

LAB MANUAL

Lab Name : Database Management System Lab
Lab Code : 4CS4-22
Branch : Computer Science & Engineering
Year : 2nd Year



Jaipur Engineering College and Research Center, Jaipur
Department of Electrical Engineering
(Rajasthan Technical University, KOTA)



Jaipur Engineering College and Research Centre, Jaipur
Department of Computer Science and Engineering
Database Management System Lab [4CS4 - 22]

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Exp: -5	Objective: - 5. Normalizing the database including analysis of functional dependencies.
Exp: -6	Objective: - 6. Installing and configuring the database server and the front end tools.
Exp: -7	Objective: - 7. Designing database and writing applications for manipulation of data for a standalone and shared data base including concepts like concurrency control, transaction roll back, logging, report generation etc.
Exp: -8	Objective: -8. Get acquainted with Structured Query Language.



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1. VISION & MISSION

VISION: To become renowned Centre of excellence in computer science and engineering and make competent engineers & professionals with high ethical values prepared for lifelong learning.

MISSION:

M1: To impart outcome-based education for emerging technologies in the field of computer science and engineering.

M2: To provide opportunities for interaction between academia and industry.

M3: To provide platform for lifelong learning by accepting the change in technologies

M4: To develop aptitude of fulfilling social responsibilities

2. PEO

1. To provide students with the fundamentals of Engineering Sciences with more emphasis in **Computer Science & Engineering** by way of analyzing and exploiting engineering challenges.
2. To train students with good scientific and engineering knowledge so as to comprehend, analyze, design, and create novel products and solutions for the real life problems.
3. To inculcate professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, entrepreneurial thinking and an ability to relate engineering issues with social issues.
4. To provide students with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the self-motivated life-long learning needed for a successful professional career.
5. To prepare students to excel in Industry and Higher education by Educating Students along with High moral values and Knowledge

3. PROGRAM OUTCOMES

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems in IT.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences in IT.



3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations using IT.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions using IT.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations in IT.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice using IT.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development in IT.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice using IT.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings in IT.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project Management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage IT projects and in multidisciplinary environments.
12. **Life –long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes needed in IT.



MAPPING OF PEOs & POs

PROGRAM OBJECTIVES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
I	3	1										3
II	2	3	2	3		3					1	3
III	1	3	2	3	1						2	
IV				1	2		3	2	3		2	
V									2	2		

[L=1, M=2, H=3]

4. COURSE OUTCOMES

CO1: Design a database for a system and understand the requirement and design methodology of system.

CO2: Perform queries, operations and retrieve data from the database using SQL.

5. MAPPING OF CO & PO

Subject	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
Database Management System Lab(4CS4-22)	CO 1	3	3	3	3	3	2	2	2	2	3	2	3
	CO 2	3	3	3	3	3	2	1	2	2	3	2	3

[L=1, M=2, H=3]



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6. Syllabus



RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

II Year-IV Semester: B.Tech. Computer Science and Engineering

4CS4-22: Database Management System Lab

Credit: 1.5

Max. Marks: 75(IA:45, ETE:30)

OL+OT+3P

List of Experiments:

1. Design a Database and create required tables. For e.g. Bank, College Database
2. Apply the constraints like Primary Key, Foreign key, NOT NULL to the tables.
3. Write a SQL statement for implementing ALTER, UPDATE and DELETE.
4. Write the queries to implement the joins.
5. Write the query for implementing the following functions: MAX (), MIN (), AVG () and COUNT ().
6. Write the query to implement the concept of Integrity constraints.
7. Write the query to create the views.
8. Perform the queries for triggers.
9. Perform the following operation for demonstrating the insertion , updation and deletion
10. Using the referential integrity constraints.
11. Write the query for creating the users and their role.

Data Base Designing Project:

For better understanding students (group of 3-4 students) should design data base for any data base project, understand the requirement and design methodology of project by its own.

Some example of data base design project like:

College management system, Inventory management system and Hospital management system.



7. BOOKS

- **Text books:-**

1. H. F. Korth and Silberschatz, "Database Systems Concepts", Tata McGraw Hill (5th Edition)

- **Reference Books:-**

1. Almasri and S.B. Navathe, "Fundamentals of Database Systems", Pearson (4th Edition)

8. INSTRUCTIONAL METHODS

- **Direct Instructions:**

- I. Black board presentation

- **Interactive Instruction:**

- I. Case Study

- **Indirect Instructions:**

- I. Problem solving

- **Independent Instructions:**

- I. Assignments

9. LEARNING MATERIALS

Text/Lab Manual

Web Resources:-

- i) <http://www.w3schools.com/sql/default.asp>
- ii) <http://msdn.microsoft.com/en-us/library/bb264565%28v=sql.90%29.aspx>
- iii) <http://www.sqlcourse.com/index.html>

10. ASSESSMENT OF OUTCOMES

1. End term Practical exam (Conducted by RTU, KOTA)
2. Daily Lab interaction.



3. Lab Assignment.

• **OUTCOMES WILL BE ACHIEVED THROUGH FOLLOWING:-**

1. Lab Teaching (through chalk and board /PPT).
2. Discussion on case- studies.

INSTRUCTIONS OF LAB

DO's

1. Please switch off the Mobile/Cell phone before entering Lab.
2. Enter the Lab with complete source code and data.
3. Check whether all peripheral are available at your desktop before proceeding for program.
4. Intimate the lab in charge whenever you are incompatible in using the system or in case software get corrupted/ infected by virus.
5. Arrange all the peripheral and seats before leaving the lab.
6. Properly shutdown the system before leaving the lab.
7. Keep the bag outside in the racks.
8. Enter the lab on time and leave at proper time.
9. Maintain the decorum of the lab.
10. Utilize lab hours in the corresponding experiment.
11. Get your CD / Pen drive checked by lab in charge before using it in the lab.

DON'TS

1. No one is allowed to bring storage devices like Pan Drive /Floppy etc. in the lab.
2. Don't mishandle the system.
3. Don't leave the system on standing for long
4. Don't bring any external material in the lab.



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5. Don't make noise in the lab.
6. Don't bring the mobile in the lab. If extremely necessary then keep ringers off.
7. Don't enter in the lab without permission of lab in charge.
8. Don't litter in the lab.
9. Don't delete or make any modification in system files.
10. Don't carry any lab equipment outside the lab.

We need your full support and cooperation for smooth functioning of the

INSTRUCTIONS FOR STUDENT

BEFORE ENTERING IN THE LAB

- All the students are supposed to prepare the theory regarding the next program.
- Students are supposed to bring the practical file and the lab copy.
- Previous programs should be written in the practical file.
- Algorithm of the current program should be written in the lab copy.
- Any student not following these instructions will be denied entry in the lab.

WHILE WORKING IN THE LAB

- Adhere to experimental schedule as instructed by the lab in charge.
- Get the previously executed program signed by the instructor.
- Get the output of the current program checked by the instructor in the lab copy.
- Each student should work on his/her assigned computer at each turn of the lab.
- Take responsibility of valuable accessories.
- Concentrate on the assigned practical and do not play games.



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Software and Hardware Requirements

Software Required:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. ORACLE, D2K
4. VB, MS SQL SERVER 2000

Hardware Required:

Processor: Pentium III
RAM: 128 MB
Hard Disk: 40 GB



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Theory and Concept

Practical #1

Objective: Create tables and specify the Questionnaires in SQL.

Theory & Concepts:

Introduction about SQL-

SQL (Structured Query Language) is a nonprocedural language, you specify what you want, not how to get it. A block structured format of English key words is used in this Query language. It has the following components.

DDL (Data Definition Language)-

The SQL DDL provides command for defining relation schemas, deleting relations and modifying relation schema.

DML (DATA Manipulation Language)-

It includes commands to insert tuples into, delete tuples from and modify tuples in the database.

View definition-

The SQL DDL includes commands for defining views.

Transaction Control- SQL includes for specifying the beginning and ending of transactions.

Embedded SQL and Dynamic SQL-

Embedded and Dynamic SQL define how SQL statements can be embedded with in general purpose programming languages, such as C, C++, JAVA, COBOL, Pascal and Fortran.

Integrity-

The SQL DDL includes commands for specifying integrity constraints that the data stored in the database must specify. Updates that violate integrity constraints are allowed.

Authorization-

The SQL DDL includes commands for specifying access rights to relations and views.

Data Definition Language-



The SQL DDL allows specification of not only a set of relations but also information about each relation, including-

- Schema for each relation
- The domain of values associated with each attribute.
- The integrity constraints.
- The security and authorization information for each relation.
- The physical storage structure of each relation on disk.

Domain types in SQL-

The SQL standard supports a variety of built in domain types, including-

- Char (n) - A fixed length character length string with user specified length.
- Varchar (n) - A variable character length string with user specified maximum length n.
- Int- An integer.
- Small integer- A small integer.
- Numeric (p, d)-A Fixed point number with user defined precision.
- Real, double precision- Floating point and double precision floating point numbers with machine dependent precision.
- Float (n) - A floating point number, with precision of at least n digits.
- Date- A calendar date containing a (four digit) year, month and day of the month.
- Time- The time of day, in hours, minutes and seconds E.g. Time '09:30:00'.
- Number- Number is used to store numbers (fixed or floating point).

DDL statement for creating a table-

Syntax-

Create table tablename
(columnname datatype(size), columnname datatype(size));

Creating a table from a table-

Syntax-

CREATE TABLE TABLENAME
[(columnname, columnname,)]
AS SELECT columnname, columnname.....FROM tablename;

Insertion of data into tables-



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Syntax-

```
INSERT INTO tablename  
[(columnname, columnname, .....)]  
Values(expression, expression);
```

Inserting data into a table from another table:

Syntax-

```
INSERT INTO tablename  
  
SELECT columnname, columnname, .....  
FROM tablename;
```

Insertion of selected data into a table from another table:

Syntax-

```
INSERT INTO tablename  
SELECT columnname, columnname.....  
FROM tablename  
WHERE columnname= expression;
```

Retrieving of data from the tables-

Syntax-

```
SELECT * FROM tablename;
```

The retrieving of specific columns from a table-

Syntax-

```
SELECT columnname, columnname, ....  
FROM tablename;
```

Elimination of duplicates from the select statement-

Syntax-

```
SELECT DISTINCT columnname, columnname  
FROM tablename;
```

Selecting a data set from table data-



Syntax-

SELECT columnname, columnname
FROM tablename
WHERE searchcondition;

Assignment No.1

Q1. Create the following tables:

i) client_master

columnname	datatype	size
client_no	varchar2	6
name	varchar2	20
address1	varchar2	30
address2	varchar2	30
city	varchar2	15
state	varchar2	15
pincode	number	6
bal_due	number	10,2

ii) Product_master

Columnname	datatype	size
Product_no	varchar2	
Description	varchar2	
Profit_percent	number	
Unit_measure	varchar2	
Qty_on_hand	number	
Reorder_lvl	number	
Sell_price	number	
Cost_price	number	

Q2- Insert the following data into their respective tables:

Clientno	Name	city	pincode	state	bal.due
----------	------	------	---------	-------	---------



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0001	Ivan	Bombay	400054	Maharashtra	15000
0002	Vandana	Madras	780001	Tamil Nadu	0
0003	Pramada	Bombay	400057	Maharashtra	5000
0004	Basu	Bombay	400056	Maharashtra	0
0005	Ravi	Delhi	100001		2000
0006	Rukmini	Bombay	400050	Maharashtra	0



Data for Product Master:

Product No.	Descriptions	Profit %	Unit	Qty	Reorder	Sell	Cost
		Percent		measured	on hand	lvl	price
P00001	1.44floppies	5	piece	100	20	525	500
P03453	Monitors	6	piece	10	3	12000	11200
P06734	Mouse	5	piece	20	5	1050	500
P07865	1.22 floppies	5	piece	100	20	525	500
P07868	Keyboards	2	piece	10	3	3150	3050
P07885	CD Drive	2.5	piece	10	3	5250	5100
P07965	540 HDD	4	piece	10	3	8400	8000
P07975	1.44 Drive	5	piece	10	3	1050	1000
P08865	1.22 Drive	5	piece	2	3	1050	1000

Q3: - On the basis of above two tables answer the following Questionaries:

- Find out the names of all the clients.
- Retrieve the list of names and cities of all the clients.
- List the various products available from the product master table.
- List all the clients who are located in Bombay.
- Display the information for client no 0001 and 0002.
- Find the products with description as '1.44 drive' and '1.22 Drive'.
- Find all the products whose sell price is greater then 5000.
- Find the list of all clients who stay in in city 'Bombay' or city 'Delhi' or 'Madras'.
- Find the product whose selling price is greater than 2000 and less than or equal to 5000.
- List the name, city and state of clients not in the state of 'Maharashtra'.



Theory and Concept

Practical #2

Objective:- To Manipulate the Operations on the table.

DML (Data Manipulation Language) Data manipulation is

- The retrieval of information stored in the database.
- The insertion of new information into the database.
- The deletion of information from the database.
- The modification of information stored by the appropriate data model. There are basically two types.
 - (i) **Procedural DML**:- require a user to specify what data are needed and how to get those data.
 - (ii) **Non Procedural DML** : require a user to specify what data are needed without specifying how to get those data.

Updating the content of a table:

In creation situation we may wish to change a value in table without changing all values in the tuple . For this purpose the update statement can be used.

Update table name

Set columnname = expression, columnname = expression.....

Where columnname = expression;

Deletion Operation:-

A delete query is expressed in much the same way as Query. We can delete whole tuple (rows) we can delete values on only particular attributes.

Deletion of all rows

Syntax:

Delete from tablename :

Deletion of specified number of rows

Syntax:

Delete from table name

Where search condition ;

Computation in expression lists used to select data



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+ Addition
* multiplication
/ Division

- Subtraction
** exponentiation
() Enclosed operation



Renaming columns used with Expression Lists: - The default output column names can be renamed by the user if required

Syntax:

Select column name result_columnname,
 Columnname result_columnname,
From table name;

Logical Operators:

The logical operators that can be used in SQL sentences are

AND	all of must be included
OR	any of may be included
NOT	none of could be included

Range Searching: Between operation is used for range searching.

Pattern Searching:

The most commonly used operation on string is pattern matching using the operation 'like' we describe patterns by using two special characters.

- Percent (%) ; the % character matches any substring we consider the following examples.
- 'Perry %' matches any string beginning with perry
- '% idge %' matches any string containing ' idge as substring.
- ' - - - ' matches any string exactly three characters.
- ' - - - %' matches any string of at least of three characters.

Oracle functions:

Functions are used to manipulate data items and return result. function follow the format of function _name (argument1, argument2 ..) .An arrangement is user defined variable or constant. The structure of function is such that it accepts zero or more arguments.

Examples:

Avg return average value of n

Syntax:

Avg ([distinct/all]n)

Min return minimum value of expr.



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Syntax:

MIN((distinct/all)expr)



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Count Returns the no of rows where expr is not null

Syntax:

Count ([distinct/all]expr)

Count (*) Returns the no rows in the table, including duplicates and those with nulls.

Max Return max value of expr

Syntax:

Max ([distinct/all]expr)

Sum Returns sum of values of n

Syntax:

Sum ([distinct/all]n)

Sorting of data in table

Syntax:

Select columnname, columnname

From table

Order by columnname;



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Assignment No. # 2

Question.1 Using the table client master and product master answer the following Questionnaires.

- i. Change the selling price of '1.44 floppy drive to Rs.1150.00
- ii. Delete the record with client 0001 from the client master table.
- iii. Change the city of client_no '0005' to Bombay.
- iv. Change the bal_due of client_no '0001, to 1000.
- v. Find the products whose selling price is more than 1500 and also find the new selling price as original selling price *15.
- vi. Find out the clients who stay in a city whose second letter is a.
- vii. Find out the name of all clients having 'a' as the second letter in their names.
- viii. List the products in sorted order of their description.
- ix. Count the total number of orders
- x. Calculate the average price of all the products.
- xi. Calculate the minimum price of products.
- xii. Determine the maximum and minimum prices . Rename the title as 'max_price' and min_price respectively.
- xiii. Count the number of products having price greater than or equal to 1500.



Theory and Concept

Practical #3

Objective:- To Implement the restrictions on the table.

Data constraints: Besides the cell name, cell length and cell data type there are other parameters i.e. other data constraints that can be passed to the DBA at check creation time. The constraints can either be placed at column level or at the table level.

- i. **Column Level Constraints:** If the constraints are defined along with the column definition, it is called a column level constraint.
- ii. **Table Level Constraints:** If the data constraint attached to a specific cell in a table reference the contents of another cell in the table then the user will have to use table level constraints.

Null Value Concepts:- while creating tables if a row lacks a data value for a particular column that value is said to be null. Columns of any data types may contain null values unless the column was defined as not null when the table was created.

Syntax:

Create table tablename

(columnname datatype (size) not null)

Primary Key: primary key is one or more columns in a table used to uniquely identify each row in the table. Primary key values must not be null and must be unique across the column. A multicolumn primary key is called composite primary key.

Syntax: primary key as a column

constraint Create table tablename

(columnname datatype (size) primary key,....)

Primary key as a table

constraint Create table tablename

(columnname datatype (size), columnname datatype (size)...

Primary key (columnname, columnname));

Default value concept: At the time of cell creation a default value can be assigned to it. When the user is loading a record with values and leaves this cell empty, the DBA will automatically load this cell with the default value specified. The data type of the default value should match the data type of the column.



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Syntax:

Create table tablename
(columnname datatype (size) default value,...);



Foreign Key Concept : Foreign key represents relationship between tables. A foreign key is column whose values are derived from the primary key of the same or some other table. The existence of foreign key implies that the table with foreign key is related to the primary key table from which the foreign key is derived. A foreign key must have corresponding primary key value in the primary key table to have meaning.

Foreign key as a column constraint

Syntax :

Create table table name
(columnname datatype (size) references another table name);

Foreign key as a table constraint:

Syntax :

Create table name
(columnname datatype (size)....
primary key (columnname);
foreign key (columnname) references table name);

Check Integrity Constraints: Use the check constraints when you need to enforce integrity rules that can be evaluated based on a logical expression. Following are a few examples of appropriate check constraints.

- A check constraint on the name column of the client_master so that the name is entered in upper case.
- A check constraint on the client_no column of the client_master so that no client_no value starts with 'c'

Syntax:

Create table tablename
(columnname datatype (size) CONSTRAINT constraintname)
Check (expression));

Question.2 Create the following tables:

i. Sales_master

Columnname	Datatype	Size	Attributes
Salesman_no	varchar2	6	Primary key/first letter must start with 's'
Sal_name	varchar2	20	Not null



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Address	varchar2		Not null
City	varchar2	20	
State	varchar2	20	
Pincode	Number	6	
Sal_amt	Number	8,2	Not null, cannot be 0



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Tgt_to_get	Number	6,2	Not null, cannot be 0
Ytd_sales	Number	6,2	Not null, cannot be 0
Remarks	Varchar2	30	

ii. Sales_order

Columnname	Datatype	Size	Attributes
S_order_no	varchar2	6	Primary/first letter must be 0
S_order_date	Date	6	Primary key reference clientno of client_master table
Client_no	Varchar2	25	
Dely_add	Varchar2	6	
Salesman_no	Varchar2	6	Foreign key references salesman_no of salesman_master table
Dely_type	Char	1	Delivery part(p)/full(f), default f
Billed_yn	Char	1	
Dely_date	Date		Can not be less than s_order_date
Order_status	Varchar2	10	Values ('in process'; 'fulfilled'; 'back order'; 'canceled')

I. Sales_order_details

Column	Datatype	Size	Attributes
S_order_no	Varchar2	6	Primary key/foreign key references s_order_no of sales_order
Product_no	Varchar2	6	Primary key/foreign key references product_no of product_master
Qty_order	Number	8	



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Qty_disp	Number	8	
Product_rate	Number	10,2	



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Insert the following data into their respective tables using insert statement:

Data for sales_man master table

(ii)
Data

Salesman no	Salesman name	Address	City	Pin code	State	Salamt	Tgt_to_ge t	Ytd Sales	Re m
500001	Kiran	A/14 worli	Bom bay	400002	Mah	3000	100	50	Go o
500002	Manish	65, nari man	Bom bay	400001	Mah	3000	200	100	Go o
500003	Ravi	P-7 Bandra	Bom bay	400032	Mah	3000	200	100	Go o
500004	Ashish	A/5 Juhu	Bom bay	400044	Mah	3500	200	150	Go o

for

salesorder table:

S_orderno	S_orderdate	Client no	Dely type	Bill yn	Salesman no	Delay date	Orderstatus
019001	12-jan-96	0001	F	N	50001	20-jan-96	Ip
019002	25-jan-96	0002	P	N	50002	27-jan-96	C
016865	18-feb-96	0003	F	Y	500003	20-feb-96	F
019003	03-apr-96	0001	F	Y	500001	07-apr-96	F
046866	20-may-96	0004	P	N	500002	22-may-96	C
010008	24-may-96	0005	F	N	500004	26-may-96	Ip



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(iii)

Data for sales_order_details table:

S_order no	Product no	Qty ordered	Qtydisp	Product_rate
019001	P00001	4	4	525
019001	P07965	2	1	8400
019001	P07885	2	1	5250
019002	P00001	10	0	525
046865	P07868	3	3	3150
046865	P07885	10	10	5250
019003	P00001	4	4	1050
019003	P03453	2	2	1050
046866	P06734	1	1	12000
046866	P07965	1	0	8400
010008	P07975	1	0	1050
010008	P00001	10	5	525



Theory and Concept

Practical .4

Objective:- To Implement the structure of the table

Modifying the Structure of Tables- Alter table command is used to changing the structure of a table. Using the alter table clause you cannot perform the following tasks:

- (i) change the name of table
- (ii) change the name of column
- (iii) drop a column
- (iv) decrease the size of a table if table data exists.

The following tasks you can perform through alter table command.

- (i) **Adding new columns**:Syntax
ALTER TABLE tablename
ADD (newcolumnnamenewdatatype (size));
- (ii) **Modifying existing table** Syntax:
ALTER TABLE tablename
MODIFY (newcolumnnamenewdatatype (size));

NOTE: Oracle not allow constraints defined using the alter table, if the data in the table, violates such constraints.

Removing/Deleting Tables- Following command is used for removing or deleting a table.

Syntax:
DROP TABLE tablename;

Defining Integrity constraints in the ALTER TABLE command-

You can also define integrity constraints using the constraint clause in the ALTER TABLE command. The following examples show the definitions of several integrity constraints.

- (1) **Add PRIMARY KEY**-Syntax:



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ALTER TABLE tablename
ADD PRIMARY KEY (columnname);

(2) **Add FOREIGN**
KEY-Syntax:



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ALTER TABLE tablename

ADD CONSTRAINT constraintname

FOREIGN KEY(columnname) REFERENCES tablename;

Dropping integrity constraints in the ALTER TABLE command:

You can drop an integrity constraint if the rule that it enforces is no longer true or if the constraint is no longer needed. Drop the constraint using the ALTER TABLE command with the DROP clause. The following examples illustrate the dropping of integrity constraints.

(1) **DROP the PRIMARY KEY-**

Syntax:

ALTER TABLE tablename

DROP PRIMARY KEY

(2) **DROP FOREIGN KEY-**

Syntax:

ALTER TABLE tablename

DROP CONSTRAINT constraintname;



Assignment No.4

Question 1. Create the following tables:

Challan_Header

Column name	data type	size	Attributes
Challan_no	varchar2	6	Primary key
s_order_no	varchar2	6	Foreign key references s_order_no of sales_order table
challan_date	date		not null
billed_yn	char	1	values ('Y','N'). Default 'N'

Table Name : Challan_Details

Column name	data type	size	Attributes
Challan_no	varchar2	6	Primary key/Foreign key references Product_no of product_master
Qty_disp	number	4,2	not null

Q2. Insert the following values into the challan header and challan_details tables:

(i)	Challan No	S_order No	Challan Date Billed
	CH9001	019001	12-DEC-95 Y
	CH865	046865	12-NOV-95 Y
	CH3965	010008	12-OCT-95 Y

Data for challan_details table

Challan No	Product No	QtyDisp
CH9001	P00001	4
CH9001	P07965	1
CH9001	P07885	1
CH6865	P07868	3
CH6865	P03453	4
CH6865	P00001	10
CH3965	P00001	5
CH3965	P07975	2

Objective –Answer the following Questionries

Q1. Make the primary key to client_no in client_master.

Q2. Add a new column phone_no in the client_master table.



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Q3. Add the not null constraint in the product_master table with the columns description, profit percent, sell price and cost price.

Q4. Change the size of client_no field in the client_master table.

Q5. Select product_no, description where profit percent is between 20 and 30 both inclusive.



Theory & Concept

Practical #5

Objective:- To implement the concept of Joins

Joint Multiple Table (Equi Join): Some times we require to treat more than one table as though manipulate data from all the tables as though the tables were not separate object but one single entity. To achieve this we have to join tables. Tables are joined on column that have same data type and data with in tables.

The tables that have to be joined are specified in the FROM clause and the joining attributes in the WHERE clause.

Algorithm for JOIN in SQL:

1. Cartesian product of tables (specified in the FROM clause)
2. Selection of rows that match (predicate in the WHERE clause)
3. Project column specified in the SELECT clause.

1. Cartesian product:-

Consider two table student and course

```
Select B.*,P.*  
FROM student B, course P;
```

2. INNER JOIN:

Cartesian product followed by selection

```
Select B.*,P.*  
FROM student B, Course P  
WHERE B.course # P.course# ;
```

3. LEFT OUTER JOIN:

LEFT OUTER JOIN = Cartesian product + selection but include rows from the left table which are unmatched with nulls in the values of attributes belonging to the second table

Exam:

```
Select B.*,P*  
FROM student B left join course p  
ON B.course # P.course #;
```

4. RIGHT OUTER JOIN:



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RIGHT OUTER JOIN = Cartesian product + selection but include rows from right table which are unmatched

Exam:



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Select B.*,P.*
From student B RIGHT JOIN course P
B.course# = P course # ;

5. FULL OUTER JOIN

Exam Select
B.*,P.*
From student B FULL JOIN course P
On B.course # = P course # ;

ASSIGNMENT NO. 5

OBJECTIVE: Answer the following Queries:

1. Find out the product which has been sold to 'Ivan Sayross.'
2. Find out the product and their quantities that will have do delivered.
3. Find the product_no and description of moving products.
4. Find out the names of clients who have purchased 'CD DRIVE'
5. List the product_no and s_order_no of customershaavingqty ordered less than 5 from the order details table for the product "1.44 floppies".
6. Find the products and their quantities for the orders placed by 'VandanSaitwal ' and "Ivan Bayross".
7. Find the products and their quantities for the orders placed by client_no "C00001" and "C00002"
8. Find the order No., Client No and salesman No. where a client has been received by more than one salesman.
9. Display the s_order_date in the format "dd-mm-yy" e.g. "12- feb-96"
10. Find the date , 15 days after date.



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Theory & Concept

Practical # 6

Objective:- To implement the concept of grouping of Data.

Grouping Data From Tables:

There are circumstances where we would like to apply the aggregate function not only to a single set of tuples, but also to a group of sets of tuples, we specify this wish in SQL using the group by clause. The attribute or attributes given in the group by clause are used to form group. Tuples with the same value on all attributes in the group by clause are placed in one group.

Syntax:

```
SELECT columnname, columnname  
FROM tablename  
GROUP BY columnname;
```

At times it is useful to state a condition that applies to groups rather than to tuples. For example we might be interested in only those branches where the average account balance is more than 1200. This condition does not apply to a single tuple, rather it applies to each group constructed by the GROUP BY clause. To express such Query, we use the having clause of SQL. SQL applies predicates in the having may be used.

Syntax:

```
SELECT columnname, columnname  
FROM tablename  
GROUP BY columnname;  
HAVING searchcondition;
```



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Assignment No.6

Objective-Answer the following Queries:

- Q1.- Print the description and total quantity sold for each product.
- Q2.- Find the value of each product sold.
- Q3.- Calculate the average quantity sold for each client that has a maximum order value of 15000.
- Q4.- Find out the products which have been sold to Ivan.
- Q5.- Find the names of clients who have 'CD Drive'.
- Q6.- Find the products and their quantities for the orders placed by 'Vandana' and 'Ivan'.
- Q7.- Select product_no, total qty_ordered for each product.
- Q8.- Select product_no, product description and qty ordered for each product.
- Q9.- Display the order number and day on which clients placed their order.
- Q10.- Display the month and Date when the order must be delivered.



Theory & Concept

Practical #7

Objective:- To implement the concept of SubQueries. SubQueries:- A subQuery is a form of an SQL statement that appears inside another SQL statement. It is also termed as a nested Query. The statement containing a subQuery is called a parent statement. The rows returned by the subQuery are used by the following statement.

It can be used by the following commands:

1. To insert records in the target table.
2. To create tables and insert records in this table.
3. To update records in the target table.
4. To create view.
5. To provide values for the condition in the WHERE, HAVING, IN, SELECT, UPDATE, and DELETE statements.

Exam:-

Creating clientmaster table from oldclient_master, table

Create table client_master

AS SELECT * FROM oldclient_master;

Using the Union, Intersect and Minus Clause:

Union Clause:

The user can put together multiple Queries and combine their output using the union clause. The union clause merges the output of two or more Queries into a single set of rows and columns. The final output of the union clause will be

Output: = Records only in Query one + records only in Query two + A single set of records which is common in both Queries.

Syntax:

```
SELECT columnname, columnname  
FROM tablename 1  
UNION  
SELECT columnname, columnname  
FROM tablename2;
```

Intersect Clause: The user can put together multiple Queries and their output using the intersect clause. The final output of the intersect clause will be :



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Output = A single set of records which are common in both Queries

Syntax:



```
SELECT columnname, columnname  
FROM tablename 1  
INTERSECT  
SELECT columnname, columnname  
FROM tablename 2;
```

MINUS CLAUSE:- The user can put together multiple Queries and combine their output
= records only in Query

one Syntax:

```
SELECT columnname, columnname  
FROM tablename ;  
MINUS  
SELECT columnname, columnname  
FROM tablename ;
```

Assignment NO.7

Objective: Answer the following Queries:

Question.

1. Find the product_no and description of non- moving products.
2. Find the customer name, address, city and pincode for the client who has placed order no "019001"
3. Find the client names who have placed order before the month of may 96.
4. Find out if product "1.44 Drive" is ordered by only client and print the client_no name to whom it was sold.
5. find the names of client who have placed orders worth Rs.10000 or more.
6. Select the orders placed by 'Rahul Desai'
7. Select the names of persons who are in Mr. Pradeep's department and who have also worked on an inventory control system.
8. Select all the clients and the salesman in the city of Bombay.
9. Select salesman name in "Bombay" who has atleast one client located at "Bombay"
10. Select the product_no, description, qty_on-hand, cost_price of non_moving items in the product_master table.



Theory and Concept

Practical # 8

Objective:- To implement the concept of Indexes and views.

Indexes- An index is an ordered list of content of a column or group of columns in a table. An index created on the single column of the table is called simple index. When multiple table columns are included in the index it is called composite index.

Creating an Index for a table:-

Syntax (Simple)

```
CREATE INDEX index_name  
ON tablename(column name);
```

Composite Index:-

```
CREATE INDEX index_name  
ON tablename(columnname, columnname);
```

Creating an Unique Index:-

```
CREATE UNIQUE INDEX indexfilename  
ON tablename(columnname);
```

Dropping Indexes:-

An index can be dropped by using DROP INDEX

SYNTAX:-

```
DROP INDEX indexfilename;
```

Views:-

Logical data is how we want to see the current data in our database. Physical data is how this data is actually placed in our database.

Views are masks placed upon tables. This allows the programmer to develop a method via which we can display predetermined data to users according to our desire.

Views may be created for the following reasons:

1. The DBA stores the views as a definition only. Hence there is no duplication of data.
2. Simplifies Queries.
3. Can be Queried as a base table itself.
4. Provides data security.
5. Avoids data redundancy.

Creation of Views:-

Syntax:-

```
CREATE VIEW viewname AS  
SELECT columnname, columnname  
FROM tablename  
WHERE columnname=expression_list;
```



Renaming the columns of a view:-

Syntax:-

```
CREATE VIEW viewname AS  
SELECT newcolumnname....  
FROM tablename  
WHERE columnname=expression_list;
```

Selecting a data set from a view-

Syntax:-

```
SELECT columnname, columnname  
FROM viewname  
WHERE search condition;
```

Destroying a view-

Syntax:-

```
DROP VIEW viewname;
```

Assignment No # 8

Objective: Answer the following Questions

- Q1. Create an index on the table client_master, field client_no.
- Q2. Create an index on the sales_order, field s_order_no.
- Q3. Create an composite index on the sales_order_details table for the columns s_order_no and product_no.
- Q4. Create an composite index ch_index on challan_header table for the columns challan no and s_order_no.
- Q5. Create an index on the table salesman_master, field salesman_no.
- Q6. Drop index ch_index on table challan_header.
- Q7. Create view on salesman_master whose sal_amt is less than 3500.



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- Q8. Create a view client_view on client_master and rename the columns as name, add1, add2, city, pcode, state respectively.
- Q9. Select the client names from client_view who lives in city 'Bombay'.
- Q10. Drop the view client_view.



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Frequently Asked Questions

- What is database?
- What is DBMS?
- What is a Database system?
- What are the Advantages and disadvantages of DBMS?
- What is a view? How it is related to data independence?
- What is E-R model?
- What is an Entity?
- What is an Entity set?
- What is DDL (Data Definition Language)?
- What is DML (Data Manipulation Language)?
- What is a query?
- What do you mean by Correlated subquery?
- What are the unary operations in Relational Algebra?
- Are the resulting relations of PRODUCT and JOIN operation the same?
- Define SQL and state the differences between SQL and other conventional programming Languages
- What is database Trigger?
- What are cursors give different types of cursors?
- What operator performs pattern matching?
- What operator tests column for the absence of data?
- Which command executes the contents of a specified file?
- What are the wildcards used for pattern matching?
- What are the privileges that can be granted on a table by a user to others?



- What command is used to get back the privileges offered by the GRANT command?
- Which system table contains information on constraints on all the tables created?
- What the difference is between TRUNCATE and DELETE commands?
- What will be the output of the following query? `SELECT DECODE(TRANSLATE('A','1234567890','1111111111'), '1','YES', 'NO');`
- What does the following query do? `SELECT SAL + NVL(COMM,0) FROM EMP;`
- Which date function is used to find the difference between two dates?
- Which function is used to find the largest integer less than or equal to a specific value?
- What is the use of CASCADE CONSTRAINTS?
- What is the use of DESC in SQL?



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