Lab Manual for Introduction to Database Systems
Lab-06
Practice of SQL Queries

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Lab 6: Practice of SQL Queries

1. Introduction

You have learnt the basics of SQL in previous labs in which you have studied about DDL queries, DML queries, with a special focus on Select Queries, aggregate functions, advanced functions of SQL (DATE Functions, STRING functions) etc. Now in this lab we will focus on the practice of the previous topics.

Relevant Lecture Material

a) Revise all previous lectures
b) Text Book: Database Systems, A practical approach to design, implementation and management by Thomas Connolly, Carolyn Begg, Addison Wesley, Fifth Edition.
  1. Read URL:
     i. https://www.tutorialspoint.com/sql/index.htm

2. Activity Time boxing

Table 1: Activity Time Boxing

| Task No.	Activity Name	Activity time	Total Time
6.2	Setting-up and Setting Up XAMPP (MySQL, Apache)	20mins	20mins
6.3	Walkthrough Tasks	30mins	60mins
7	Practice tasks	20 to 30mins for each task	50mins
8	Evaluation Task	40mins for all assigned task	40mins

3. Objective of the experiment

To do practice of SQL queries related to the topics covered in the previous labs.

4. Concept Map

Consider the below given schema of oracle database. We will use this database for the purpose of practice.

4.1 Database Design:
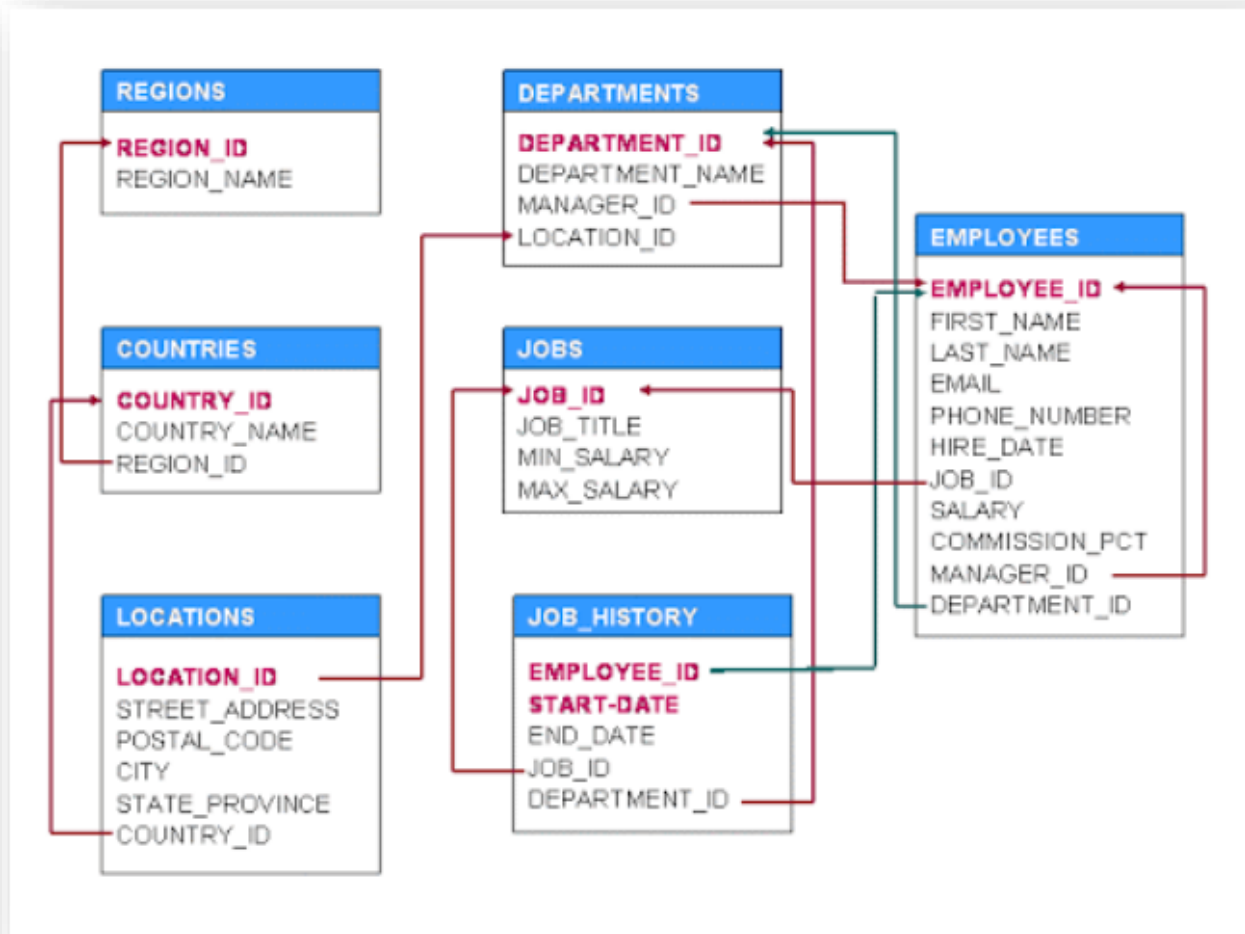
5. Homework before Lab

You must solve the following problems at home before the lab.

5.1. Problem Solution Modeling

After reading the reference material mentioned in the introduction, now you are ready to perform homework assigned to you.

5.1.1.   Problem description:

Describe the aggregate functions, limit, GROUP BY and HAVING clause and its purpose. You must create at least 5 examples of all clauses other than your practice tasks submit to lab teacher in hard form.

6. Procedure& Tools

6.1. Tools

In this section tools installation and setup is defined.

6.2. Setting-up and Setting up XAMPP (MySQL, Apache)   *[Expected time = 5mins]*

Refer to Lab 1 sec 6.2.

7. Practice Tasks

This section will provide more practice exercises which you need to finish during the lab. You need to finish the tasks in the required time. When you finish them, put these tasks in the following folder:
\\fs\assignments$\IDBS \Lab6

Questions:

1. List all employees' first names in descending order and their phone numbers.

2. Show employee id of top 5 employees on the basis of salary.

3. Select first ten employees.

4. Show job id of jobs whose difference between maximum and minimum salary is greater than 5000.

5. Show all the countries names and country id of region 1 and 2.

6. Show all the jobs whose half salary is greater than 5000.

7. What is the minimum salary paid?

8. Show the employee first names of those who were hired in 2007.

9. List the job id that contains 'MGR' along with concatenation with job title.

10. Show name and job id of all employees who reports to manager whose id is 100.

11. Show the total salary paid to employees whose job id is "FI_ACCOUNT".

12. Show the location of string "MGR" in all job ids.

13. Show the total number of countries in each region.

14. Show top 2 regions on the basis of number of countries.

15. Which location has maximum number of departments?

16. Show manager and number of employees who reports to him/her.

17. Show the managers who are managing more than 3 employees.

18. Show manager of sales department.

19. Show employees who did job for less than 1 year. (Hint: start date and end date in same year)

20. Show average salary, job id, number of employees, manager id for each job.

21. Show all locations along with city whose postal code start with 0.

22. Show states of UK in descending order of state names.

23. Show all the job titles that contains "Manager" string. Show the job titles in ascending order of minimum salary.

24. Show locations whose country id is "IT" and state is null.

25. Show all the city names that start with 'S' and end at 'e'.

26. Which department has more than 3 employees.

27. How many employees are there in the company?

28. Show the employee id, first name and last names of the employees whose hire date is 2003-06-17.

29. Show the distinct names of department.

30. Show current date and time of the system.

31. Show 25% salary of each job.

32. Show number of employees doing same job.

Perform following SQL queries n a new database as mentioned below.

1. Create a database named "Library_db".

2. Create a table for books with following attributes with suitable data types.

i. Book_id

ii. Title

iii. Author

iv. YearOfPublication

3. Change table name to "CSbooks".

4. Create another column "bookStatus" in this table.

5. Display the structure of books table.

6. Create a table employee. Use proper datatypes for all attributes.

Constraints:

(i)   empNumber (should be unique)

(ii)   Name (should have default value : "None", should not take null value)

(iii)   DateOfBirth (should not take null value)

(iv)   YearOfAppointment

7. Insert a complete record in employees table.

8. Insert the following record in employees table:

    empNumber : 523

    YearOfAppointment: 2018

9. Set yearOfAppointment equal to 2019 for employees who joined in 2018.

10. Remove the record of employee whose empNumber is 523.

8. Evaluation Task (Unseen)   [Expected time = 60mins for two tasks]

The lab instructor will give you unseen task depending upon the progress of the class.

9. Evaluation criteria

The evaluation criteria for this lab will be based on the completion of the following tasks. Each task is assigned the marks percentage which will be evaluated by the instructor in the lab whether the student has finished the complete/partial task(s).

Table 3: Evaluation of the Lab

Sr. No.	Task No	Description	Marks
1	6	Procedures and Tools	05
2	7	Practice tasks and Testing	15
3	8	Evaluation Tasks (Unseen)	80

10. Further Reading

This section provides the references to further polish your skills.

10.1. Text Book

Database Systems, A practical approach to design, implementation and management by Thomas Connolly, Carolyn Begg,, Addison Wesley, Fifth Edition.

10.2. Slides

The slides and reading material can be accessed from the folder of the class instructor available at \\fs\lectures$\

11. REFERENCES:

11.1. *SQL-99 Complete, Really, by Peter Gulutzan & Trudy Pelzer.*
- More examples for the SELECT command:
  http://dev.mysql.com/doc/mysql/en/select.html
- MySQL operators: http://dev.mysql.com/doc/mysql/en/non-typed_operators.html
- Built-in functions: http://dev.mysql.com/doc/mysql/en/functions.html
- Joining tables:
  http://www.melonfire.com/community/columns/trog/article.php?id=148
- Using subqeries:
  http://www.melonfire.com/community/columns/trog/article.php?id=204
- Using subqeries:
  http://www.melonfire.com/community/columns/trog/article.php?id=204