

**ELECTRICITY BILL MANAGEMENT SYSTEM**

**Course Name :** INTRODUCTION TO DATABASE

**Semester :** SPRING (2017-2018)

**Sec :** F

**Department :** CSE, SE & CSSE

**Group Member :** 4

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**Due Date :** 19/04/2018

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**01. INTRODUCTIONS:**

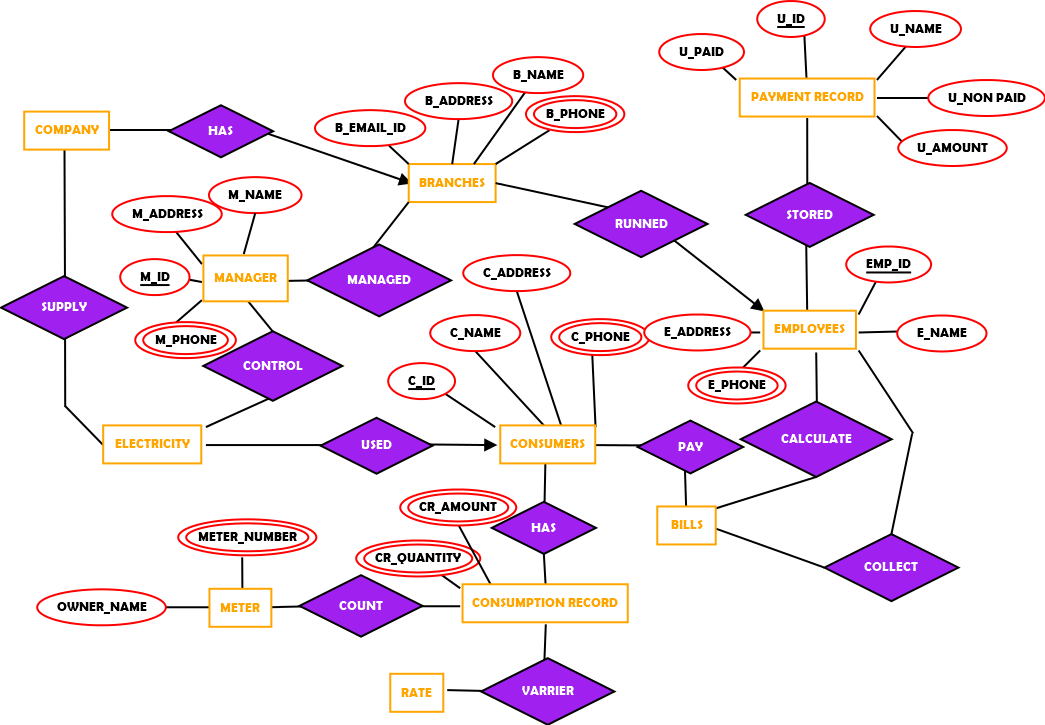
A database management system is system software for creating and managing database. The DBMS provide user and programmers with a systematic way to create, retrieve, update and manage data.

In this project, an Electricity Bill Management System is creating by the concept of DBMS. So, the main purpose of this project is to know about the basic concept of database management system.

**02. SCENARIO DESCRIPTIONS:**

An electricity supply company has many branches. Each branch has its own name, address, email id and phone number. Each branch is runes by employees. Employees are recognized by a unique id. Employee details containing name, phone number, address is also stored. Each branch is managed by a manager. A manager is identified by a manager id. Also, the name, address, phone number of each manager is stored. Company supply electricity. Also, manager controls the electricity. Electricity is used by consumers. Consumers are recognized by consumer id. Also, the name, address, phone of the consumers is stored. Each consumer has its own consumption record. Each consumption record consists of quantity and amount. Each consumption record is counted by a meter. Bill consumption record varies on rate. Each meter is identified by a meter number. Also, the meter owner name is stored in the system. Electricity bill is calculated by the employees of electricity supply company monthly from the meters. Consumers go to electricity supply office to pay the bill. Employees of the company collect the bills from the consumers. The bill payment record is also stored by the employees. Each payment record consists of user id, user name, amount, paid, non-paid.

**03. E-R DIAGRAMS:**



**04. NORMALZATION:**



**UNF:**

runned (b\_email\_id, b\_name, b\_address, b\_phone, emp\_id, e\_name, e\_address, e\_phone)

**1NF:**

b\_phone & e\_phone are multivalued attributes.

(b\_email\_id, b\_name, b\_address, b\_phone, emp\_id, e\_name, e\_address, e\_phone)

**2NF:**

(b\_email\_id, b\_name, b\_address, b\_phone)

(emp\_id, e\_name, e\_address, e\_phone)

**3NF:**

(b\_email\_id, b\_name)

(b\_address, b\_phone)

(emp\_id, e\_name)

(e\_address, e\_phone)

**BCNF:**

already in BCNF

(b\_email\_id, b\_name)

(b\_address, b\_phone)

(emp\_id, e\_name)

(e\_address, e\_phone)

**4NF:**

already in 4NF

(b\_email\_id, b\_name)

(b\_address, b\_phone)

(emp\_id, e\_name)

(e\_address, e\_phone)

**TABLE CREATING (RUNNED):**

(1) (b\_email\_id, b\_name, emp\_id)

(2) (b\_address, b\_phone, emp\_id)

(3) (emp\_id, e\_name)

(4) (e\_address, e\_phone, emp\_id)



**UNF:**

managed (b\_email\_id, b\_name, b\_address, b\_phone, m\_id, m\_name, m\_address, m\_phone)

**1NF:**

b\_phone & m\_phone are multivalued attributes

(b\_email\_id, b\_name, b\_address, b\_phone, m\_id, m\_name, m\_address, m\_phone)

**2NF:**

(b\_email\_id, b\_name, b\_address, b\_phone)

(m\_id, m\_name, m\_address, m\_phone)

**3NF:**

(b\_email\_id, b\_name)

(b\_address, b\_phone)

(m\_id, m\_name)

(m\_address, m\_phone)

**BCNF:**

already in BCNF

(b\_email\_id, b\_name)

(b\_address, b\_phone)

(m\_id, m\_name)

(m\_address, m\_phone)

**4NF:**

already in 4NF

(b\_email\_id, b\_name)

(b\_address, b\_phone)

(m\_id, m\_name)

(m\_address, m\_phone)

**TABLE CREATING (MANAGED):**

(1) (b\_email\_id, b\_name, m\_id)

(2) (b\_address, b\_phone, m\_id)

(3) (m\_id, m\_name)

(4) (m\_address, m\_phone, m\_id)



**UNF:**

stored (emp\_id, e\_name, e\_address, e\_phone, u\_id, u\_name, u\_amount, u\_paid, u\_unpaid)

**1NF:**

e\_phone is a multivalued attribute

(emp\_id, e\_name, e\_address, e\_phone, u\_id, u\_name, u\_amount, u\_paid, u\_unpaid)

**2NF:**

(emp\_id, e\_name, e\_address, e\_phone)

(u\_id, u\_name, u\_amount, u\_paid, u\_unpaid)

**3NF:**

(emp\_id, e\_name)

(e\_address, e\_phone)

(u\_id, u\_name)

(u\_amount, u\_paid, u\_unpaid)

**BCNF:**

already in BCNF

(emp\_id, e\_name)

(e\_address, e\_phone)

(u\_id, u\_name)

(u\_amount, u\_paid, u\_unpaid)

**4NF:**

already in 4NF

(emp\_id, e\_name)

(e\_address, e\_phone)

(u\_id, u\_name)

(u\_amount, u\_paid, u\_unpaid)

**TABLE CREATING (STORED):**

(1) (emp\_id, e\_name, u\_id)

(2) (e\_address, e\_phone, u\_id)

(3) (u\_id, u\_name, emp\_id)

(4) (u\_amount, u\_paid, u\_unpaid, u\_id)



**UNF:**

has (c\_id, c\_name, c\_address, c\_phone, cr\_amount, cr\_quantity)

**1NF:**

c\_phone, cr\_amount & cr\_quantity are multivalued attributes

(c\_id, c\_name, c\_address, c\_phone, cr\_amount, cr\_quantity)

**2NF:**

(c\_id, c\_name, c\_address, c\_phone)

(cr\_amount, cr\_quantity)

**3NF:**

(c\_id, c\_name)

(c\_address, c\_phone)

(cr\_amount, cr\_quantity)

**BCNF:**

already in BCNF

(c\_id, c\_name)

(c\_address, c\_phone)

(cr\_amount, cr\_quantity)

**4NF:**

already in 4NF

(c\_id, c\_name)

(c\_address, c\_phone)

(cr\_amount)

(cr\_quantity)

**TABLE CREATING (HAS):**

(1) (c\_id, c\_name)

(2) (c\_address, c\_phone, c\_id)

(3) (cr\_amount, cr\_id, c\_id)

(4) (cr\_quantity, cr\_id, c\_id)



**UNF:**

count (owner\_name, meter\_number, cr\_amount, cr\_quantity)

**1NF:**

meter\_number, cr\_amount, cr\_quantity are multivalued attributes

(owner\_name, meter\_number, cr\_amount, cr\_quantity)

**2NF:**

(owner\_name, meter\_number)

(cr\_amount, cr\_quantity)

**3NF:**

(owner\_name, meter\_number)

(cr\_amount, cr\_quantity)

**BCNF:**

already in BCNF

(owner\_name, meter\_number)

(cr\_amount, cr\_quantity)

**4NF:**

already in 4NF

(owner\_name, meter\_number)

(cr\_amount)

(cr\_quantity)

**TABLE CREATING (COUNT):**

(1) (owner\_name, meter\_number, cr\_id)

(2) (cr\_amount, cr\_id)

(3) (cr\_quantity, cr\_id)

**05. TABLE CREATIONS:**

(1) (b\_email\_id, b\_name, b\_address, b\_phone, emp\_id, m\_id)

Table name - **Branches**

(2) (emp\_id, e\_name, e\_address, e\_phone, u\_id)

Table name - **Employees**

(3) (m\_id, m\_name, m\_address, m\_phone)

Table name - **Manager**

(4) (u\_id, u\_name, u\_amount, u\_paid, u\_unpaid)

Table name - **Payment\_Record**

(5) (c\_id, c\_name, c\_address, c\_phone)

Table name - **Consumers**

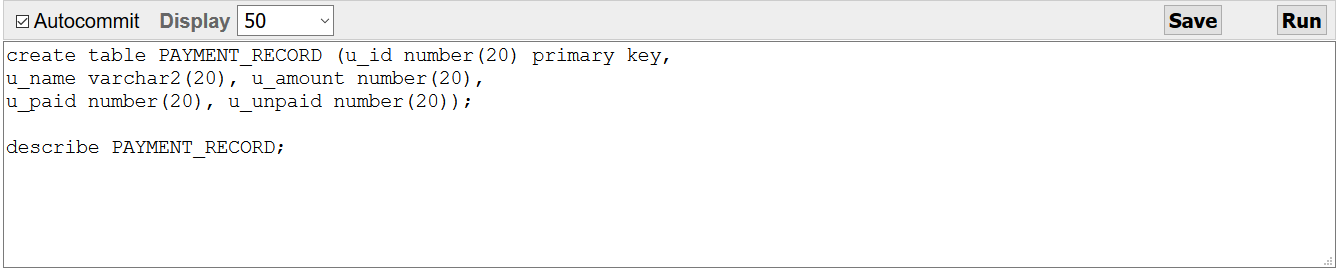
(6) (cr\_amount, cr\_id, cr\_quantity, c\_id)

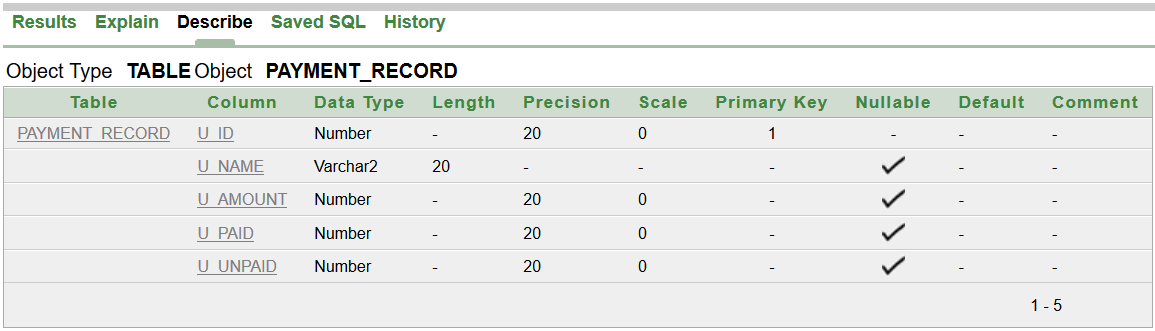
Table name - **Consumption\_Record**

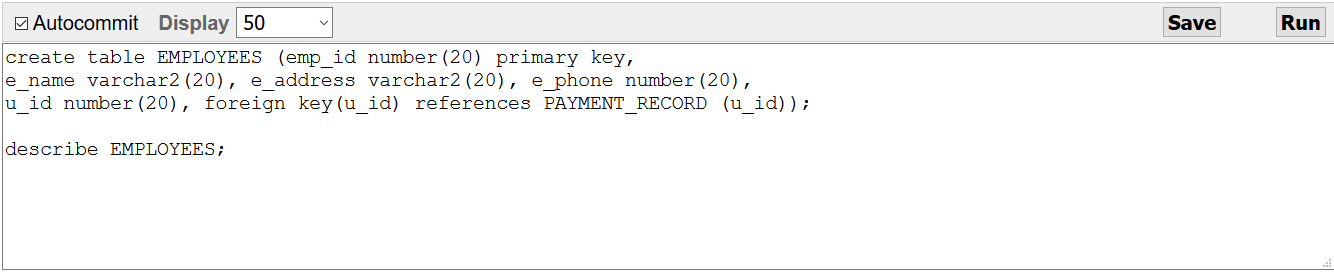
(7) (owner\_name, meter\_number, cr\_id)

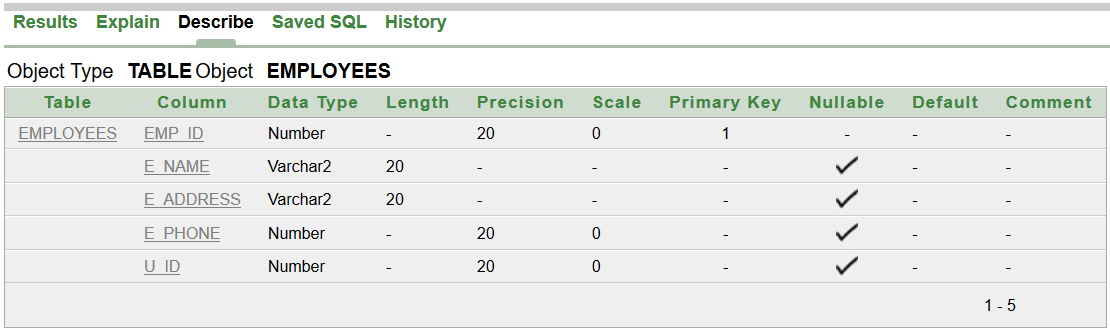
Table name - **Meter**

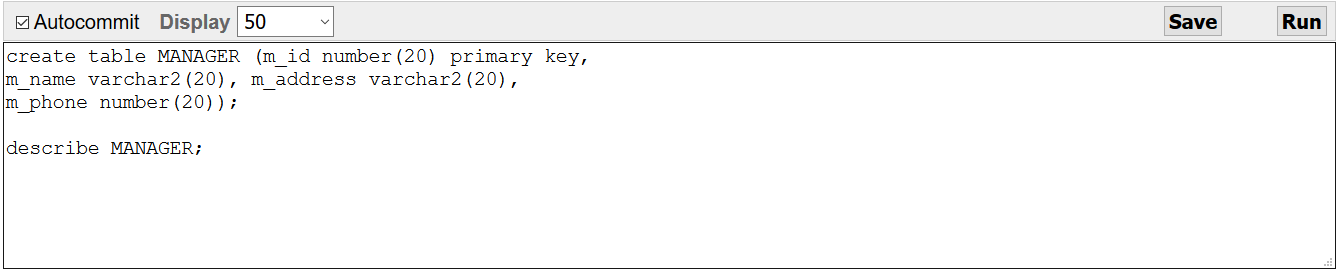
Screenshot of creating table using describe command:

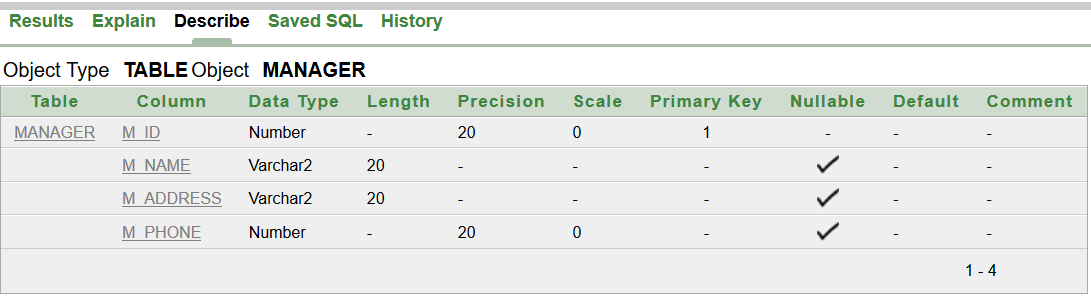


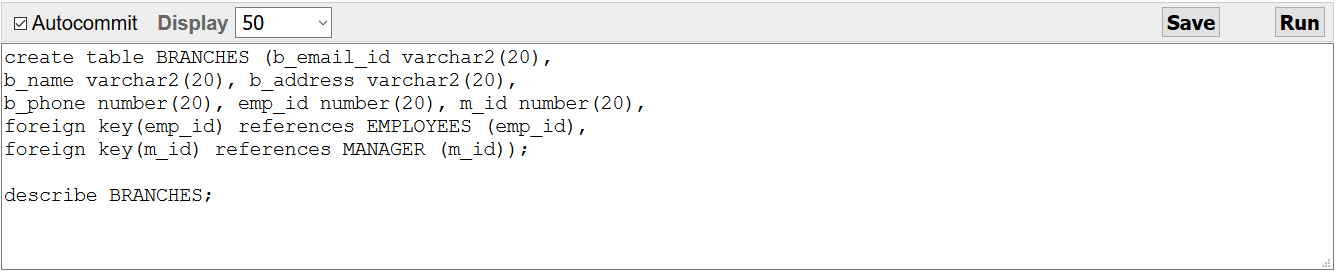


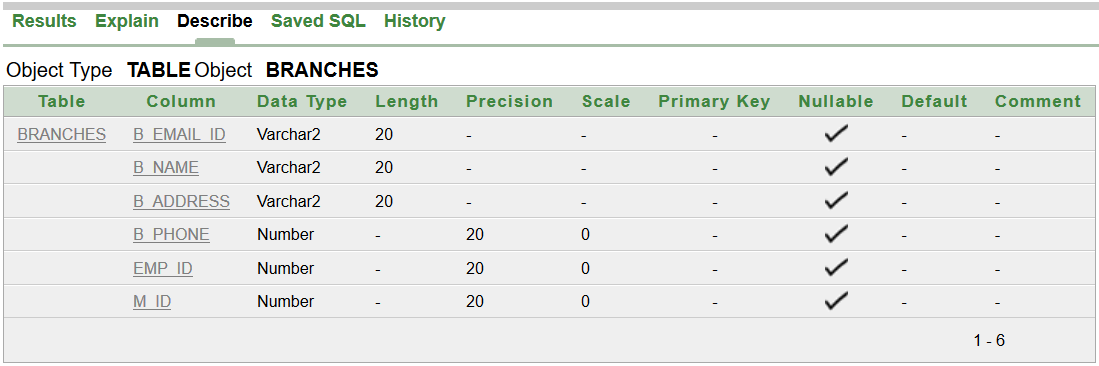


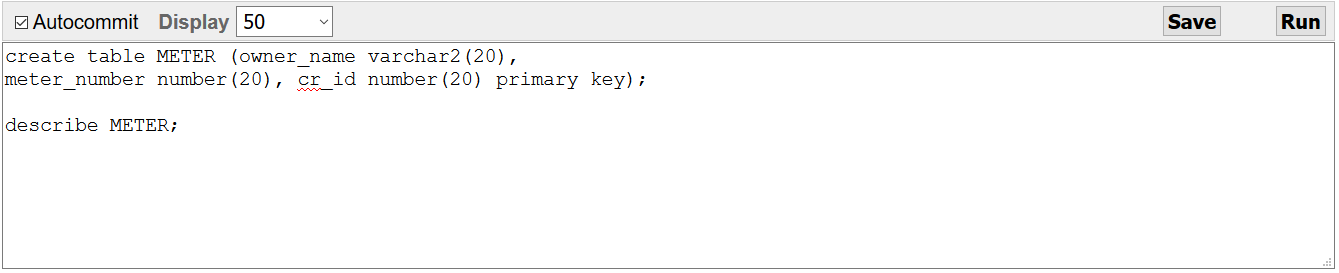


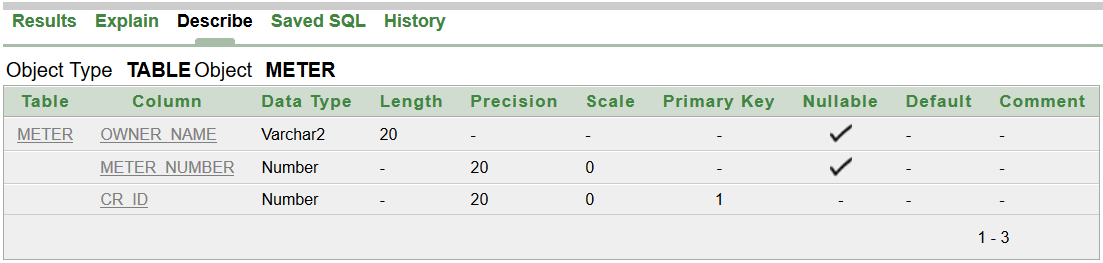


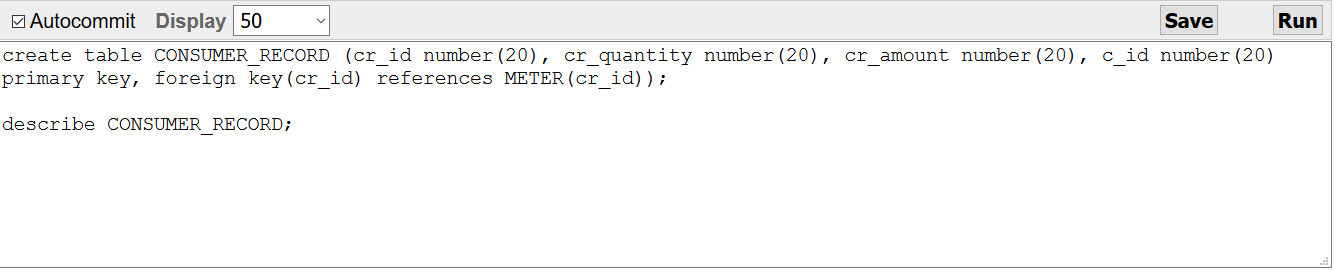


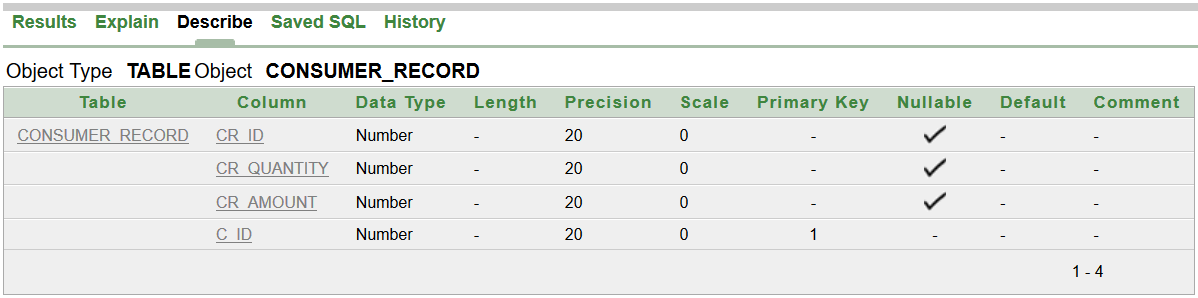


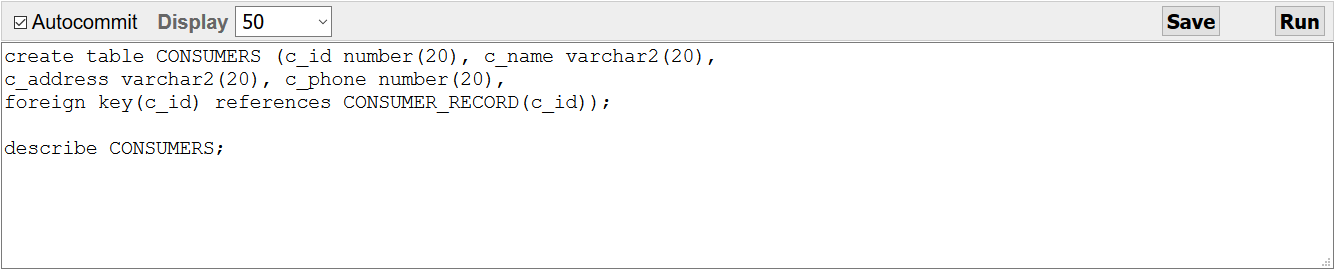


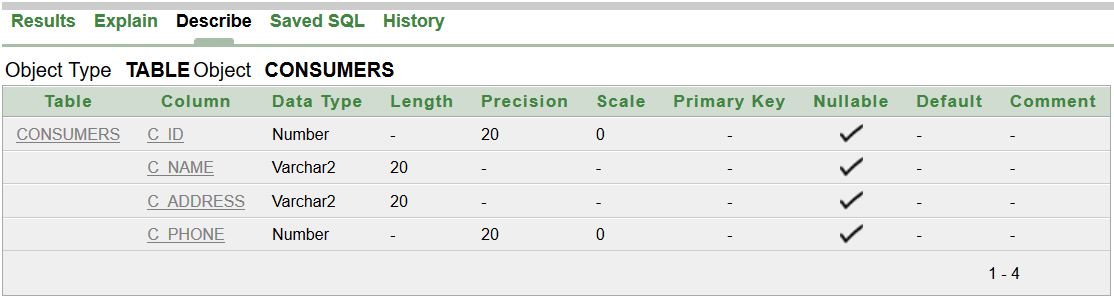












**06 ALTER WITH CONSTRAINTS:**

alter table EMPLOYEES add constraint u\_id foreign key(u\_id) references PAYMENT\_RECORD(u\_id);

alter table BRANCHES add constraint emp\_id foreign key(emp\_id) references EMPLOYEES(emp\_id);

alter table BRANCHES add constraint m\_id foreign key(m\_id) references MANAGER(m\_id);

alter table CONSUMER\_RECORD add constraint cr\_id foreign key(cr\_id) references METER(cr\_id);

alter table CONSUMERS add constraint c\_id foreign key(c\_id) references CONSUMER\_RECORD(c\_id);

**07 DATA INSERTIONS:**

Table – PAYMENT\_RECORD

insert into PAYMENT\_RECORD values (110,'Rahim',1500,1500,0);

insert into PAYMENT\_RECORD values (120,'Sabbir',1800,1200,600);

insert into PAYMENT\_RECORD values (130,'Smith',1000,950,50);

insert into PAYMENT\_RECORD values (140,'Tylor',5000,3200,1800);

insert into PAYMENT\_RECORD values (150,'Ruba',1400,1400,0);

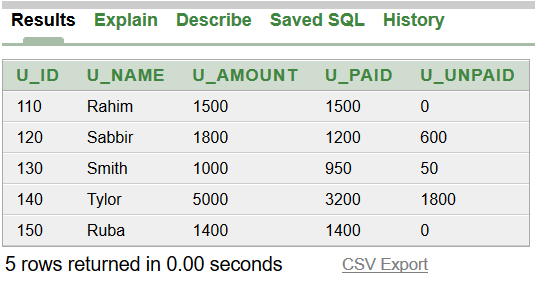


Table – EMPLOYEES

insert into EMPLOYEES values (1010,'John','Dhaka',62345,110);

insert into EMPLOYEES values (1020,'Rana','Chittagong',82945,120);

insert into EMPLOYEES values (1030,'Rasel','Khulna',81046,130);

insert into EMPLOYEES values (1040,'Andrew','Rajshahi',10086,140);

insert into EMPLOYEES values (1050,'Jerin','Sylhet',90153,150);

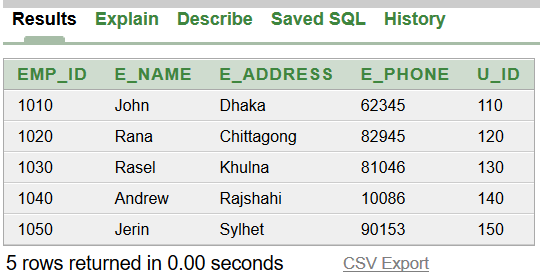


Table – MANAGER

insert into MANAGER values (91101,'Sohel','Dhaka',90222);

insert into MANAGER values (91201,'Roman','Chittagong',90333);

insert into MANAGER values (91301,'Roy','Khulna',90444);

insert into MANAGER values (91401,'Hasan','Rajshahi',90555);

insert into MANAGER values (91501,'Watson','Sylhet',90666);

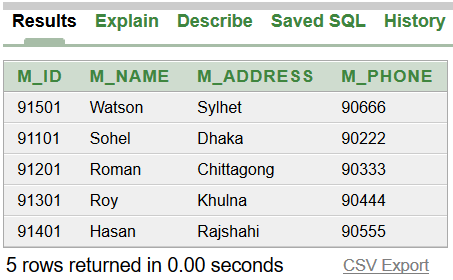


Table – BRANCHES

insert into BRANCHES values ('dhaka1@gmail.com','Dhaka Branch','Dhaka',02888, 1010, 91101);

insert into BRANCHES values ('chittagong@gmail.com','Chittagong Branch','Chittagong',03888, 1020, 91201);

insert into BRANCHES values ('khulna1@gmail.com','Khulna Branch','Khulna',04888, 1030, 91301);

insert into BRANCHES values ('rajshahi1@gmail.com','Rajshahi Branch','Rajshahi',05888, 1040, 91401);

insert into BRANCHES values ('sylhet1@gmail.com','Sylhet Branch','Rajshahi',06888, 1050, 91501);

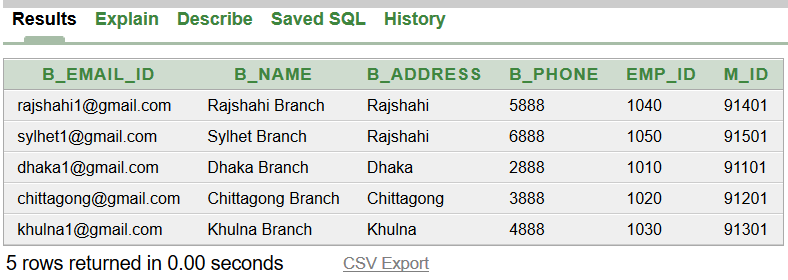


Table – METER

insert into METER values ('Rahim',5552431,998324);

insert into METER values ('Sabbir',6662431,992834);

insert into METER values ('Smith',7772431,994864);

insert into METER values ('Tylor',8882431,996664);

insert into METER values ('Ruba',9992431,998724);

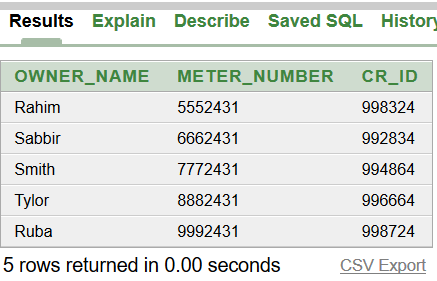


Table – CONSUMER\_RECORD

insert into CONSUMER\_RECORD values ('998324',3,15000,5882);

insert into CONSUMER\_RECORD values ('992834',5,18000,5782);

insert into CONSUMER\_RECORD values ('994864',2,10000,5682);

insert into CONSUMER\_RECORD values ('996664',8,50000,5582);

insert into CONSUMER\_RECORD values ('998724',3,14000,5482);

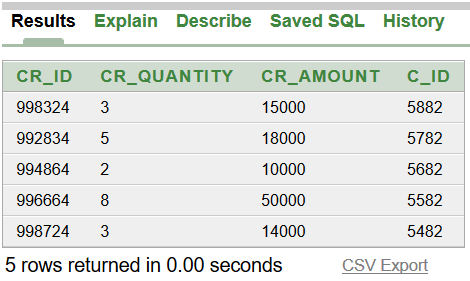


Table – CONSUMERS

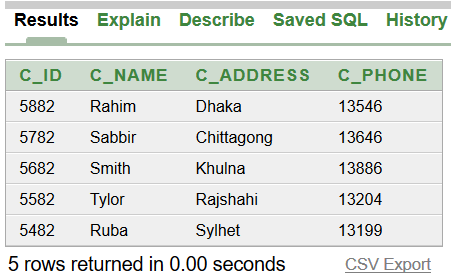
insert into CONSUMERS values (5882,'Rahim','Dhaka',13546);

insert into CONSUMERS values (5782,'Sabbir','Chittagong',13646);

insert into CONSUMERS values (5682,'Smith','Khulna',13886);

insert into CONSUMERS values (5582,'Tylor','Rajshahi',13204);

insert into CONSUMERS values (5482,'Ruba','Sylhet',13199);



**08 QUERIES WRITING:**

3 – Single Row Function:

Q: Display the user name, user amount, user paid and user unpaid for user Tylor.

A: SELECT u\_name, u\_amount, u\_paid, u\_unpaid from PAYMENT\_RECORD WHERE u\_name = 'Tylor';

Q: Display the employer name, address and phone number whose id is 1030.

A: SELECT e\_name, e\_address, e\_phone from EMPLOYEES WHERE emp\_id = 1030;

Q: Display the consumers name, id number and address whose phone number is 13199.

A: SELECT c\_id, c\_name, c\_address from CONSUMERS WHERE c\_phone = 13199;

3 – Group Function:

Q: Display the average, maximum, minimum and total amount from Payment Records.

A: SELECT AVG(u\_amount), MAX(u\_amount), MIN(u\_amount), SUM(u\_amount) from PAYMENT\_RECORD;

Q: Display the user id numers whome had paid more than 1300 from Payment Records.

A: SELECT u\_id, max(u\_paid) from PAYMENT\_RECORD group by u\_id having max(u\_paid)>1300;

Q: Display the user id numers whome had paid less than 1200 from Payment Records.

A: SELECT u\_id, max(u\_paid) from PAYMENT\_RECORD group by u\_id having max(u\_paid)<1450;

2 – Subquery:

Q: Display the cr\_id, cr\_quantity and c\_id where cr\_amount is more than 14000.

A: SELECT cr\_id, cr\_quantity, cr\_amount, c\_id from CONSUMER\_RECORD WHERE cr\_amount >

(SELECT cr\_amount from CONSUMER\_RECORD

WHERE c\_id=5482);

Q: Display the cr\_id, cr\_quantity and c\_id where cr\_amount is less than 1800.

A: SELECT cr\_id, cr\_quantity, cr\_amount, c\_id from CONSUMER\_RECORD WHERE cr\_amount <

(SELECT cr\_amount from CONSUMER\_RECORD

WHERE c\_id=5782);

2 – Joining:

Q: Display the Branches name, address, phone number and Employees name, address, phone number Equijoins with Employees Id.

A: SELECT b.b\_name, b.b\_address, b.b\_phone, b.emp\_id, e.emp\_id, e.e\_name, e.e\_address, e.e\_phone from BRANCHES b, EMPLOYEES e WHERE b.emp\_id = e.emp\_id;

Q: Display the Consumers name, address, phone number and Consumers amount, quantity Equijoins with Consumers Id.

A: SELECT c.c\_name, c.c\_address, c.c\_phone, c.c\_id, cr.c\_id, cr.cr\_amount, cr.cr\_quantity from CONSUMERS c, CONSUMER\_RECORD cr WHERE c.c\_id = cr.c\_id;

**09 CONCLUSIONS:**

After finishing the project, the basic concept of database management system is known to us. Now each of the group member will try to make any management system in future.