Laboratory Manual

For

Database Management System

(IT 502)

B.Tech (IT)

SEM V

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Faculty of Technology
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Sample Experiment

1 AIM: Introduction to Data Definition Language.

Problem Statement: An Organization has a database which maintains the records for the customer which places the order(s) through the salesmen. There can be more than one customer who places the order(s) through a single salesman or there can be single customer which places the order(s) through multiple salesmen. Create the database for this problem statement.

2 TOOLS/APPARATUS: Oracle9.0 SQL plus or higher version

3 STANDARD PROCEDURES:

3.1 Analyzing the Problem:

According to above problem statement, name the relation by identifying the noun and the associating relation (Relationship set) by identifying the verb.

Here, Customer sand Salesmen are noun so they are considered as Entity and Order is verb so it is considered as Relationship.

After assigning the name of the relation, identify the attributes for each of the relations. Also identify the primary key for each of the relation. Then draw E-R diagram.

3.2 Designing the Solution: E-R diagram

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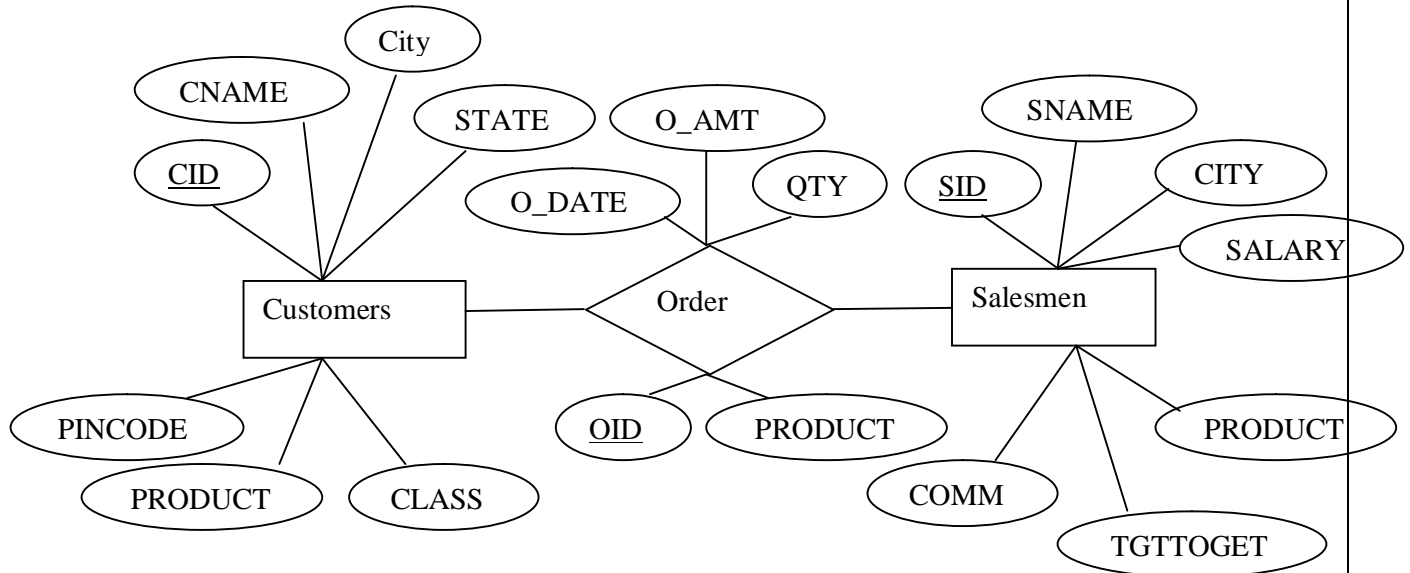
3.3 Implementing the Solution

3.3.1 Writing Source Code
CREATE TABLE CUSTOMERS
CREATE TABLE CUSTOMERS (CID VARCHAR2(5) PRIMARY KEY, CNAME VARCHAR2(20), CITY VARCHAR2(20), STATE VARCHAR2(15), PINCODE NUMBER(8), PRODUCT VARCHAR2(20), CLASS CHAR(1) DEFAULT 'A');
CREATE TABLE SALESMEN
CREATE TABLE SALESMEN (SID VARCHAR2(5) PRIMARY KEY, SNAME VARCHAR2(20), CITY VARCHAR2(15), SALARY NUMBER(5,2), PRODUCT VARCHAR2(20), TGTTOGET NUMBER(5,2), COMM NUMBER(5,2));
CREATE TABLE ORDER
CREATE TABLE ORDER1(OID VARCHAR2(5) PRIMARY KEY, CID VARCHAR2(5), SID VARCHAR2(5), PRODUCT VARCHAR2(20), QTY NUMBER(5), ODATE DATE , O_AMT NUMBER(8,2), FOREIGN KEY(CID) REFERENCES CUSTOMERS, FOREIGN KEY(SID) REFERENCES SALESMEN, CHECK (O_AMT >=0));
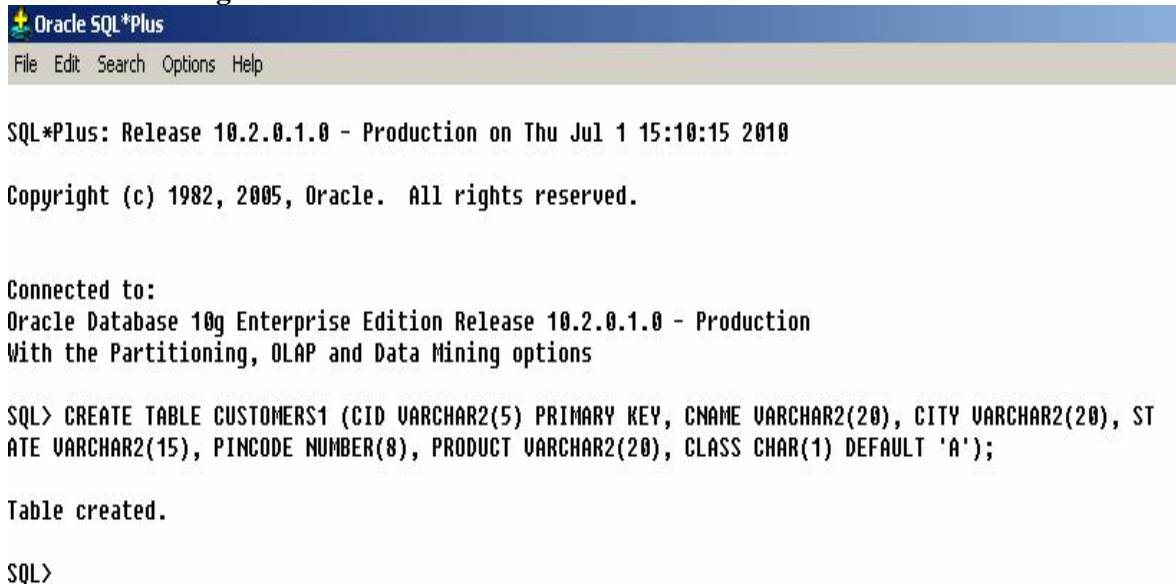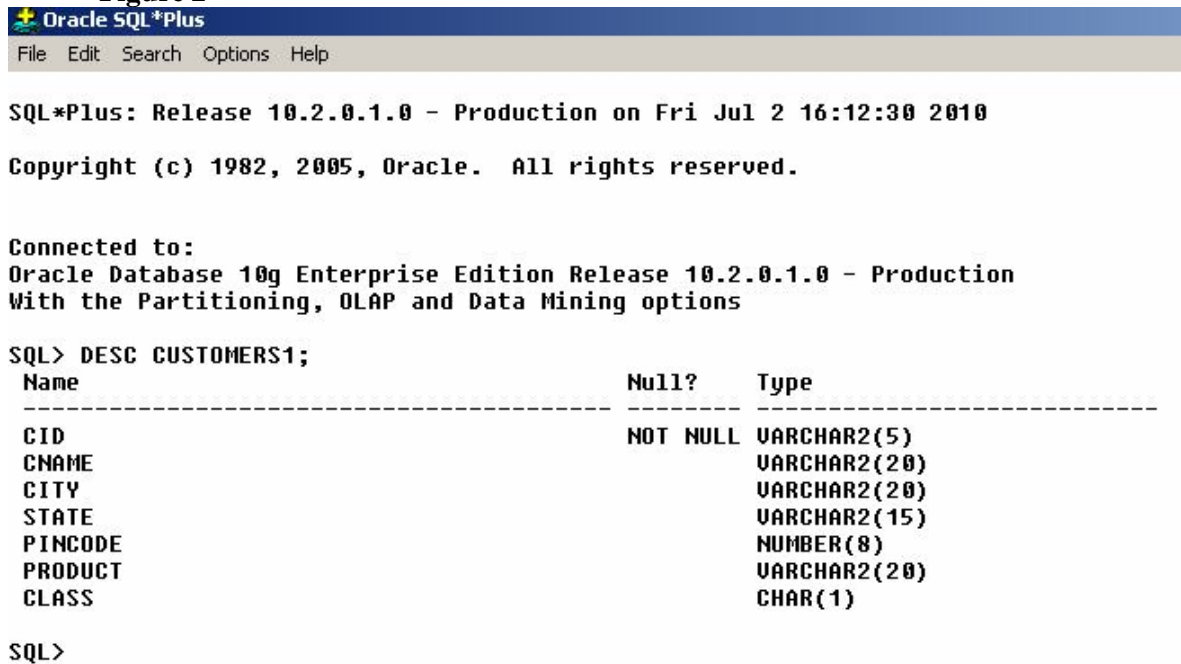
3.3.2 Compilation /Running and Debugging the Solution
Figure 1

```
Oracle SQL*Plus
File  Edit  Search  Options  Help

SQL*Plus: Release 10.2.0.1.0 - Production on Thu Jul 1 15:10:15 2010

Copyright (c) 1982, 2005, Oracle.  All rights reserved.


Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning, OLAP and Data Mining options

SQL> CREATE TABLE CUSTOMERS1 (CID VARCHAR2(5) PRIMARY KEY, CNAME VARCHAR2(20), CITY VARCHAR2(20), ST
ATE VARCHAR2(15), PINCODE NUMBER(8), PRODUCT VARCHAR2(20), CLASS CHAR(1) DEFAULT 'A');

Table created.

SQL>
```

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To see the table structure, type the command DESC <Table Name>;

Figure 2

```
Oracle SQL*Plus
File  Edit  Search  Options  Help

SQL*Plus: Release 10.2.0.1.0 - Production on Fri Jul 2 16:12:30 2010

Copyright (c) 1982, 2005, Oracle.  All rights reserved.


Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning, OLAP and Data Mining options

SQL> DESC CUSTOMERS1;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CID                                       NOT NULL VARCHAR2(5)
 CNAME                                              VARCHAR2(20)
 CITY                                               VARCHAR2(20)
 STATE                                              VARCHAR2(15)
 PINCODE                                            NUMBER(8)
 PRODUCT                                            VARCHAR2(20)
 CLASS                                              CHAR(1)

SQL>
```

3.4 Testing the Solution

OUTPUT IS: TABLE CREATED.

To see the table structure use desc command this will show the whole scheme.

3.5 Conclusion

Output is generated as shown in Figure 1.

To see the table structure, refer Figure 2.

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Required Software/ Software Tool

SQL plus (Oracle)

Editor (Notepad)

COMMON PROCEDURE

Step 1: Identify the relation for the data which is required to solve your query.

Step 2: Perform relational algebra queries as taught in the class.

Step 3: Find out appropriate command to set the result.

Step 4: Execute the query.

Step 5: To implement a procedure write the code in the editor (Notepad), copy it from notepad to SQL plus, enter / to compile your function. To execute your procedure write the command "exec procedurename ();" If procedurename contains argument then provide the argument at run time.

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EXPERIMENT - 1

Aim: Introduction to SQL, an exercise on data types in SQL & Data Definition Language commands.

- Create the following tables: [If already exists, DROP the existing table]

1) SALESMEN

Table Structure:

Field	Type	Constraint
SID	VARCHAR2 (5)	P.K.
SNAME	VARCHAR2 (20)	Not Null
CITY	VARCHAR2 (15)	Not Null
SALARY	NUMBER (5, 2)	
PRODUCT	VARCHAR2 (20)	
TGTTOGET	NUMBER (5,2)	
COMM	NUMBER (5,2)	

2) CUSTOMERS

Table Structure:

Field	Type	Constraint
CID	VARCHAR2 (5)	P.K.
CNAME	VARCHAR2 (20)	Not Null
CITY	VARCHAR2 (15)	Not Null
STATE	VARCHAR2 (15)	
PINCODE	NUMBER (8)	
PRODUCT	VARCHAR2 (20)	
CLASS	CHAR (1)	Default value 'A'

3) ORDERS

Table Structure:

Field	Type	Constraint
OID	VARCHAR2 (5)	P.K.
CID	VARCHAR2 (5)	F.K. (CUSTOMERS)
SID	VARCHAR2 (5)	F.K. (SALESPEOPLE)
PRODUCT	VARCHAR2 (20)	
QTY	NUMBER (5)	
ODATE	DATE	Not Null
O_AMT	NUMBER (8, 2)	Minimum zero

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EXPERIMENT – 2

Aim: Exercise on Data Manipulation Language and transaction control commands.
- Insert the following records : (Enter required data in empty columns)

Table 1→ SALESMEN

SID	SNAME	CITY	SALARY	PRODUCT	TGTTOGET	COMM
S101	Ajay Patel	Ahmedabad				1200
S102	Chintan Shah	Baroda				1500
S103	Vinay Mehra	Pune				1200
S104	Jay Pandey	Surat				800
S105	Jimit Dave	Mumbai				300
S106	Manan Gandhi	Ahmedabad				1200

Table 2 → CUSTOMERS

CID	CNAME	CITY	STATE	PINCODE	PRODUCT	CLASS
C301	Nirav Patel	Nadiad				B
C302	Kiran Dave	Delhi				A
C303	Sapan Shah	Bangalore				B
C304	Saurabh Mehta	Baroda				C
C305	Smriti Mishra	Ahmedabad				B
C306	Harshal Pandya	Mumbai				A
C307	Sunil Gandhi	Baroda				B
C308	Bimal Thakkar	Surat				C

Table 3 → ORDERS

OID	CID	SID	PRODUCT	QUANTITY	ODATE	O_AMT
O501	C302	S102			02-JAN-09	700000
O502	C301	S105			21-JAN-09	10000
O503	C308	S103			10-FEB-09	250000
O504	C306	S104			14-FEB-09	400000
O505	C306	S102			29-MAR-09	100000
O506	C303	S101			15-APR-09	90000.50
O507	C304	S105			24-JUN-09	7500.75
O508	C306	S101			27-SEP-09	900000
O509	C302	S102			21-DEC-09	205000
O510	C307	S102			30-DEC-09	27800
O511	C303	S104			31-DEC-09	15000

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- Solve the following queries :

→ Display all the information about each salesman with appropriate headings.
→ List all the salesmen that live outside the Gujarat.
→ Displays class 'A' customers with their id and name.
→ Add a new field as country in salesmen and customers table.
→ Change the name of the city whose name is Sunil Gandhi from customers table.
→ List the information of all the customers who are located in Baroda.
→ List the name of all the salesmen whose salary is greater than 2000.
→ Change the order amount for the order id O501.
→ Display order id and order date from orders table whose sales id is S102.

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EXPERIMENT – 3

Aim: Exercise on Types of Data Constraints.
→Add primary key and Foreign Key to the existing tables using alter table command.
→ Create cust table which contains cno having pk, cname and occupation where data values inserted for cno must start with the capital letter C and cname should be in upper case. Insert the correct values as well as display the error message for incorrect values.
→ Find out the name of all the salesmen having 'a' as the second letter in their names.
→ List all the information of customers whose state contains null value.
→ List all the information of customers in descending order according to their name.

EXPERIMENT – 4

Aim: Exercise on Joins (single-table or multi-table) and using normalization.
→ Display customer no, name, city and order amount.
→ Display salesman details with their order details.
→ Display customer info of salesman S102 and S105.
→ List the salesmen details along with customers names associated with them.

EXPERIMENT – 5

Aim: Exercise on group-by clause and date arithmetic.
→ Display order info with salesman name which has given on date before 10
   of any month.
→ Display minimum order amount of each sales man.
→ Display total order amount for each salesman.
→ Find the customer city of customer which order amount is minimum.

EXPERIMENT – 6

Aim: Exercise on different functions (aggregate, math and string)

→ Count the total number of orders.

→ Count the number of salesmen whose commission is greater than 500.

→ Find average order amount of each salesman.

→ Find out the orders whose order amount is more than 12000 and also find the new order amount as original order amount * 5.

→ Determine the minimum and maximum salary of the salesman and rename the title as "min_sal" and "max_sal" respectively.

→ Show the use of right and left justify string function.

→ Show use of floor and ceiling function.

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EXPERIMENT – 7

Aim: Exercise on different types of sub queries.
→ Display customer name which customer no is highest.
→ Display customer name whose salesman staying in Ahmedabad.
→ Display order info for which order taken earliest.

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EXPERIMENT – 8

Aim: Introduction to PL/SQL, Control Structures, Procedures and Functions, view.
→ Create a view which shows the detail of salesman with his salary. (Salesmanname, salary)
→ Write a program to find factorial from the given number.
Hint: Take the number in one procedure and pass it to the function which is calculating the factorial of a given number and returns the factorial to the calling procedure.

EXPERIMENT – 9

Aim: Introduction to triggers and cursors.
→ Write a trigger for overdraft facility.
→ Write a cursor for calculating income tax for the given employee table.
Emp (eid, ename, salary, incometax)

EXPERIMENT - 10 (Term Project)

Aim: Miniproject on designing and implementing one data base management system.

Contents of PROJECT REPORT

- Project Title
- Certificate
- Acknowledgement
- System Overview
    -- Current system
    -- Objectives of the proposed system
- Advantages of the Proposed system (over current)
- E.R.Diagram
    -- Entities
    -- Relationships
    --Mapping Constraints

- Database Schema/Table Definition
    -- Table Name
    -- Field Name
    -- Datatype
    -- Field size
    -- Constraint (e.g. autogenerated, primary key, foreign key)
    -- Validation (e.g. not null, default value)
- Implementation
- Output
- Future Enhancements of the system
- Bibliography

Note: From the 3rd lab reporting will be started for their project.

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EXPERIMENT – 11

Aim: Create a table called Area which contains two attributes radius and area. Write a program which will calculate the area of circle for different radius. Take value of radius from user, calculate it and then insert those values in the Area table through the program.

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EXPERIMENT – 12

Aim: Create user defined Exceptions. Write a program in which the ACCT table records the current balance for an account, which is updated whenever, any deposits or withdrawals takes place. If the withdrawal attempted is more than the current balance held in the account, a user defined exception is raised displaying an appropriate error message other wise perform the appropriate task.

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References

Reference books:

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    - Henry F.Korth and A.Silberschatz. 2nd Ed. McGraw-Hill 1991.
- An Introduction to Database Systems
    - C. J. Date
    - A. Kannan
    - S. Swamynathan
- Fundamentals of Database Systems
    - Elmasri
    - Navathe
- SQL, PL/SQL The programming language of Oracle
    - Ivan Bayross, BPB Publications

Reference Link:
- http://en.wikipedia.org/wiki/Database
- www.w3schools.com/sql

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