

BUAN 6320.006
DATABASE FOUNDATIONS FOR
BUSINESS ANALYTICS

FINGERPRINT SERVICE SYSTEM

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1. Creation and use of Database:

```
2 • Create database ipaproject;
3 • use ipaproject;
```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
✓ 1	15:04:03	Create database ipaproject	1 row(s) affected	0.016 sec
✓ 2	15:04:09	use ipaproject	0 row(s) affected	0.000 sec

2. Creation of tables and addition of constraints:

(i) Applicant Entity (table):

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
5				
6				
7		CREATE TABLE Applicant (8 State_ID_Number INT(11) NOT NULL, 9 Full_Name CHAR(50), 10 Address CHAR(100), 11 Contact_Number_Mentioned_On_The_State_ID bigint(10), 12 State_Which_Issued_The_State_ID CHAR(50), 13 Age INT(3), 14 Schedule_Request_Confirmation_Number INT(11), 15 Social_Security_Number INT(11), 16 Ever_Been_Arrested CHAR(3) 17);		
18		alter table Applicant ADD constraint PK_State_ID PRIMARY KEY(State_ID_Number);		
19		alter table Applicant ADD Unique(Schedule_Request_Confirmation_Number);		
20		alter table Applicant ADD Unique (Social_Security_Number);		
21				
✓ 1	18:27:45	CREATE TABLE Applicant (State_ID_Number INT(11) NOT NULL, Full_Name CHAR(50),...	0 row(s) affected, 5 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.062 sec
✓ 2	18:27:47	alter table Applicant ADD constraint PK_State_ID PRIMARY KEY(State_ID_Number)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.203 sec
✓ 3	18:27:48	alter table Applicant ADD Unique(Schedule_Request_Confirmation_Number)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.078 sec
✓ 4	18:27:49	alter table Applicant ADD Unique (Social_Security_Number)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.031 sec

(ii) Portal for Authorities Entity (table):

```
88 • CREATE TABLE Portal_For_Authorities(  
89     Login_ID varchar(20),  
90     login_password varchar(16),  
91     Server_ID bigint(11));  
92 • alter table Portal_For_Authorities add constraint PK_Login_ID PRIMARY KEY (Login_ID);
```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	15:15:29	CREATE TABLE Portal_For_Authorities(Login_ID varchar(20), login_password varchar(16), Ser...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.015 sec
2	15:15:31	alter table Portal_For_Authorities add constraint PK_Login_ID PRIMARY KEY (Login_ID)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.046 sec

(iii) DPS Entity (table):

```
27 • CREATE TABLE DPS(  
28     Schedule_ID INT(11) not null,  
29     Service_Locations varchar(50) not null,  
30     State_ID_Number int(11),  
31     applicant_previously_owner_gun_license char(3),  
32     login_id varchar(50));  
33 • alter table DPS add constraint CPK_Schedule_ID primary key (Schedule_ID,Service_Locations);  
34 • alter table DPS add constraint FK_State_ID_Number foreign key (State_ID_Number) references Applicant(State_ID_Number);  
35 • alter table DPS add constraint FK_login_id foreign key (login_id) references portal_for_authorities(login_id);
```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	18:47:15	CREATE TABLE DPS(Schedule_ID INT(11) not null, Service_Locations varchar(50) not null, S...	0 row(s) affected, 2 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.063 sec
2	18:47:19	alter table DPS add constraint CPK_Schedule_ID primary key (Schedule_ID,Service_Locations)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.078 sec
3	18:47:20	alter table DPS add constraint FK_State_ID_Number foreign key (State_ID_Number) references...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.110 sec
4	18:47:22	alter table DPS add constraint FK_login_id foreign key (login_id) references portal_for_authortie...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.172 sec

(iv) Fingerprint_Card Entity (table):

```

37 • CREATE TABLE Fingerprint_Card (
38     Fingerprint_Card_Number INT(11),
39     Full_Name CHAR(50),
40     Alias CHAR(50),
41     Sex CHAR(10),
42     Race CHAR(15),
43     Date_Of_Birth DATE,
44     State_ID_Number INT(11) unique
45 );
46 • alter table Fingerprint_Card ADD constraint PK_Fingerprint_Card_Number PRIMARY KEY(Fingerprint_Card_Number);
47 • alter table Fingerprint_Card ADD constraint FK_Card_State_ID_Number foreign key(State_ID_Number) references Applicant(State_ID_Number);

```

Output

#	Time	Action	Message	Duration / Fetch
1	22:53:18	CREATE TABLE Fingerprint_Card (Fingerprint_Card_Number INT(11), Full_Name CHAR(50), Alias CHAR(50), Sex CHAR(10), Race CHAR(15), Date_Of_Birth DATE, State_ID_Number INT(11) unique);	0 row(s) affected, 2 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.062 sec
2	22:53:34	alter table Fingerprint_Card ADD constraint PK_Fingerprint_Card_Number PRIMARY KEY(Fingerprint_Card_Number);	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.187 sec
3	22:53:36	alter table Fingerprint_Card ADD constraint FK_Card_State_ID_Number foreign key(State_ID_Number) references Applicant(State_ID_Number);	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.172 sec

(v) Authorization Letter Entity (table):

```

49 • CREATE TABLE AUTHORIZATION_LETTER (
50     Schedule_Request_Confirmation_Number INT(11) not null,
51     Full_Name CHAR(50),
52     Signature VARCHAR(50)
53 );
54 • alter table AUTHORIZATION_LETTER ADD
55     constraint PK_Schedule_Request_Confirmation_Number PRIMARY KEY (Schedule_Request_Confirmation_Number);

```

Output

#	Time	Action	Message	Duration / Fetch
1	22:24:54	CREATE TABLE AUTHORIZATION_LETTER (Schedule_Request_Confirmation_Number INT(11) not null, Full_Name CHAR(50), Signature VARCHAR(50));	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.046 sec
2	22:24:57	alter table AUTHORIZATION_LETTER ADD constraint PK_Schedule_Request_Confirmation_Number PRIMARY KEY (Schedule_Request_Confirmation_Number);	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.188 sec

(vi) Gun Owners Entity (table):

```

57 • CREATE TABLE Gun_Owners(
58     Schedule_request_confirmation_number int(11),
59     current_gun_liscence_number int(11) not null unique,
60     current_gun_liscence_issue_date date,
61     current_gun_liscence_expiry_date date);
62 • alter table Gun_Owners add constraint PK_Schedule_request_confirmation_number primary key (Schedule_request_confirmation_number);
63

```

Output

#	Time	Action	Message	Duration / Fetch
1	22:57:36	CREATE TABLE Gun_Owners(Schedule_request_confirmation_number int(11), current_gun_lis... current_gun_liscence_expiry_date date);	0 row(s) affected, 2 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.079 sec
2	22:57:38	alter table Gun_Owners add constraint PK_Schedule_request_confirmation_number primary key (Schedule_request_confirmation_number);	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.078 sec

(vii) Proof of Residency Document Entity (table):

64	•	CREATE TABLE Proof_Of_Residency_Document(65 Bill_Number INT(11) NOT NULL, 66 Type_Of_Bill CHAR(50), 67 Full_Name CHAR(50), 68 Date_Mentioned_on_the_Bill DATE, 69 Address varchar(50) 70); 71	•	alter table Proof_Of_Residency_Document add constraint PK_Bill_Number PRIMARY KEY (Bill_Number);
Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	22:30:09	CREATE TABLE Proof_Of_Residency_Document(Bill_Number INT(11) NOT NULL, Type...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.063 sec
2	22:30:11	alter table Proof_Of_Residency_Document add constraint PK_Bill_Number PRIMARY KEY (Bill_...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.110 sec

(viii) Service locations Entity (table):

```

73 • CREATE TABLE Service_Locations(
74     Service_Code int(11),
75     Service_Locations varchar(50),
76     Schedule_ID int(11),
77     Contact_Number_mentioned_on_the_state_ID int(11),
78     Date_of_service date,
79     tax_id int(11) unique,
80     cheque_id int(11) unique,
81     bank_information char(50),
82     payment_confirmation_number int (11) unique,
83     login_id varchar(20) unique,
84     fingerprint_confirmation_number int (11) unique,
85     reason_for_denial_of_application_request_if_apply char(50));
86 • alter table Service_Locations add constraint PK_Service_Code primary key (Service_Code);
87 • alter table Service_Locations add constraint FK_Service_Locations foreign key (Schedule_ID,Service_Locations) references DPS(Schedule_ID,Service_Locations);
88 • alter table Service_Locations add constraint FK_Service_Login_ID foreign key (Login_ID) references Portal_For_Authorities(Login_ID);

```

Output

 Action Output

#	Time	Action	Message	Duration / Fetch
1	23:01:30	CREATE TABLE Service_Locations(Service_Code int(11), Service_Locations varchar(50), Sch...	0 row(s) affected, 7 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.109 sec
2	23:01:32	alter table Service_Locations add constraint PK_Service_Code primary key (Service_Code)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.094 sec
3	23:01:33	alter table Service_Locations add constraint FK_Service_Locations foreign key (Schedule_ID,S...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.156 sec
4	23:01:34	alter table Service_Locations add constraint FK_Service_Login_ID foreign key (Login_ID) refere...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.141 sec

(ix) Local Database of Service Location Entity (table):

99	•	CREATE TABLE Local_Database_of_Service_Location(100 Server_ID int(11), 101 Date_of_Fingerprint_Service date, 102 Gun_Owner_Driver_Liscense_Number int(11) not null unique, 103 Gun_Owner_Driver_Liscense_Issue_Date date, 104 Gun_Owner_Driver_Liscense_Expiry_Date date, 105 Restriction_Of_Any_Gun_Owner_If_Any char(50), 106 Gun_Owner_Height decimal(4,2), 107 Gun_Owner_Sex varchar(4), 108 Gun_Owner_Eyes_Color varchar(7)); 109	•	alter table Local_Database_of_Service_Location add constraint PK_Server_ID primary key (Server_ID);
----	---	---	---	---

(x) Applicants for refund Entity (table):

90	•	CREATE TABLE Applicants_For_Refund(
91		Schedule_ID int(11),
92		Cheque_ID varchar(50) unique,
93		Amount_which_was_paid decimal(4,2),
94		Reason_for_refund_request varchar(50),
95		Date_on_which_refund_request_made date,
96		Payment_Date date);
97	•	alter table Applicants_for_refund add constraint PK_Schedule_ID primary key (Schedule_ID);

Output

Action Output

#	Time	Action	Message	Duration / Fetch
1	23:06:51	CREATE TABLE Applicants_For_Refund(Schedule_ID int(11), Cheque_ID varchar(50) unique, ...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in ...	0.062 sec
2	23:06:53	alter table Applicants_for_refund add constraint PK_Schedule_ID primary key (Schedule_ID)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.094 sec

3. Insertion of entries in tables:

(i) Applicant Entity (table):

3	•	Insert into Applicant values (1000341,'David Olivia','7912 Grant Court,San Antonio,TX 78201',2103469088,'Texas',16,123156,684165313,'No');
4	•	Insert into Applicant values (9841651,'Noah Amelia','8685 Magnolia St.,Ottawa, IL 61350',7799232348,'Illinois',27,684651,641654985,'No');
5	•	Insert into Applicant values (6846151,'Christopher Nolan','808 Overlook Dr.,Fort Worth,TX 76110',8179262551,'Texas',54,651494,135516849,'No');
6	•	Insert into Applicant values (5615235,'Nathan Drake','1 Nicolls Rd.,Houston, TX 77088',2817351223,'Texas',24,354981,651684651,'No');
7	•	Insert into Applicant values (1231651,'Jadyn Garcia','8425 Schoolhouse Drive,Houston, TX 77024',2819148822,'Texas',33,164894,235468439,'No');
8	•	Insert into Applicant values (4561231,'Josh Rodriguez','80 N. Surrey Court Apt J,Owings Mills, MD 21117',4109242900,'Maryland',29,984651,788165138,'No');
9	•	Insert into Applicant values (7894153,'Kevin Lin','9985 Gregory Avenue,Houston, TX 77057',2817638768,'Texas',44,984151,984151310,'No');
10	•	Insert into Applicant values (2313216,'Isabella Chen','260 Glenridge Dr.,West Bloomfield, MI 48322',2489232348,'Michigan',78,684165,561513216,'No');
11	•	Insert into Applicant values (9615132,'Andrew Sophia','15 Blackburn Avenue,Austin, TX 78744',5122942200,'Texas',61,321351,654132013,'No');
12	•	Insert into Applicant values (4561321,'William Shakespeare','105 Creekside St.,Austin, TX 78749',5126980422,'Texas',26,334654,849415313,'No');

Output

Action Output

#	Time	Action	Message	Duration / Fetch
1	15:20:05	Insert into Applicant values (1000341,'David Olivia','7912 Grant Court,San Antonio,TX 78201',2...	1 row(s) affected	0.203 sec
2	15:20:06	Insert into Applicant values (9841651,'Noah Amelia','8685 Magnolia St.,Ottawa, IL 61350',7799...	1 row(s) affected	0.016 sec
3	15:20:08	Insert into Applicant values (6846151,'Christopher Nolan','808 Overlook Dr.,Fort Worth,TX 7611...	1 row(s) affected	0.000 sec
4	15:20:08	Insert into Applicant values (5615235,'Nathan Drake','1 Nicolls Rd.,Houston, TX 77088',281735...	1 row(s) affected	0.016 sec
5	15:20:09	Insert into Applicant values (1231651,'Jadyn Garcia','8425 Schoolhouse Drive,Houston, TX 770...	1 row(s) affected	0.000 sec
6	15:20:10	Insert into Applicant values (4561231,'Josh Rodriguez','80 N. Surrey Court Apt J,Owings Mills, M...	1 row(s) affected	0.016 sec
7	15:20:11	Insert into Applicant values (7894153,'Kevin Lin','9985 Gregory Avenue,Houston, TX 77057',28...	1 row(s) affected	0.000 sec
8	15:20:12	Insert into Applicant values (2313216,'Isabella Chen','260 Glenridge Dr.,West Bloomfield, MI 483...	1 row(s) affected	0.031 sec
9	15:20:13	Insert into Applicant values (9615132,'Andrew Sophia','15 Blackburn Avenue,Austin, TX 78744'...	1 row(s) affected	0.000 sec
10	15:20:14	Insert into Applicant values (4561321,'William Shakespeare','105 Creekside St.,Austin, TX 7874...	1 row(s) affected	0.015 sec

Result:

Code - Select * from Applicant;

State_ID_Num	Full_Name	Address	Contact_Numbe	State_Which_Issued_The_Si	Age	Schedule_Request_Confirmation_Number	Social_Security_Number	Ever_Been_Arrested
1000341	David Olivia	7912 Grant Court,San Antonio,TX 78201	2103469088	Texas	16	123156	684165313	No
9841651	Noah Amelia	8685 Magnolia St.,Ottawa, IL 61350	7799232348	Illinois	27	684651	641654985	No
6846151	Christopher Nolan	808 Overlook Dr.,Fort Worth,TX 76110	8179262551	Texas	54	651494	135516849	No
5615235	Nathan Drake	1 Nicolls Rd.,Houston, TX 77088	2817351223	Texas	24	354981	651684651	No
1231651	Jadyn Garcia	8425 Schoolhouse Drive,Houston, TX 77024	2819148822	Texas	33	164894	235468439	No
4561231	Josh Rodriguez	80 N. Surrey Court Apt J,Owings Mills, MD 21117	4109242900	Maryland	29	984651	788165138	No
7894153	Kevin Lin	9985 Gregory Avenue,Houston, TX 77057	2817638768	Texas	44	984151	984151310	No
2313216	Isabella Chen	260 Glenridge Dr.,West Bloomfield, MI 48322	2489232348	Michigan	78	684165	561513216	No
9615132	Andrew Sophia	15 Blackburn Avenue,Austin, TX 78744	5122942200	Texas	61	321351	654132013	No
4561321	William Shakespeare	105 Creekside St.,Austin, TX 78749	5126980422	Texas	26	334654	849415313	No

(ii) DPS Entity (table):

```

15 • Insert into DPS values (651494,'Forth Worth',6846151,'No','Charlie.P@dps.gov');
16 • Insert into DPS values (354981,'Houston',5615235,'No','Briar.M@dps.gov');
17 • Insert into DPS values (164894,'Houston',1231651,'No','Briar.M@dps.gov');
18 • Insert into DPS values (984151,'Houston',7894153,'No','Briar.M@dps.gov');
19 • Insert into DPS values (321351,'Austin',9615132,'No','Lee.P@dps.gov');
20 • Insert into DPS values (334654,'Austin',4561321,'No','Lee.P@dps.gov');

```

#	Time	Action	Message	Duration / Fetch
✓ 1	15:24:18	Insert into DPS values (651494,'Forth Worth',6846151,'No','Charlie.P@dps.gov')	1 row(s) affected	0.766 sec
✓ 2	15:24:21	Insert into DPS values (354981,'Houston',5615235,'No','Briar.M@dps.gov')	1 row(s) affected	0.093 sec
✓ 3	15:24:23	Insert into DPS values (164894,'Houston',1231651,'No','Briar.M@dps.gov')	1 row(s) affected	1.297 sec
✓ 4	15:24:25	Insert into DPS values (984151,'Houston',7894153,'No','Briar.M@dps.gov')	1 row(s) affected	0.000 sec
✓ 5	15:24:26	Insert into DPS values (321351,'Austin',9615132,'No','Lee.P@dps.gov')	1 row(s) affected	0.000 sec
✓ 6	15:24:28	Insert into DPS values (334654,'Austin',4561321,'No','Lee.P@dps.gov')	1 row(s) affected	0.000 sec

Result:

Code - Select * from DPS;

Schedule_ID	Service_Locations	State_ID_Number	applicant_previously_owner_gun_license	login_id
164894	Houston	1231651	No	Briar.M@dps.gov
321351	Austin	9615132	No	Lee.P@dps.gov
334654	Austin	4561321	No	Lee.P@dps.gov
354981	Houston	5615235	No	Briar.M@dps.gov
651494	Forth Worth	6846151	No	Charlie.P@dps.gov
984151	Houston	7894153	No	Briar.M@dps.gov

(iii) Portal for Authorities Entity (table):


```

24 • Insert into Portal_For_Authorities values ('Charlie.P@dps.gov','char!34',965132106981);
25 • Insert into Portal_For_Authorities values ('Junaid.h@service.org','jade$$98',965132106981);
26 • Insert into Portal_For_Authorities values ('Briar.M@dps.gov','mart*0*7',651681321577);
27 • Insert into Portal_For_Authorities values ('Deanna.B@service.org','den@56',651681321577);
28 • Insert into Portal_For_Authorities values ('Lee.P@dps.gov','park#90','384165168416');
29 • Insert into Portal_For_Authorities values ('Asif.M@service.org','May@09','384165168416');

```

Output

Action Output					
#	Time	Action	Message	Duration / Fetch	
✓ 1	15:26:17	Insert into Portal_For_Authorities values ('Charlie.P@dps.gov','char!34',965132106981)	1 row(s) affected	0.000 sec	
✓ 2	15:26:18	Insert into Portal_For_Authorities values ('Junaid.h@service.org','jade\$\$98',965132106981)	1 row(s) affected	0.125 sec	
✓ 3	15:26:19	Insert into Portal_For_Authorities values ('Briar.M@dps.gov','mart*0*7',651681321577)	1 row(s) affected	0.000 sec	
✓ 4	15:26:20	Insert into Portal_For_Authorities values ('Deanna.B@service.org','den@56',651681321577)	1 row(s) affected	0.016 sec	
✓ 5	15:26:20	Insert into Portal_For_Authorities values ('Lee.P@dps.gov','park#90','384165168416')	1 row(s) affected	0.015 sec	
✓ 6	15:26:21	Insert into Portal_For_Authorities values ('Asif.M@service.org','May@09','384165168416')	1 row(s) affected	0.000 sec	

Result:

Code - Select * from Portal_For_Authorities;

Result Grid			
Filter Rows: <input type="text"/>			
Edit:			
Export/Import:			
Wrap Cell Content:			
Login_ID	login_password	Server_ID	
Asif.M@service.org	May@09	384165168416	
Briar.M@dps.gov	mart*0*7	651681321577	
Charlie.P@dps.gov	char!34	965132106981	
Deanna.B@service.org	den@56	651681321577	
Junaid.h@service.org	jade\$\$98	965132106981	
Lee.P@dps.gov	park#90	384165168416	

4. Queries

(i) Inner Join:

```

5 -- Inner join
6 • Select app.State_ID_Number,app.full_name,app.Contact_Number_Mentioned_On_The_State_ID,app.Age,app.Social_Security_Number,app.Address,
7   p.Service_Locations from applicant AS app
8   inner join dps d
9   on app.State_ID_Number=d.State_ID_Number;

```

Result Grid							
Filter Rows: <input type="text"/>							
Export:							
Wrap Cell Content:							
State_ID_Number	full_name	Contact_Number_Mentioned_On_The_State_ID	Age	Social_Security_Number	Address	Service_Locations	
1231651	Jadyn Garcia	2819148822	33	235468439	8425 Schoolhouse Drive,Houston, TX 77024	Houston	
4561321	William Shakespeare	5126980422	26	849415313	105 Creekside St.,Austin, TX 78749	Austin	
5615235	Nathan Drake	2817351223	24	651684651	1 Nicolls Rd.,Houston, TX 77088	Houston	
6846151	Christopher Nolan	8179262551	54	135516849	808 Overlook Dr.,Fort Worth,TX 76110	Forth Worth	
7894153	Kevin Lin	2817638768	44	984151310	9985 Gregory Avenue,Houston, TX 77057	Houston	
9615132	Andrew Sophia	5122942200	61	654132013	15 Blackburn Avenue,Austin, TX 78744	Austin	

Provides some of the details of the applicants and which service location they have been allocated to based on their address. It fetches the values that are matching in both the 'applicant' and 'dps' tables.

(ii) Left Outer Join:

The below result from the left outer query fetched all the values from the table 'applicant' and matching records from the table 'dps'. This result shows that the service location and schedule

id have not been assigned (null) for some of the records as either the applicant does not meet the requirement of being at least 18 years old or are not from does not have the state id of Texas. The details of the applicant who do not meet these criteria have not been stored in the table 'DPS' as it is only relevant to store the data of eligible applicants. Another thing that can be observed from the result is that one applicant can only be related to one service location. However, one service location can have multiple applicants.

```

11  -- left outer Join
12  • Select app.State_ID_Number,app.full_name,app.Age,app.State_Which_Issued_The_State_ID,app.Social_Security_Number,app.address,d.Service_Locations,
13  |.schedule_id from applicant AS app
14  left join dps d
15  on app.State_ID_Number=d.State_ID_Number;

```

State_ID_Number	full_name	Age	State_Which_Issued_The_State_ID	Social_Security_Number	address	Service_Locations	schedule_id
1000341	David Olivia	16	Texas	684165313	7912 Grant Court,San Antonio,TX 78201	NULL	NULL
1231651	Jadyn Garcia	33	Texas	235468439	8425 Schoolhouse Drive,Houston, TX 77024	Houston	164894
2313216	Isabella Chen	78	Michigan	561513216	260 Glenridge Dr.,West Bloomfield, MI 48322	NULL	NULL
4561231	Josh Rodriguez	29	Maryland	788165138	80 N. Surrey Court Apt J,Owings Mills, MD 21117	NULL	NULL
4561321	William Shakespeare	26	Texas	849415313	105 Creekside St.,Austin, TX 78749	Austin	334654
5615235	Nathan Drake	24	Texas	651684651	1 Nicolls Rd.,Houston, TX 77088	Houston	354981
6846151	Christopher Nolan	54	Texas	135516849	808 Overlook Dr.,Fort Worth,TX 76110	Forth Worth	651494
7894153	Kevin Lin	44	Texas	984151310	9985 Gregory Avenue,Houston, TX 77057	Houston	984151
9615132	Andrew Sophia	61	Texas	654132013	15 Blackburn Avenue,Austin, TX 78744	Austin	321351
9841651	Noah Amelia	27	Illinois	641654985	8685 Magnolia St.,Ottawa, IL 61350	NULL	NULL

(iii) Union:

```

22  -- union
23  • select d.login_id from dps d
24  union
25  select p.login_id from portal_for_authorities p;
26

```

login_id
Briar.M@dps.gov
Lee.P@dps.gov
Charlie.P@dps.gov
Asif.M@service.org
Deanna.B@service.org
Junaid.h@service.org

It considers the row that is mentioned in the select part of the statement which is 'login_id'. The script in this is combining the login id that is contained in the table 'dps' with the login id that is contained in the table 'portal_for_authorities'. It is also eliminating the duplicate records that would have been resulted from the combination of both the tables.

(iv) Except:

27	-- except
28	• select app.state_id_number,app.full_name from applicant app
29	where app.state_id_number not in (select d.State_ID_Number from dps d where d.State_ID_Number in ('4561321','1231651'));
30	
31	

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
state_id_number	full_name		
1000341	David Olivia		
2313216	Isabella Chen		
4561231	Josh Rodriguez		
5615235	Nathan Drake		
6846151	Christopher Nolan		
7894153	Kevin Lin		
9615132	Andrew Sophia		
9841651	Noah Amelia		

As MySQL does not support the operator 'Except', an alternative way had to be adopted to get the same result. The script returned the values for state id and full name columns for those records from the 'applicant' table that are not present in the results returned by the other SELECT which fetches the result for the state ID numbers 4561321 and 1231651 from the list. So, in the main result, these two state id numbers have been excluded.

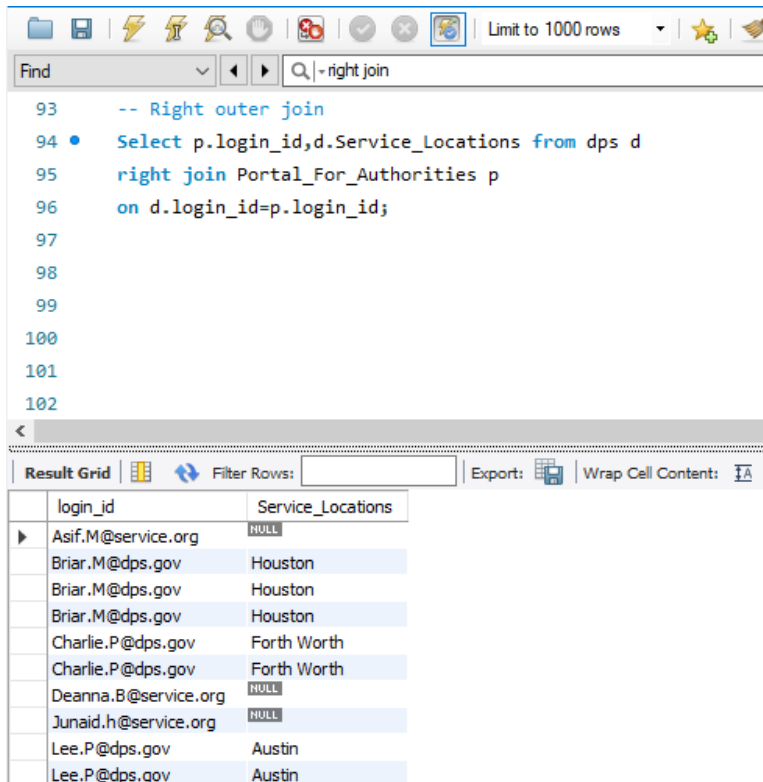
(v) Intersect:

88	-- Intersect
89	• select distinct p.login_id from dps as d
90	inner join portal_for_authorities as p
91	on d.login_id=p.login_id;
92	
93	
94	
95	
96	
97	

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
login_id			
Briar.M@dps.gov			
Charlie.P@dps.gov			
Lee.P@dps.gov			

As MySQL does not support operator 'Intersect', an alternative way had to be used to get the same results that the intersect would have fetched. The script returns the login ids that are both common to the tables 'dps' and 'portal_for_authorities' and removes the duplicate records by using 'distinct' function.

(vi) Right Outer Join:



The screenshot shows a MySQL IDE window with a SQL query editor and a result grid. The query is a right outer join between the 'Portal_For_Authorities' table (p) and the 'dps' table (d) on the 'login_id' column. The result grid displays the output of the query, showing all rows from 'Portal_For_Authorities' and matching rows from 'dps'. The columns are 'login_id' and 'Service_Locations'.

```
93  -- Right outer join
94  •  Select p.login_id,d.Service_Locations from dps d
95  right join Portal_For_Authorities p
96  on d.login_id=p.login_id;
97
98
99
100
101
102
```

login_id	Service_Locations
Asif.M@service.org	NULL
Briar.M@dps.gov	Houston
Briar.M@dps.gov	Houston
Briar.M@dps.gov	Houston
Charlie.P@dps.gov	Forth Worth
Charlie.P@dps.gov	Forth Worth
Deanna.B@service.org	NULL
Junaid.h@service.org	NULL
Lee.P@dps.gov	Austin
Lee.P@dps.gov	Austin

In this, all the rows from the table 'portal_for_authorities' are fetched and matching rows from the table 'dps' are fetched. The logic behind doing this is that the login_id columns show all the login_id that are present in the database regardless of whether those people belong from dps or service locations. The column service_locations from the table 'dps' provides additional information about dps officers and which region they handle and have access to.

(vii) full outer join:

As MySQL does not use the operator 'full outer join', an alternative way had to be found to get the similar result to full outer join. This returns all the rows of the tables 'dps' and 'applicant' even the rows which don't match.

	State_ID_Number	full_name	Age	State_Which_Issued_The_State_ID	Social_Security_Number	address	Service_Locations	schedule_id
▶	1000341	David Olivia	16	Texas	684165313	7912 Grant Court,San Antonio,TX 78201	NULL	NULL
	1231651	Jadyn Garcia	33	Texas	235468439	8425 Schoolhouse Drive,Houston, TX 77024	Houston	164894
	2313216	Isabella Chen	78	Midhigan	561513216	260 Glenridge Dr.,West Bloomfield, MI 48322	NULL	NULL
	4561231	Josh Rodriguez	29	Maryland	788165138	80 N. Surrey Court Apt J,Owings Mills, MD 21117	NULL	NULL
	4561321	William Shakespeare	26	Texas	849415313	105 Creekside St.,Austin, TX 78749	Austin	334654
	5615235	Nathan Drake	24	Texas	651684651	1 Nicolls Rd.,Houston, TX 77088	Houston	354981
	6846151	Christopher Nolan	54	Texas	135516849	808 Overlook Dr.,Fort Worth,TX 76110	Forth Worth	651494
	6846151	Christopher Nolan	54	Texas	135516849	808 Overlook Dr.,Fort Worth,TX 76110	Forth Worth	651495
	7894153	Kevin Lin	44	Texas	984151310	9985 Gregory Avenue,Houston, TX 77057	Houston	984151
	9615132	Andrew Sophia	61	Texas	654132013	15 Blackburn Avenue,Austin, TX 78744	Austin	321351
	9841651	Noah Amelia	27	Illinois	641654985	8685 Magnolia St.,Ottawa, IL 61350	NULL	NULL

