

Problem Statement / Case Study

Table descriptions

Emp

Name	Null?	Type
Empno	Not Null	int(4)
Ename	-	Varchar(10)
job		Varchar(9)
mgr		int(4)
Hiredate		Date
Sal	-	int(7,2)
Comm	-	int(7,2)
Deptno	-	int(2)

Designation_Master

Name	Null?	Type
Design_code	Not Null	int(3)
Design_name		Varchar(50)

Department_Master

Name	Null?	Type
Dept_Code	Not Null	int(2)
Dept_name		Varchar(50)

Student_Master

Name	Null?	Type
Student_Code	Not Null	int(6)
Student_name	Not Null	Varchar(50)
Dept_Code		int(2)
Student_dob		Date
Student_Address		Varchar(240)

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Student_Marks

Name	Null?	Type
Student_Code		int(6)
Student_Year	Not Null	Int
Subject1		int(3)
Subject2		int(3)
Subject3		int(3)

Staff_Master

Name	Null?	Type
Staff_code	Not Null	int(8)
Staff_Name	Not Null	Varchar(50)
Design_code		Int
Dept_code		Int
HireDate		Date
Staff_dob		Date
Staff_address		Varchar(240)
Mgr_code		int(8)
Staff_sal		int(10,2)

Book_Master

Name	Null?	Type
Book_Code	Not Null	int(10)
Book_Name	Not Null	Varchar(50)

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Book_pub_year		Int
Book_pub_author	Not Null	Varchar(50)

Book_Transactions

Name	Null?	Type
Book_Code		Int
Student_code		Int
Staff_code		Int
Book_Issue_date	Not Null	Date
Book_expected_return_date	Not Null	Date
Book_actual_return_date		Date

Data Query Language

Goals	<ul style="list-style-type: none"> • Query the database • Usage of various operators in select statements
Time	45 mins

1.1: Data Query Language

1. List the Name and Designation code of the staff who have joined before Jan 2003 and whose salary range is between 12000 and 25000. Display the columns with user defined Column headers. Hint: Use As clause along with other operators
2. List the staff code, name, and department number of the staff who have experience of 18 or more years and sort them based on their experience.
3. Display the staff details who do not have manager. Hint: Use is null
4. Display the Book details that were published during the period of 2001 to 2004. Also display book details with Book name having the character '&' anywhere.
5. List the names of the staff having '_' character in their name.

Single Row And Group Functions

Goals	<ul style="list-style-type: none"> • Querying tables using single row functions • Querying tables using date functions • Querying tables using number functions • Querying tables using group functions
Time	2 hrs

2.1: Single Row Functions:

1. Create a query which will display Staff Name, Salary of each staff. Format the salary to be 15 characters long and left padded with '\$'.
2. Display name and date of birth of students where date of birth must be displayed in the format similar to "January, 12 1981" for those who were born on Saturday or Sunday.
3. Display each Staff name and number of months they worked for the organization. Label the column as 'Months Worked'. Order your result by number of months employed. Also Round the number of months to closest whole number.
4. List the details of the staff who have joined in first half of December month (irrespective of the year).
5. Write a query that displays Staff Name, Salary, and Grade of all staff. Grade depends on the following table.

Salary	Grade
Salary >=50000	A
Salary >= 25000 < 50000	B
Salary>=10000 < 25000	C
OTHERS	D

6. Display the Staff Name, Hire date and day of the week on which staff was hired. Label the column as DAY. Order the result by the day of the week starting with Monday. Hint :Use to_char with hiredate and formats 'DY' and 'D'

7. Write a query to find the position of third occurrence of 'i' in the given word 'Mississippi'.
8. Write a query to find the pay date for the month. Pay date is the last Friday of the month. Display the date in the format "Twenty Eighth of January, 2002". Label the heading as PAY DATE. Hint: use to_char, next_day and last_day functions
9. Display Student code, Name and Dept Name. Display "Electricals" if dept code = 20, "Electronics" if Dept code =30 and "Others" for all other Dept codes in the Dept Name column. Hint : Use Decode

2.2: Group Functions:

1. Display the Highest, Lowest, Total & Average salary of all staff. Label the columns Maximum, Minimum, Total and Average respectively for each Department code. Also round the result to the nearest whole number.
2. Display Department code and number of managers working in that department. Label the column as 'Total Number of Managers' for each department.
3. Get the Department number, and sum of Salary of all non-managers where the sum is greater than 20000.

JOINS AND SUBQUERIES

Goals	<ul style="list-style-type: none"> Querying multiple tables using joins Querying tables using subqueries
Time	2 hr 30 min

3.1: Joins and Subqueries

- Write a query which displays Staff Name, Department Code, Department Name, and Salary for all staff who earns more than 20000.
- Display Staff Code, Staff Name, Department Name, and his manager's number and name. Label the columns Staff#, Staff, Mgr#, Manager.
- Create a query that will display Student Code, Student Name, Book Code, and Book Name for all students whose expected book return date is today.
- Create a query that will display Staff Code, Staff Name, Department Name, Designation name, Book Code, Book Name, and Issue Date for only those staff who have taken any book in last 30 days. . If required, make changes to the table to create such a scenario.
- Generate a report which contains the following information.

Staff Code, Staff Name, Designation Name, Department, Book Code, Book Name,

Author, Fine For the staff who has not returned the book. Fine will be calculated as Rs. 5 per day.

 $\text{Fine} = 5 * (\text{No. of days} = \text{Current Date} - \text{Expected return date})$. Include records in the table to suit this problem statement
- List Staff Code, Staff Name, and Salary for those who are getting less than the average salary of organization.
- Display Author Name, Book Name for those authors who wrote more than one book.

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8. Display Staff Code, Staff Name, and Department Name for those who have taken more than one book.
9. Display the Student Code, Student Name, and Department Name for that department in which there are maximum number of student studying.
10. Display Staff Code, Staff Name, Department Name, and Designation name for those who have joined in last 3 months.
11. Display the Manager Name and the total strength of his/her team.
12. Display the details of books that have not been returned and expected return date was last Monday. Book name should be displayed in proper case.. Hint: You can change /add records so that the expected return date suits this problem statement
13. Write a query to display number of people in each Department. Output should display Department Code, Department Name and Number of People.

Database Objects

Goals	<p>Following set of questions are designed to implement the following concepts</p> <ul style="list-style-type: none"> • Creating Database objects like tables, views , etc • Modifying Database objects • Deleting Database objects • Usage of Data Dictionary tables
Time	2 hr 30 min

4.1: Database Objects

- Create the Customer table with the following columns.

CustomerId int(5)

Cust_Name varchar(20)

Address1 Varchar(30)

Address2 Varchar(30)
- Modify the Customer table Cust_Name column of datatype with Varchar2(30), rename the column to CustomerName and it should not accept Nulls.
- Add the following Columns to the Customer table.

Gender Varchar(1)

Age int(3)

PhoneNo int(10)
 - Rename the Customer table to Cust_Table
- Insert rows with the following data in to the Customer table.

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Insert into customer values: (1000, 'Allen', '#115 Chicago', '#115 Chicago', 'M', '25, 7878776')

In similar manner, add the below records to the Customer table:

1001, George, #116 France, #116 France, M, 25, 434524

1002, Becker, #114 New York, #114 New York, M, 45, 431525

5. Add the Primary key constraint for CustomerId with the name CustId_Prim.
6. Insert the row given below in the Customer table and see the message generated by the Oracle server.

1002, John, #114 Chicago, #114 Chicago, M, 45, 439525

7. Disable the constraint on CustomerId, and insert the following data:

1002, Becker, #114 New York, #114 New york , M, 45, 431525

1003, Nanapatekar, #115 India, #115 India , M, 45, 431525

8. Enable the constraint on CustomerId of the Customer table, and see the message generated by the Oracle server.

9. Drop the constraint CustId_Prim on CustomerId and insert the following Data. Alter Customer table, drop constraint Custid_Prim.

1002, Becker, #114 New York, #114 New york , M, 45, 431525, 15000.50

1003, Nanapatekar, #115 India, #115 India , M, 45, 431525, 20000.50

10. Delete all the existing rows from Customer table, and let the structure remain itself using TRUNCATE statement.

11. In the Customer table, add a column E_mail.

12. Drop the E_mail column from Customer table.

13. Create the Suppliers table based on the structure of the Customer table. Include only the CustomerId, CustomerName, Address1, Address2, and phoneno columns.

Name the columns in the new table as SupplID, SName, Addr1, Addr2, and Contactno respectively.

14. Drop the above table and recreate the following table with the name CustomerMaster.

CustomerId int(5) Primary key(Name of constraint is CustId_PK)

CustomerName Varchar(30) Not Null

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Address1	Varchar(30) Not Null
Address2	Varchar(30)
Gender	Varchar(1)
Age	int(3)
PhoneNo	int(10)

15. Create the AccountsMaster table with the following Columns. Use auto generate to generate Account number

CustomerId	int(5)
AccountNumber	int(10,2) Primary key(Name of constraint is Acc_PK)
AccountType	Char(3)
LedgerBalance	int(10,2) Not Null

16. Relate AccountsMaster table and CustomerMaster table through CustomerId column with the constraint name Cust_acc.

17. Insert the following rows to the CustomerMaster table:

1000, Allen, #115 Chicago, #115 Chicago, M, 25, 7878776

1001, George, #116 France, #116 France, M, 25, 434524

1002, Becker, #114 New York, #114 New York, M, 45, 431525

18. Modify the AccountMaster table with the Check constraint to ensure AccountType should be either NRI or IND.
19. Modify the AccountsMaster table keeping a Check constraint with the name Balance_Check for the Minimum Balance which should be greater than 5000.
20. Modify the AccountsMaster table such that if Customer is deleted from Customer table then all his details should be deleted from AccountsMaster table.
21. Create Backup copy for the AccountsMaster table with the name 'AccountDetails'.
22. Create a view 'Acc_view' with columns CustomerId, CustomerName, AccountNumber, AccountType, and LedgerBalance from AccountsMaster. In the view Acc_view, the column names should be CustomerCode,

AccountHolderName, AccountNumber, Type, and Balance for the respective columns from AccountsMaster table.

23. Create a view on AccountsMaster table with name vAccs_Dtls. This view should list all customers whose AccountType is 'IND' and their balance amount should not be less than 10000. Using this view any DML operation should not violate the view conditions.



Hint: Use the With Check Option constraint.

24. Create a view accsvw10 which will not allow DML statement against it.
25. Insert three sample rows by using the above auto generate in Department_Masters table.
26. Get information on the index No_Name from the Data Dictionary.
27. Create synonym synEmp for the EMP table.
28. Get Information on synonym synEmp from the Data Dictionary.
29. Note: Perform this after creating the Employee Table mentioned in the next Lab assignment. Create Index on HireDate column and give the name as idx_emp_hiredate for this object.

Goals	<p>Creating table to do the following DML operations</p> <ul style="list-style-type: none"> • Insert Records • Delete Records • Update Records
Time	30 mins

5.1: Data Manipulation Language

1. Create Employee table with same structure as EMP table.
SQL>Create table employee as select * from emp where 1=3

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SQL>desc employee

Name	Null?	Type
EMPNO	NOT NULL	int(4)
ENAME		VARCHAR(10)
JOB		VARCHAR(50)
MGR		int(4)
HIREDATE		DATE
SAL		int(7,2)
COMM		int(7,2)
DEPTNO		int(2)

SQL>select * from employee

- Write a query to populate Employee table using EMP table's empno, ename, sal, deptno columns.

SQL>select * from employee

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH				800		20
7499	ALLEN				1600		30
7521	WARD				1250		30
7566	JONES				2975		20
7654	MARTI N				1250		30
7698	BLAKE				2850		30
7782	CLARK				2450		10
7788	SCOTT				3000		20
7839	KING				5000		10

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7844	TURNER				1500		30
7876	ADAMS				1100		20
7900	JAMES				950		30
7902	FORD				3000		20
7934	MILLER				1300		10

14 rows selected.

3. Write a query to change the job and deptno of employee whose empno is 7698 to the job and deptno of employee having empno 7788.
4. Delete the details of department whose department name is 'SALES'.
5. Write a query to change the deptno of employee with empno 7788 to that of employee having empno 7698.
6. Insert the following rows to the Employee table through parameter substitution.
 - 1000,Allen, Clerk,1001,12-jan-01, 3000, 2,10
 - 1001,George, analyst, null, 08 Sep 92, 5000,0, 10
 - 1002, Becker, Manager, 1000, 4 Nov 92, 2800,4, 20
 - 1003, 'Bill', Clerk, 1002, 4 Nov 92,3000, 0, 20