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**Security Guard Management System**

**Introduction:**

Best Security is a security guard company in Bangladesh which provides efficient and well-trained security personnel to its clients. Best Security uses a software application to record its guards, clients, owners along with other important information.

In out project we have used Database Management System.

**Case Study:**

Best security is owned by multiple owners. Owners will be defined by their unique owner id. Each owner has their name and phone number. The company, Best Security, which is owned by its owners will have its own unique name ‘Best Security’ along with the establish date. Best Security has recruited multiple security guards. However, each security can only be under Best Security. Security guards will be uniquely identified by guard id. Guards will also be consisted with first name, last name, age, date of birth, bonus, salary, phone number, hire date.  
Best Security, a security guard company can have contract with multiple clients. Clients will be identified uniquely with client id. Clients will also have client name, contract year which has a starting date and an ending date. After the contract security guards will be taken and instructed by their respective client. Each client can take and instruct multiple security guards and each guard will only provide service to only one client. If a client is not satisfied with a security personnel then that guard can be terminated by that client. For this reason, a starting date and an ending date will be recorded for each security guard. However, after the contract with Best Security, the ending date for each security guard will be up to the ending date of the contract with that client. Each security guard will have their job history which records their past activities. Job history includes security guards hire date along with their previous clients and history id uniquely. A client can be a large firm, so it can have many branches in different locations to operate and this indicates that those security guards who are instructed by their respective client will be posted to these locations. Security guards can be posted to a particular location for that client. Location will contain unique location id, postal code along with the client name, city name, and address which includes road number and street name. Client’s location must be located in a city. City will be uniquely identified by city id and also have the city name.

**Normalization:**

located: (city\_name, location\_id, postal\_code, cname, street\_name, road\_no, city\_id, city\_name)  
  
1nf: No multivalued attribute.  
  
2nf: city\_name, location\_id, postal\_code, cname, street\_name, road\_no, city\_id  
 city\_id, city\_name  
  
3nf: location\_id, cname, street\_name, road\_no, city\_id, tid  
 city\_id, city\_name  
 tid, city\_name, postal\_code  
  
table: location\_id, cname, street\_name, road\_no, city\_id, tid  
 city\_id, city\_name  
 tid, city\_name, postal\_code

record: (gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, hist\_id, hire\_date,  
 prev\_client)  
  
1nf: prev\_client, phone\_no are the multivalued attributes  
  
2nf: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, hist\_id  
 hist\_id, hire\_date, prev\_client  
  
3nf: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, hist\_id  
 hist\_id, hire\_date, prev\_client

table: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, hist\_id  
 hist\_id, hire\_date, prev\_client

own:(name, establish\_date, ow\_id, ow\_name, phone\_no)  
  
1nf: phone\_no is the multivalued attribute  
  
2nf: name, establish\_date,  
 ow\_id, ow\_name, phone\_no, name  
  
3nf: name, establish\_date,  
 ow\_id, ow\_name, phone\_no, name  
  
table: name, establish\_date  
 ow\_id, ow\_name, phone\_no, name

contract: (name, establish\_date, cid, cname, start\_date, end\_date)  
  
1nf: no multivalued attribute.  
  
2nf: name, establish\_date  
 cid, cname, start\_date, end\_date, name  
  
3nf: name, establish\_date  
 cid, cname, start\_date, end\_date, name  
  
table: name, establish\_date  
 cid, cname, start\_date, end\_date, name

recruit: (name, establish\_date, gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name)  
  
1nf: phone\_no is the multivalued attribute  
  
2nf: name, establish\_date  
 gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, name

3nf: name, establish\_date  
 gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, name  
  
table: name, establish\_date  
 gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, name

instruct: (gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, cid, cname,   
 start\_date, end\_date, grd\_start\_date, grd\_end\_date)  
  
1nf: phone\_no is the multivalued attribute  
  
2nf: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, cid   
 cid, cname, start\_date, end\_date  
 gc\_id, cid, gid, grd\_start\_date, grd\_end\_date  
  
3nf: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, cid   
 cid, cname, start\_date, end\_date  
 gc\_id, cid, gid, grd\_start\_date, grd\_end\_date  
  
table: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, cid  
 cid, cname, start\_date, end\_date  
 gc\_id, cid, gid, grd\_start\_date, grd\_end\_date

post: (gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, city\_name, location\_id,  
 postal\_code, cname, street\_name, road\_no)  
  
1nf: no multivalued attribute  
  
2nf: gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, location\_id  
 city\_name, location\_id, postal\_code, cname, street\_name, road\_no  
  
3nf: gid, dob, bonus, hire\_date, salary, phone\_no, location\_id, f\_name, l\_name  
 location\_id, cname, street\_name, road\_no, tid  
 tid, city\_name, postal\_code  
  
table: gid, dob, bonus, hire\_date, salary, phone\_no, location\_id, f\_name, l\_name  
 location\_id, cname, street\_name, road\_no, tid  
 tid, city\_name, postal\_code

**Total\_table:**

* location\_id, cname, street\_name, road\_no, city\_id, tid
* city\_id, city\_name
* ~~tid, city\_name, postal\_code~~
* gid, dob, bonus, hire\_date, salary, phone\_no, hist\_id, f\_name, l\_name
* hist\_id, hire\_date, prev\_client
* name, establish\_date
* ow\_id, ow\_name, phone\_no, name
* ~~name, establish\_date~~
* cid, cname, start\_date, end\_date, name
* ~~name, establish\_date~~
* gid, dob, bonus, hire\_date, salary, phone\_no, f\_name, l\_name, name
* gid, dob, bonus, l\_name, hire\_date, salary, phone\_no, f\_name, cid
* ~~cid, cname, start\_date, end\_date~~
* gc\_id, cid, gid, grd\_start\_date, grd\_end\_date
* gid, dob, bonus, hire\_date, salary, phone\_no, location\_id, f\_name, l\_name
* ~~location\_id, cname, street\_name, road\_no, tid~~
* tid, city\_name, postal\_code

**Final Table:**

* location\_id, cname, street\_name, road\_no, city\_id, tid
* city\_id, city\_name
* gid, dob, bonus, hire\_date, salary, phone\_no, hist\_id, f\_name, l\_name
* hist\_id, hire\_date, prev\_client
* name, establish\_date
* ow\_id, ow\_name, phone\_no, name
* cid, cname, start\_date, end\_date, name
* gid, dob, bonus, hire\_date, salary, phone\_no, f\_name, l\_name, name
* gid, dob, bonus, hire\_date, salary, phone\_no, f\_name, l\_name, cid
* gc\_id, cid, gid, grd\_start\_date, grd\_end\_date
* gid, dob, bonus, hire\_date, salary, phone\_no, location\_id, f\_name, l\_name
* tid, city\_name, postal\_code

**Table Creation:**

create table location\_1

(

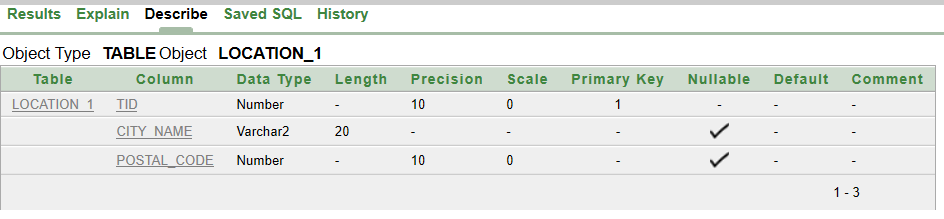
tid number(10),  
city\_name varchar2(20),

postal\_code number(10),

primary key(tid)

)

desc location\_1



create table city

(

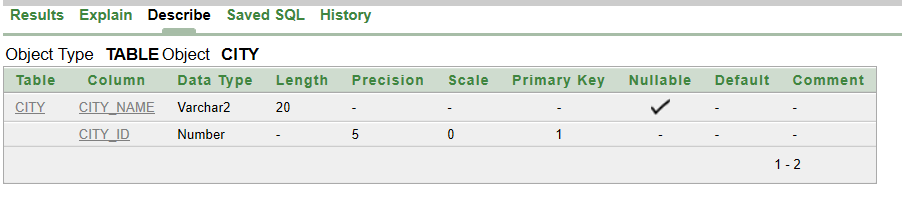
city\_name varchar2(20),

city\_id number(5),

primary key(city\_id)

)

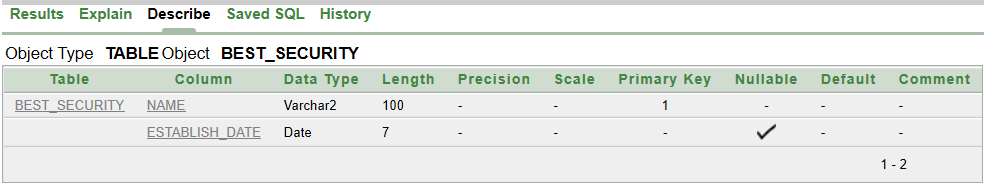
desc city



create table best\_security

(

name varchar2(100),  
establish\_date date,  
primary key (name)  
)  
  
desc best\_security



create table owner\_info

(

ow\_id number(5),

ow\_name varchar2(20),

phone\_no varchar2(25),

name varchar2(100),

primary key(ow\_id),

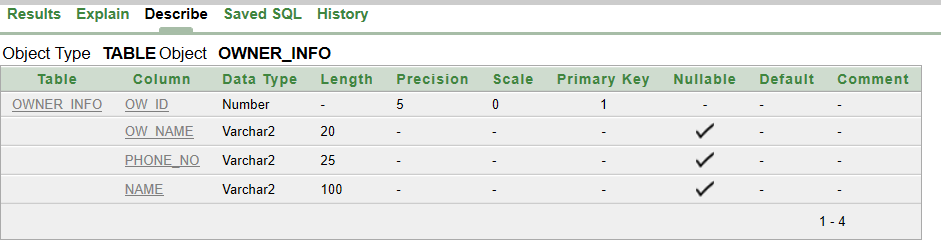
constraint best\_security\_primary\_key

foreign key (name)

references best\_security (name)

);

desc owner\_info

****

create table guard\_location

(

location\_id number(10),

cname varchar2(25),

street\_name varchar2(10),

road\_no number(10),

city\_id number(5),

tid number(10),

primary key(location\_id),

constraint location\_1\_primary\_key

foreign key (tid)

references location\_1 (tid),

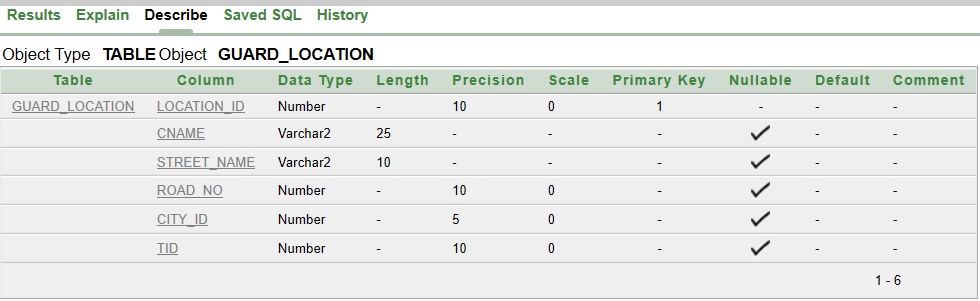
constraint city\_primary\_key

foreign key (city\_id)

references city (city\_id)

)

desc guard\_location



create table client\_info

(

cid number(10),

cname varchar2(25),

start\_date date,

end\_date date,

name varchar2(100),

primary key (cid),

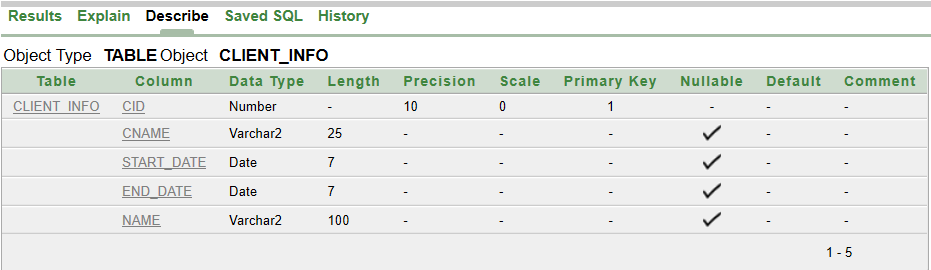
constraint best\_security\_2nd\_primary\_key

foreign key (name)

references best\_security (name)

)

desc client\_info



create table job\_histories

(

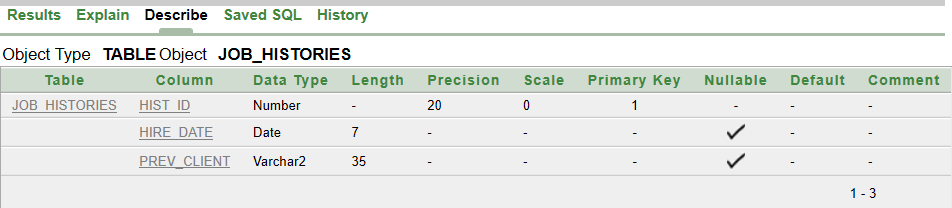
hist\_id number(20),

hire\_date date,

prev\_client varchar2(35),

primary key(hist\_id)

)  
desc job\_histories

****

create table guard\_info

(

gid number(5),

dob date,

bonus number(5),

hire\_date date,

salary number(5),

phone\_no varchar2(25),

hist\_id number(20),

f\_name varchar2(25),

l\_name varchar2(25),

primary key (gid),

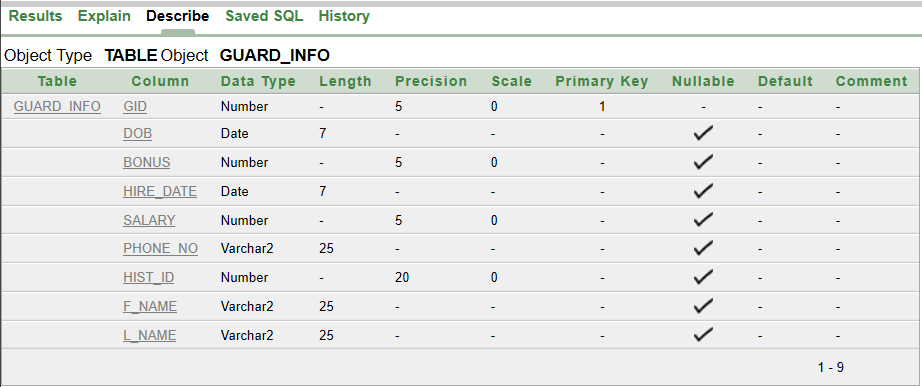
constraint job\_histories\_primary\_key

foreign key (hist\_id)

references job\_histories (hist\_id)

)

desc guard\_info

****

create table guard\_recruit

(

gid number(5),  
  
dob date,

bonus number(5),

hire\_date date,

salary number(5),

phone\_no varchar2(25),

name varchar2(100),

f\_name varchar2(25),

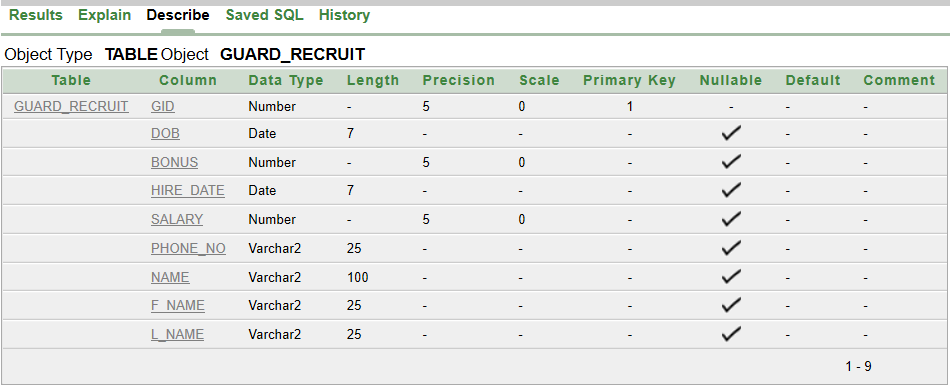
l\_name varchar2(25),

primary key (gid),

constraint best\_security\_3rd\_primary\_key

foreign key (name)

references best\_security (name)

)  
desc guard\_recruit  
  
  
  
create table guard\_instruct

(

gid number(5),

dob date,

bonus number(5),

hire\_date date,

salary number(5),

phone\_no varchar2(25),

cid number(10),

f\_name varchar2(25),

l\_name varchar2(25),

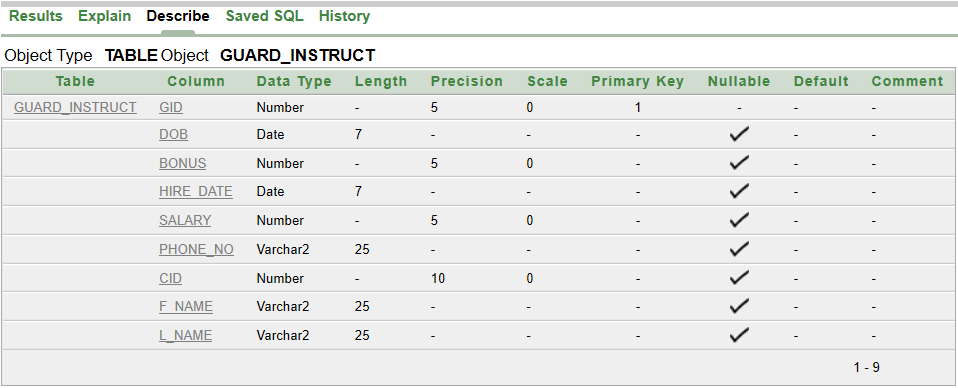
primary key (gid),

constraint client\_info\_primary\_key

foreign key (cid)

references client\_info (cid)

)  
desc guard\_instruct



create table guard\_post

(

gid number(5),

dob date,

bonus number(5),

hire\_date date,

salary number(5),

phone\_no varchar2(25),

location\_id number(10),

f\_name varchar2(25),

l\_name varchar2(25),

primary key (gid),

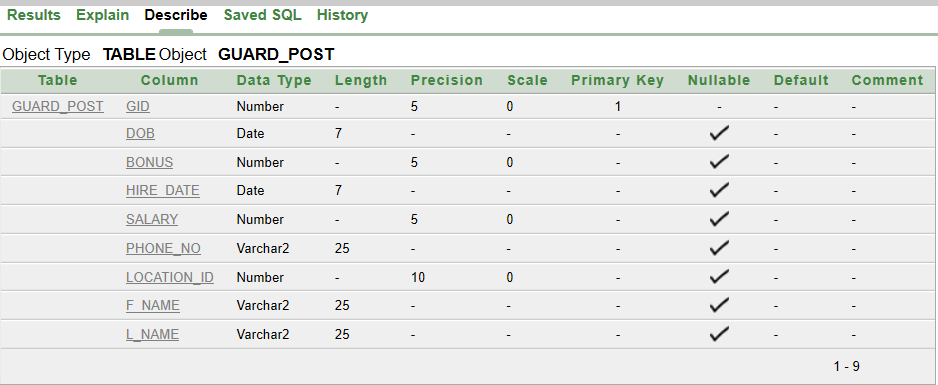
constraint guard\_location\_primary\_key

foreign key (location\_id)

references guard\_location (location\_id)

)

desc guard\_post



create table instruct

(

gc\_id number(5),

gid number(5),

cid number(10),

grd\_start\_date date,

grd\_end\_date date,

primary key (gc\_id),

constraint client\_info\_2nd\_primary\_key

foreign key (cid)

references client\_info (cid),

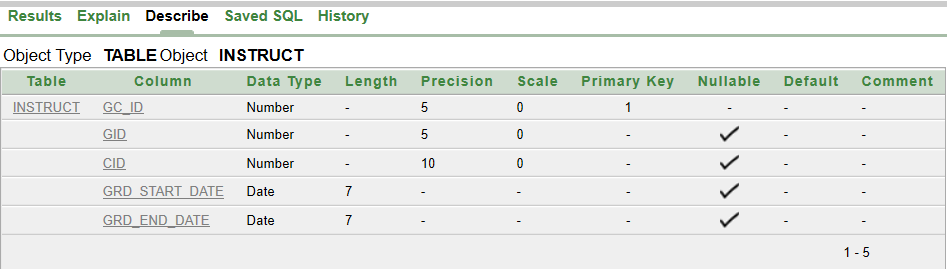
constraint guard\_instruct\_primary\_key

foreign key (gid)

references guard\_instruct (gid)

)

desc instruct



**Data Insertion:**

insert into location\_1

(tid, city\_name, postal\_code)

values (101,'Dhaka',1230)

insert into location\_1  
(tid, city\_name, postal\_code)  
values (102,'Khulna',1240)

insert into location\_1

(tid, city\_name, postal\_code)

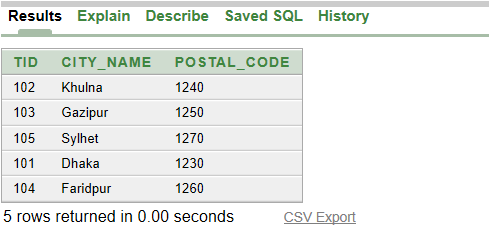
Values (103,'Gazipur',1250)

insert into location\_1

(tid, city\_name, postal\_code)

Values (104,'Faridpur',1260)

insert into location\_1  
(tid, city\_name, postal\_code)  
values (105,'Sylhet',1270)



insert into city

(city\_name,city\_id)

Values ('Dhaka',303)

insert into city

(city\_name,city\_id)

values('Khulna',304)

insert into city

(city\_name,city\_id)

Values ('Faridpur',305)

insert into city

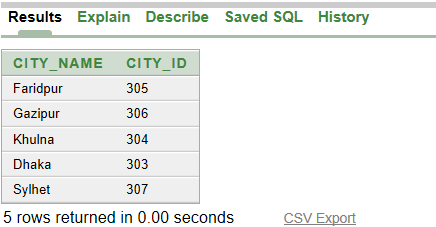
(city\_name,city\_id)

Values ('Gazipur',306)

insert into city

(city\_name,city\_id)

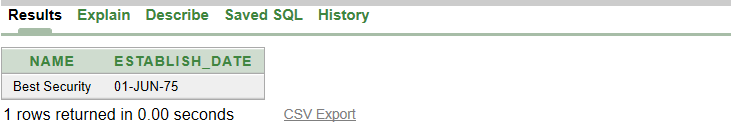
Values ('Sylhet',307)



insert into best\_security

(name, establish\_date)

values('Best Security', to\_date('01/06/1975', 'DD/MM/YYYY'))

****insert into owner\_info(ow\_id, ow\_name, phone\_no, name)

values(901, 'Mohammed Hanif', '00582579, 00582510', 'Best Security')

insert into owner\_info(ow\_id, ow\_name, phone\_no, name)

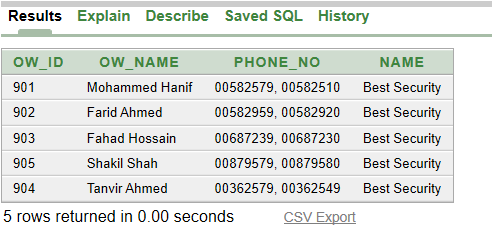
values(902, 'Farid Ahmed', '00582959, 00582920', 'Best Security')  
  
insert into owner\_info(ow\_id, ow\_name, phone\_no, name)

values(903, 'Fahad Hossain', '00687239, 00687230', 'Best Security')

insert into owner\_info(ow\_id, ow\_name, phone\_no, name)

values(904,'Tanvir Ahmed','00362579, 00362549', 'Best Security')  
  
insert into owner\_info(ow\_id, ow\_name, phone\_no, name)

values(905, 'Shakil Shah', '00879579, 00879580', 'Best Security')

****

insert into guard\_location

(location\_id,cname,street\_name,road\_no,city\_id,tid)

values(205,'Souteast Bank','Khalispur',02,304,102)

insert into guard\_location

(location\_id,cname,street\_name,road\_no,city\_id,tid)

values(204, 'Prime Bank','Naopara',02,307,105)

insert into guard\_location

(location\_id,cname,street\_name,road\_no,city\_id,tid)

values(201, 'City Bank','Gulshan',07,303,101)

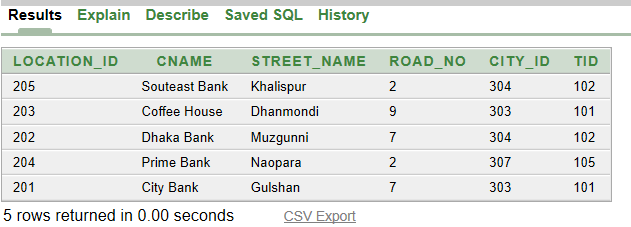
insert into guard\_location

(location\_id,cname,street\_name,road\_no,city\_id,tid)

values(202, ' Dhaka Bank’, 'Muzgunni',07,304,102)

insert into guard\_location

(location\_id,cname,street\_name,road\_no,city\_id,tid)

values(203, 'Coffee House','Dhanmondi',09,303,101)  
  


insert into client\_info

(cid, cname, start\_date, end\_date, name)

values(401,'Dhaka Bank', to\_date('01/JAN/2015', 'DD/MM/YYYY'),

to\_date('01/JAN/2025', 'DD/MM/YYYY'), 'Best Security')

insert into client\_info

(cid, cname, start\_date, end\_date, name)

values(403,'Prime Bank', to\_date('01/JUL/2014', 'DD/MM/YYYY'),

to\_date('01/JUN/2024', 'DD/MM/YYYY'), 'Best Security')

insert into client\_info

(cid, cname, start\_date, end\_date, name)

values(402,'City Bank', to\_date('01/JUL/2016', 'DD/MM/YYYY'),

to\_date('01/JUN/2026', 'DD/MM/YYYY'), 'Best Security')

insert into client\_info

(cid, cname, start\_date, end\_date, name)

values(404,'Southeast Bank', to\_date('01/JAN/2014', 'DD/MM/YYYY'),

to\_date('01/JUN/2022', 'DD/MM/YYYY'), 'Best Security')

insert into client\_info

(cid, cname, start\_date, end\_date, name)

values(405,'Coffee House', to\_date('01/JAN/2010', 'DD/MM/YYYY'),

to\_date('01/JAN/2022', 'DD/MM/YYYY'), 'Best Security')

****

insert into job\_histories

(hist\_id, hire\_date , prev\_client)

values (803,to\_date('17-JAN-2005', ‘DD/MM/YYYY’),'Gloria Jeans, ABC Cafe')

insert into job\_histories

(hist\_id, hire\_date , prev\_client)

values(801,to\_date('01-JAN-2004', 'DD/MM/YYYY'),'Jamuna Bank, ABC Cafe')

insert into job\_histories

(hist\_id, hire\_date , prev\_client)

values(802,to\_date('01-JUN-2008', 'DD/MM/YYYY'),'Jamuna Bank')

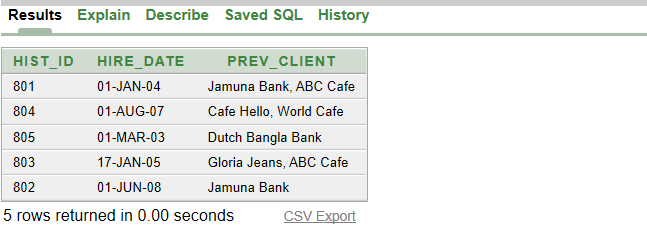
insert into job\_histories

(hist\_id, hire\_date , prev\_client)

values(804,to\_date('01-AUG-2007', 'DD/MM/YYYY'),'Cafe Hello, World Cafe')

insert into job\_histories

(hist\_id, hire\_date , prev\_client)

values(805,to\_date('01-MAR-2003', 'DD/MM/YYYY'),'Dutch Bangla Bank')   
  


insert into guard\_info

(gid, dob, hire\_date, salary, bonus, phone\_no, hist\_id , f\_name, l\_name)

values(501, to\_date('13/FEB/1981', 'DD/MM/YYYY'), to\_date('01/JAN/2000', 'DD/MM/YYYY'), 10000, 2000, '66442',801,'Alamin','Sheikh')

insert into guard\_info

(gid, dob, hire\_date, salary, bonus, phone\_no, hist\_id , f\_name, l\_name)

values(502, to\_date('19/FEB/1981', 'DD/MM/YYYY'), to\_date('21/MAY/2003', 'DD/MM/YYYY'), 12000, 3000, '66392',802,'Akash','Ahmed')

insert into guard\_info

(gid, dob, hire\_date, salary, bonus, phone\_no, hist\_id , f\_name, l\_name)

values(503, to\_date('29/AUG/1982', 'DD/MM/YYYY'), to\_date('01/SEP/2003', 'DD/MM/YYYY'), 11000, 2500, '66388',803,'Mohammad','Kaif')

insert into guard\_info

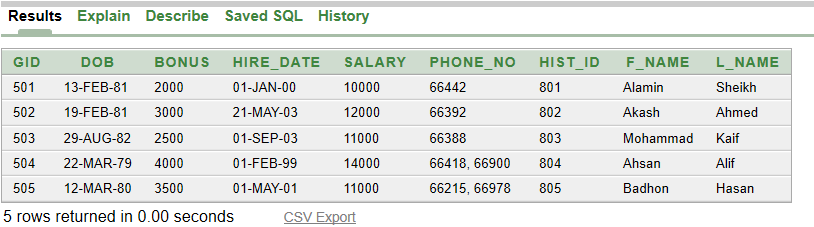
(gid, dob, hire\_date, salary, bonus, phone\_no, hist\_id , f\_name, l\_name)

values(504, to\_date('22/MAR/1979', 'DD/MM/YYYY'), to\_date('01/FEB/1999', 'DD/MM/YYYY'), 14000, 4000, '66418, 66900',804,'Ahsan','Alif')

insert into guard\_info

(gid, dob, hire\_date, salary, bonus, phone\_no, hist\_id , f\_name, l\_name)

values(505, to\_date('12/MAR/1980', 'DD/MM/YYYY'), to\_date('01/MAY/2001', 'DD/MM/YYYY'), 11000, 3500, '66215, 66978',805,'Badhon','Hasan')



insert into guard\_recruit

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, name)

values(501, to\_date('13/FEB/1981', 'DD/MM/YYYY'), to\_date('01/JAN/2000', 'DD/MM/YYYY'), 10000, 2000, '66442','Alamin','Sheikh', 'Best Security')

insert into guard\_recruit

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, name)

values(502, to\_date('19/FEB/1981', 'DD/MM/YYYY'), to\_date('21/MAY/2003', 'DD/MM/YYYY'), 12000, 3000, '66392','Akash','Ahmed', 'Best Security')

insert into guard\_recruit

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, name)

values(503, to\_date('29/AUG/1982', 'DD/MM/YYYY'), to\_date('01/SEP/2003', 'DD/MM/YYYY'), 11000, 2500, '66388','Mohammad','Kaif', 'Best Security')

insert into guard\_recruit

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, name)

values(504, to\_date('22/MAR/1979', 'DD/MM/YYYY'), to\_date('01/FEB/1999', 'DD/MM/YYYY'), 14000, 4000, '66418, 66900','Ahsan','Alif', 'Best Security')

insert into guard\_recruit

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, name)

values(505, to\_date('12/MAR/1980', 'DD/MM/YYYY'), to\_date('01/MAY/2001', 'DD/MM/YYYY'), 11000, 3500, '66215, 66978','Badhon','Hasan', 'Best Security')



insert into guard\_instruct

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, cid)

values(505, to\_date('12/MAR/1980', 'DD/MM/YYYY'), to\_date('01/MAY/2001', 'DD/MM/YYYY'), 11000, 3500, '66215, 66978','Badhon','Hasan', 401)

insert into guard\_instruct

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, cid)

values(501, to\_date('13/FEB/2000', 'DD/MM/YYYY'), to\_date('01/JAN/2000', 'DD/MM/YYYY'), 10000, 2000, '66442','Alamin','Sheikh', 401)

insert into guard\_instruct

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, cid)

values(502, to\_date('19/FEB/1981', 'DD/MM/YYYY'), to\_date('21/MAY/2003', 'DD/MM/YYYY'), 12000, 3000, '66392','Akash','Ahmed', 402)

insert into guard\_instruct

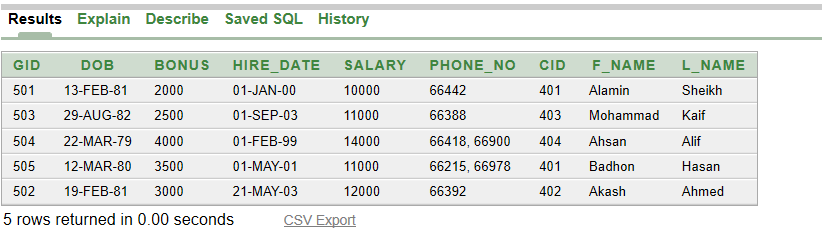
(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, cid)

values(503, to\_date('29/AUG/1982', 'DD/MM/YYYY'), to\_date('01/SEP/2003', 'DD/MM/YYYY'), 11000, 2500, '66388','Mohammad','Kaif', 403)

insert into guard\_instruct

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, cid)

values(504, to\_date('22/MAR/1979', 'DD/MM/YYYY'), to\_date('01/FEB/1999', 'DD/MM/YYYY'), 14000, 4000, '66418, 66900','Ahsan','Alif', 404)



insert into guard\_post

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, location\_id)

values (505, to\_date('12/MAR/1980', 'DD/MM/YYYY'), to\_date('01/MAY/2001', 'DD/MM/YYYY'), 11000, 3500, '66215, 66978','Badhon','Hasan', 202)

insert into guard\_post

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, location\_id)

values(501, to\_date('13/FEB/2000', 'DD/MM/YYYY'), to\_date('01/JAN/2000', 'DD/MM/YYYY'), 10000, 2000, '66442','Alamin','Sheikh', 202)

insert into guard\_post

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, location\_id)

values(502, to\_date('19/FEB/1981', 'DD/MM/YYYY'), to\_date('21/MAY/2003', 'DD/MM/YYYY'), 12000, 3000, '66392','Akash','Ahmed', 201)

insert into guard\_post

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, location\_id)

values(503, to\_date('29/AUG/1982', 'DD/MM/YYYY'), to\_date('01/SEP/2003', 'DD/MM/YYYY'), 11000, 2500, '66388','Mohammad','Kaif', 204)

insert into guard\_post

(gid, dob, hire\_date, salary, bonus, phone\_no, f\_name, l\_name, location\_id)

values(504, to\_date('22/MAR/1979', 'DD/MM/YYYY'), to\_date('01/FEB/1999', 'DD/MM/YYYY'), 14000, 4000, '66418, 66900','Ahsan','Alif', 205)



insert into instruct

(gc\_id, gid, grd\_start\_date, grd\_end\_date, cid)

values(705, 505, to\_date('01/MAR/2017', 'DD/MM/YYYY'), to\_date('01/JAN/2025', 'DD/MM/YYYY'), 401)

insert into instruct

(gc\_id, gid, grd\_start\_date, grd\_end\_date, cid)

values(701, 501, to\_date('01/FEB/2015', 'DD/MM/YYYY'), to\_date('01/JAN/2025', 'DD/MM/YYYY'), 401)

insert into instruct

(gc\_id, gid, grd\_start\_date, grd\_end\_date, cid)

values(702, 502, to\_date('01/AUG/2014', 'DD/MM/YYYY'), to\_date('01/JUN/2026', 'DD/MM/YYYY'), 402)

insert into instruct

(gc\_id, gid, grd\_start\_date, grd\_end\_date, cid)

values(703, 503, to\_date('01/AUG/2014', 'DD/MM/YYYY'), to\_date('01/JUN/2024', 'DD/MM/YYYY'), 403)

insert into instruct

(gc\_id, gid, grd\_start\_date, grd\_end\_date, cid)

values(704, 504, to\_date('01/MAR/2018', 'DD/MM/YYYY'), to\_date('01/JUN/2022', 'DD/MM/YYYY'), 404)



**Query Writing:**

Sub-Query:

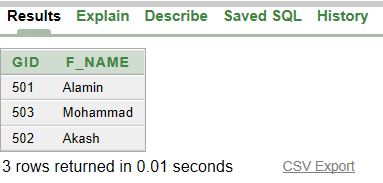
1. Display those security guards guard id and first name who get less bonus than the employee Badhon (first name).

Ans: select gid, f\_name from guard\_info

where bonus < any

(select bonus from guard\_info

where f\_name = 'Badhon')



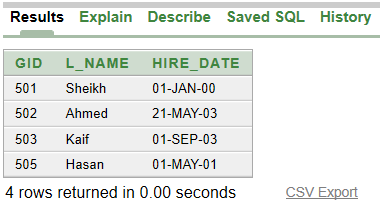
1. Display the guard id, last name and hire date for all guards who were hired after guard id 504.

Ans: select gid, l\_name, hire\_date from guard\_info

where hire\_date > any

(select hire\_date from guard\_info

where gid = 504)



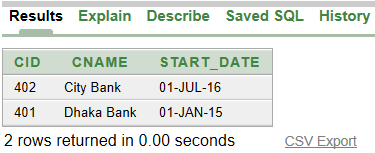
1. Display client id, client name and the start date of the contract with Best Security for all clients who were contracted(start date) after Prime Bank

Ans: select cid, cname, start\_date from client\_info

where start\_date > any

(select start\_date from client\_info

where cname = 'Prime Bank')



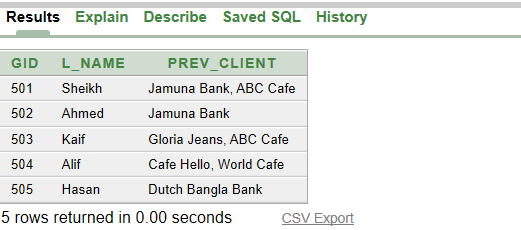
Joining:

1. Display the guard id, last name and previous clients for all guards.

Ans: select g.gid, g.l\_name, j.prev\_client

from guard\_info g, job\_histories j

where g.hist\_id = j.hist\_id

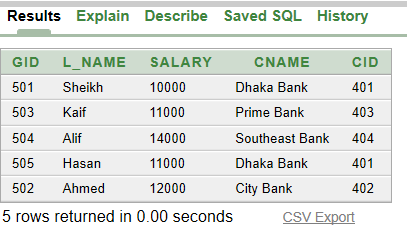


1. Display the guard id, last name salary, client name and client id for all guards

Ans: select g.gid, g.l\_name, g.salary, c.cname, c.cid

from guard\_instruct g, client\_info c

where g.cid = c.cid

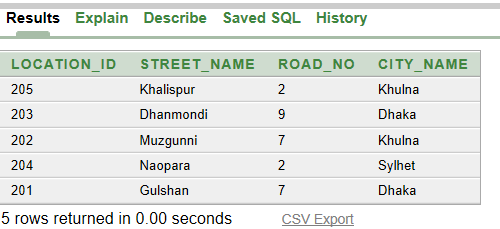


1. Display location id, street name, road number and city name for all guard located to its respective city.

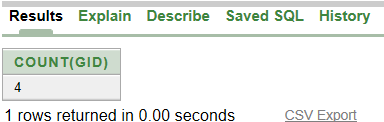
Ans: select gl.location\_id, gl.street\_name, gl.road\_no, c.city\_name

from guard\_location gl, city c

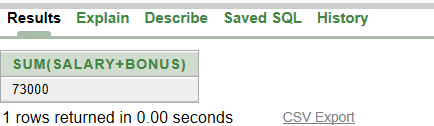
where gl.city\_id = c.city\_id



Group Function:

1. Show the number of security guard getting salary more than 10000.  
   Ans: select count(gid) from guard\_info where salary > 10000  
     
   
2. Show the sum of total salary along with bonus, paid to the security guards

Ans: select sum(salary + bonus) from guard\_info

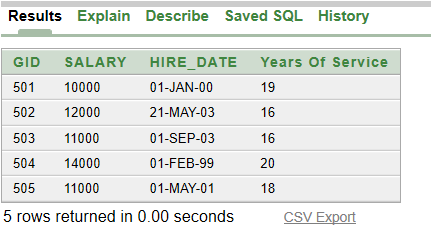


Single Row Function:

1. Display guard id, salary, hire date and the number of years in service for Best Security. Give appropriate column heading for it and round the figure

Ans: select gid, salary, hire\_date, trunc((sysdate-hire\_date)/365) as "Years of Service"

from guard\_info



View:

1. Create a view to show guards first name, last name, phone number and date of birth for all employees. Name the view as “guard\_personal\_info”.

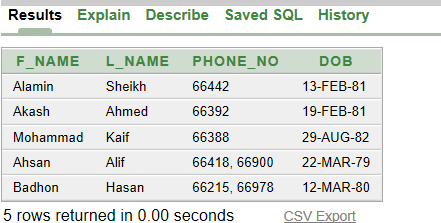
Ans: create or replace view guard\_personal\_info

as

select f\_name, l\_name, phone\_no, dob

from guard\_info

select \* from guard\_personal\_info



**Relational Algebra:**

Selection:

1. Find out all details of the owner whose owner id is 902  
   Ans: **σ**ow\_id = 902 (owner\_info)

Projection:

1. Find out owner name and phone number for all owners.

Ans: **∏**ow\_name, phone\_no(owner\_info)

Selection + Projection:

1. Find out history id and hire date for guard whose guard id is 501

Ans: **∏**hist\_id,hire\_date[**σ**gid=101(guard\_info)]

Selection + Projection and condition:

1. Find out guard id, first name and salary whose salary is greater than 11000

Ans: [**σ**salary > 11000 (guard\_info)]  
 **∏**gid, f\_name, salary

1. Find out client id and contract start date whose id is greater than 402  
   Ans: [**σ**gid > 402 (client\_info)]

**∏**cid, start\_date

Cartesian:

1. Find out guard id, first name, last name, previous client for all guards.

Ans: [**σ**guard\_info.hist\_id = job\_histories.hist\_id(guard\_info  
 Xjob\_histories)]

**∏**gid, f\_name, l\_name, prev\_client

1. Find out location location id, city id and city name
2. Ans: [**σ**guard\_location.cid = city.cid  (guard\_location X city)]  
    **∏**location\_id, city\_id, city\_name

Natural Join:

1. Find out guard id, first name, client name for all guards

Ans: **∏**gid, f\_name, cname(guard\_instruct ⋈ client\_info)

1. Find out guard id, bonus and city name for all guards.

Ans: **∏**gid,bonus,city\_name(guard\_post ⋈ location\_1)

Left outer Join:

1. Find out guard id, first name, client name for all guard along with those guards who don’t have any client.

Ans: **∏**gid,f\_name,cname(guard\_info ⟕ client\_info)

1. Find out guard id, date of birth for all guards along with those locations which don’t have any guard.

Ans: **∏**gid, dob, cname(guard\_location ⟕ guard\_post)

Right Outer Join:

1. Find out location id, street name along with those cities which have no common location id.

Ans: **∏**location\_id,street\_name(city ⟖ guard\_location)

1. Find out guard id and guard first name along with those guards who have no client

Ans: **∏**gid, f\_name(client\_info ⟖ guard\_instruct)

Full Outer Join:

1. Find out guard id and guard first name along with those guards who have no history id.

Ans: **∏**gid, f\_name(job\_histories ⟗ guard\_info)

1. Find out guard id, first name and also include those guards who are not posted to any location

Ans: **∏**gid,f\_name(guard\_location ⟗ guard\_post)

**Conclusion:**

There are thousands of guards recruited in Best Security. Since only five tuples are selected in this project, that is why many information are missing. For example, there are many guards who joined recently and did not get job history (job id). We have faced some difficulties when doing the Relational Algebra, the Right Outer Join and Full Outer Join. Since in this project we are showing very low amount of information, along with, we don’t have any “many-to-many” relationship, it was difficult for us to create proper Relational algebra since other common

In the guard\_instruct table, CID attribute contains only 4 distinct clients, but in client\_info table, the CID attribute contains 5. This means that the five-information given for guards only work for among 4 clients, and the other client that is missing in guard\_instruct table has other guards which is not mentioned in this “small” database.