CONTRACTS) into the DEPT table.

7. List all of the information in the EMP table for those employees who are in department number 30.

8. Retrieve all of the information in the EMP table from those employees who are MANAGERs and who earn more than £2500 per year.

9. List the name, job and department number of all of those employees who are managers and who are not in department number 30.
   Hint : !=

10. List the name and salary of all the employees in the EMP table who earn between £1200 and £1400
    Hint : BETWEEN A and B

11. List all of the information in DEPT about those departments whose number is either 10 or 30.
    Hint : IN (10,30)

12. List the names of all employees who have R as the third letter in their name.
    Hint : Like '_ _ R %'

SQL Problem Sheet 2

1. List the salaries, jobs, and names of the employees who are in department 30. Display the rows in salary order.

2. List the job, salary and employee name of all those employees in the emp table. Display the rows in job order and then in descending salary order.
   Hint : Order by
   Hint : Desc

3. Get a listing of the distinct jobs in the emp table.
   Hint : Distinct

4. Get the employee name and department number of all employees called ADAMS.

5. Get the location of department number 20.

6. Get the employee name and department location of the employee called ADAMS.
   Hint : emp.deptno = dept.deptno

7. Get the employee name and total salary of all employees who are salesmen.
   Hint : Sal + Comm

8. Get the name, job and hiredate of all employees in department 20 and display the hiredate in the form : DY DD MON YYYY.
   Hint : to_char(hiredate,'....')hiredate - where the format you require follows the first hiredate.

9. Get the employee number, employee name, job, department number and department location of all employees..

   Did you get an error?. What caused the error?

10. Get the maximum salary paid in each department.
    Hint : Use group by and max(sal)

SQL Problem Sheet 3

1. Get the number of employees in each job in each department in the company. Also list the department they are in, the job title, the sum of the salaries of each employee type in each department, the average salary of each employee type in each department, and show the information grouped by department name and job.
   Hint : Use sum(sal), count(*), avg(sal) and group by.
   Note : Count(*) counts the number of rows in each group as defined by the 'group by' command.
   Note : Sum and Avg work the groups of rows as defined by the 'group by' command.

2. Show the same information as query 1 does but only show the groups having at least two employees.
   Hint : Having count(*)

3. List the names and jobs for all of the employees having the same job as JONES.
   Hint : Use a subquery.

4. List the name and salary of each employee who earns more than the average of all of the employees salaries.
   Hint : Use a subquery and the avg function.

5. Update the emp table to give all clerk's a £100 increase in salary.

6. Using a single command, create a table called promotion with fields called ename, job, salary, and comm, then copy the corresponding data from the fields in the emp table into the promotion table for all those employee whose commission is more than one quarter of their salary.
   Hint : See handout on Miscellaneous SQL Commands.

7. Delete all records in the dept table which have a department number of 50 and then view the contents of the table to ensure that the operation has been completed correctly.

8. Create a view called emp10 with the empno, ename, and job data for department 10. When you create the view give it the check option.

9. Insert the following information into the EMP10 view
   20 BAILEY MANAGER
   Note : Can you see the reason for the problem ?

10. List all of the data in view emp10.

SQL Problem Sheet 4

1. Create a table called proj with the following fields :

projno	numeric	3 long	not null
pname	character	5 long	
budget	numeric	7 long with 2 decimal places	

2. Insert into proj the following data

101 ALPHA	96000
102 BETA	82000
103 GAMMA	15000

3. View the data in proj.

4. Give the emp table a column called projno and describe the table. The proj field should have the same type and size as in the proj table.

5. Assign everyone in department 20 and every salesman to project 101 and view the emp table.

6. Assign everyone else to project 102 and view the emp table.

7. List the employee numbers, jobs, department numbers and project name's.

8. Alter the width of the project budget field to 8 places including 2 decimal places.

9. Change the budget for project 103 to 105000

10. View the employee, number, name, department number, department location, project name and project budget

SQL Problem Sheet 5

1. Create a view called PERSONNEL which contains employee names, jobs and project names.

2. Using the PERSONNEL view, select the employee names, jobs and project names for all employees who are managers.

3. Delete the PERSONNEL view

4. Describe the contents of the user_tables data dictionary table.

5. Using the user_tables table, display a list of the tables which you own.

6. Give another user select rights on your emp table and have them try a select operation on it.

7. Create a new view called emps with empno, ename, job, mgr, hiredate and deptno.

8. Update the emp table, move the employee with the highest commission to department number 40, make him/her a manager and give him/her a pay raise of £1000.
   Hint : Use a subquery and >= all as with the ALL and ANY slide on the SQL Commands Handout.

9. Get the employee name, department name and project name of all employees.

10. Get the employee number, employee name, department number, department name, department location, project number, project name and project budget of all employees called 'ADAMS'.

SQL Problem Sheet 6 (a) – SQL Integrity

1. Create a Primary Key on empno in the emp table. Call the Constraint pk_emp.
2. Insert a record into emp with the following values:
   empno: 8000 ename: JONES job: CLERK mgr: 0
   hiredate: 12-DEC-99 sal: 1250 comm.: 0 deptno: 10
   projno: 101
3. Insert a record into emp with the following values:
   empno: 8000 ename: SMITH job: MANAGER hiredate: 10-JAN-99 mgr: 1890
   sal: 1950 comm.: 0 deptno: 20 projno: 102
   What happens? Why did this happen.?
4. Create a Primary Key on deptno in the dept table. Call the Constraint pk_dept.
5. Create a Primary Key on projno in the proj table. Call the Constraint pk_proj.
6. Create a Foreign Key on deptno in the emp table. It should reference the primary key in the dept table Call the Constraint fk_emp_dept.
7. Create a Foreign Key on projno in the emp table. It should reference the primary key in the proj table Call the Constraint fk_emp_proj.
8. Insert a record into emp with the following values:
   empno: 8010 ename: WALKER job: CLERK hiredate: 12-FEB-99 mgr: 0
   sal: 2250 comm.: 0 deptno: 10 projno: 102
9. Insert a record into emp with the following values:
   empno: 8012 ename: BAKER job: SALESMAN hiredate: 15-FEB-99 mgr: 0
   sal: 2050 comm.: 590 deptno: 90 projno: 102
   What happens? Why did this happen.?
10. Insert a record into dept with the following values:
    deptno: 90 dname: RandD loc: GALWAY

SQL Problem Sheet 6 (b) – SQL Integrity

1. Repeat action 9
   What happens? Why did this happen.?
2. Insert a record into emp with the following values:
   empno: 8115 ename: FERRY job: ANALYST hiredate: 19-MAR-99 mgr: 0
   sal: 1950 comm.: 0 deptno: 20 projno: 104
   What happens? Why did this happen.?
3. Insert a record into dept with the following values:
   projno: 104 pname: HEAT budget: 10000
4. Repeat action 11
   What happens? Why did this happen?
5. Delete department number 90 in dept
   What happens? Why did this happen.? What do you have to do to be able to delete department number 90?
6. Access the data dictionary and retrieve your list of integrity constraints.
   Hint: user_constraints table, don't forget to describe it first, its got lost of fields.
7. Drop the foreign-key integrity constraint between emp and proj.
8. Create a constraint on sal in the emp table to ensure that the minimum salary must be over £500. Call the Constraint emp_sal_check.
9. Insert a record into emp with the following values:
   empno: 8502 ename: HEART job: ANALYST hiredate: 08-MAY-99 mgr: 0
   sal: 300 comm.: 0 deptno: 10 projno: 102
   What happens? Why did this happen.?
10. Change the employees salary to £600 and try to insert it again.

SQL Problem Sheet 7 – SQL Security

1. Give another user select and update rights on your emp table

2. Ask the other user to select data from your emp table

3. Ask the other user to update the name of employee number 7782 by changing it to 'FIELDS'

4. a) View the change.
   b) Is it visible?
   c) If not why not?
   d) What must you do to make it visible?

5. Give every user select rights on your emp table.
   Hint: Public.

6. Revoke the other users update rights on your emp table and have them try that operations on it.

To be completed after the Database System Security Lecture

7. Create a role called developer

8. Grant three privileges: create table, create view and create procedure to the developer role

9. Give one of your class-mates access to the developer role

10. Revoke the create procedure privilege from the developer role

11. Create a role called analyst which with the following password: 'secure'

12. Grant a privilege to analyst which will allow its user to select data from your dept table.

13. Grant the analyst role to a class-mate ;

14. Have your class-mate bring the analyst role on-line. Remember its got a password.

15. Have your class-mate retrieve data from your dept table.

16. Drop the developer role.

17. Drop the analyst role.