Assignment 1 - Distributed DBMS

Name - Rupdeep Saha
Roll Number - 1854045
Department - IT

Answer 1

To convert the given ER model to Relational model we have to map the entity sets to their corresponding tables and the attributes of the entity set become the attributes of the table. Therefore we create 2 tables : “student” and “course” having their respective attributes. We also create a 3rd table “enrolls” having the primary key columns of the 2 tables, “roll” and “cid” , and having an extra column “enroll_date”. “Roll” and “cid” become the foreign keys of “enrolls” table and they refer to their respective tables. (roll,cid) becomes primary key of “enrolls” table. We also give a check constraint on email column of “student” table such that each email should contain ‘@’.

---->Creating tables “student”, “course” and “enrolls” :-

```
SQL>create table student(name varchar(20), roll number(20) constraint pk1
primary key,email varchar(20) constraint ck1 check(email like '%_@_%._%'));
SQL>describe student;
SQL>create table course(cname varchar(20), cid varchar(20) constraint pk2
primary key);
SQL>describe course;
SQL>create table enrolls(roll number(20) constraint fk1 references student(roll),
cid varchar(20) constraint fk2 references course(cid), enroll_date date, constraint
pk3 primary key(roll,cid));
SQL>describe enrolls;
```

```
SQL> create table student(name varchar(20), roll number(20) constraint pk1 primary key,email varchar(20) constraint ck1 check(email like '%_@_%._%'));

Table created.

SQL> describe student;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 NAME                                               VARCHAR2(20)
 ROLL                                      NOT NULL NUMBER(20)
 EMAIL                                              VARCHAR2(20)

SQL> create table course(cname varchar(20), cid varchar(20) constraint pk2 primary key);

Table created.

SQL> describe course;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CNAME                                              VARCHAR2(20)
 CID                                       NOT NULL VARCHAR2(20)

SQL> create table enrolls(roll number(20) constraint fk1 references student(roll), cid varchar(20) constraint fk2 references course(cid), enroll_date
date, constraint pk3 primary key(roll,cid));

Table created.

SQL> describe enrolls;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 ROLL                                      NOT NULL NUMBER(20)
 CID                                       NOT NULL VARCHAR2(20)
 ENROLL_DATE                                        DATE

SQL>
```

-----> Inserting data in “student” table:-

SQL>insert into student values('Rahul',12,'r@gmail.com');
SQL>insert into student values('Raj',23,'ra@gmail.com');
--checking if check constraint on email is working or not:-
SQL>insert into student values('Rajkumar',30,'r.com');
SQL>select * from student;

```
SQL> insert into student values('Rahul',12,'r@gmail.com');

1 row created.

SQL> insert into student values('Raj',23,'ra@gmail.com');

1 row created.

SQL> insert into student values('Rajkumar',30,'r.com');
insert into student values('Rajkumar',30,'r.com')
*
ERROR at line 1:
ORA-02290: check constraint (RUPDEEP.CK1) violated


SQL> select * from student;

NAME                      ROLL EMAIL
-------------------- ---------- --------------------
Rahul                        12 r@gmail.com
Raj                          23 ra@gmail.com

SQL>
```

-----> Inserting data in “course” table:-

SQL>insert into course values('C++','C1');
SQL>insert into course values('Hadoop','C2');
SQL>select * from course;

```
SQL> insert into course values('C++','C1');

1 row created.

SQL> insert into course values('Hadoop','C2');

1 row created.

SQL> select * from course;

CNAME               CID
------------------- -------------------
C++                 C1
Hadoop              C2

SQL>
```

----> Inserting data in “enrolls” table:-

SQL>insert into enrolls values(12,'C1','2-JAN-20');
SQL>insert into enrolls values(12,'C2','5-JAN-20');
SQL>insert into enrolls values(23,'C1','3-JAN-20');
SQL>insert into enrolls values(23,'C2','5-JAN-20');
SQL>select * from enrolls;

```
SQL> insert into enrolls values(12,'C1','2-JAN-20');

1 row created.

SQL> insert into enrolls values(12,'C2','5-JAN-20');

1 row created.

SQL> insert into enrolls values(23,'C1','3-JAN-20');

1 row created.

SQL> insert into enrolls values(23,'C2','5-JAN-20');

1 row created.

SQL> select * from enrolls;

     ROLL CID                 ENROLL_D
---------- ------------------- --------
        12 C1                  02-01-20
        12 C2                  05-01-20
        23 C1                  03-01-20
        23 C2                  05-01-20

SQL>
```

The ER Model is successfully converted to Relational Model.

Answer 2

----> Creating the “client_master” table with the check constraint “column client_no must begin with ‘C’ ”:-

SQL>create table client_master(client_no varchar(20) constraint pk4 primary key,name varchar(20),balance number,constraint ck2 check(client_no like 'C%'));
SQL>describe client_master;

```
SQL> create table client_master(client_no varchar(20) constraint pk4 primary key,name varchar(20),balance number,constraint ck2 check(client_no like '
C%'));

Table created.

SQL> describe client_master;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CLIENT_NO                                 NOT NULL VARCHAR2(20)
 NAME                                               VARCHAR2(20)
 BALANCE                                            NUMBER
```

----> Creating table “auditclient”:-

SQL>create table auditclient(client_no varchar(20),name varchar(20),balance number,operation varchar(10),userid varchar(20),operation_date date);
SQL>describe auditclient;

```
SQL> create table auditclient(client_no varchar(20),name varchar(20),balance number,operation varchar(10),userid varchar(20),operation_date date);

Table created.

SQL> describe auditclient;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 CLIENT_NO                                          VARCHAR2(20)
 NAME                                               VARCHAR2(20)
 BALANCE                                            NUMBER
 OPERATION                                          VARCHAR2(10)
 USERID                                             VARCHAR2(20)
 OPERATION_DATE                                     DATE

SQL>
```

-----> Inserting data into “client_master” table:-

SQL>insert into client_master values('C1','Raj',20000);
SQL>insert into client_master values('C2','Rahul',80000);
--checking if check constraint on client_no is working or not:-
SQL>insert into client_master values('B1','Rajkumar',30000);
SQL>select * from client_master;

```
SQL> insert into client_master values('C1','Raj',20000);

1 row created.

SQL> insert into client_master values('C2','Rahul',80000);

1 row created.

SQL> insert into client_master values('B1','Rajkumar',30000);
insert into client_master values('B1','Rajkumar',30000)
*
ERROR at line 1:
ORA-02290: check constraint (RUPDEEP.CK2) violated


SQL> select * from client_master;

CLIENT_NO           NAME                  BALANCE
------------------- -------------------- ----------
C1                  Raj                       20000
C2                  Rahul                     80000

SQL>
```

-----> Creating trigger

SQL>create or replace trigger t1
after update or delete on client_master
for each row
declare
a varchar2(20);
b varchar2(20);
c number;
oper varchar2(10);
begin
if updating then
oper:='update';
end if;
if deleting then
oper:='delete';
end if;

a:= :old.client_no;
b:= :old.name;
c:= :old.balance;
insert into auditclient values(a,b,c,oper,user,sysdate);
end;
/