IPA Part 3 – SQL

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BUAN 6320.005

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1. Create Database

```
Create database GardenServicesMV;
use GardenServicesMV;
```

2. Create Tables with PKs and FKs ; • Define which entities will be your PK and FKs and make them "Unique" during to DDL statement. • If you have any "Constrains" go ahead create in this stage.

```
CREATE TABLE Vendor(
    vendorID CHAR(6) NOT NULL,
    vendorName VARCHAR(255),
    vendorAddress VARCHAR(255),
    vendorPhoneNumber CHAR(12)
);
alter table Vendor
ADD constraint PKvendorID PRIMARY KEY(vendorID);

CREATE TABLE Tool(
    toolID CHAR(6) NOT NULL,
    toolName VARCHAR(255),
    vendorID CHAR(6)
);
alter table Tool
ADD constraint PKtoolID PRIMARY KEY(toolID);
alter table Tool
ADD constraint FKvendorID FOREIGN KEY(vendorID) references
Vendor(vendorID);

CREATE TABLE GroundWorker(
    employeeID CHAR(6) NOT NULL,
    empFirstName VARCHAR(255),
    empLastName VARCHAR(255),
    dateOfBirth DATE,
    socialSecurityNumber INT
);
alter table GroundWorker
ADD constraint PKemployeeID PRIMARY KEY(employeeID);

CREATE TABLE ToolLog(
    logID CHAR(6) NOT NULL,
    toolID CHAR(6),
    employeeID CHAR(6),
    logDate DATE
);
alter table ToolLog
ADD constraint PKlogID PRIMARY KEY(logID);
```

```sql
alter table ToolLog
ADD constraint FKtoolID FOREIGN KEY(toolID) references
Tool(toolID);
alter table ToolLog
ADD constraint FKemployeeID FOREIGN KEY(employeeID) references
GroundWorker(employeeID);

CREATE TABLE ServicesOffered(
    serviceID CHAR(6) NOT NULL,
    serviceName VARCHAR(255),
    serviceDescription VARCHAR(255),
    insuranceType VARCHAR(255)
);
alter table ServicesOffered
ADD constraint PKserviceID PRIMARY KEY(serviceID);

CREATE TABLE Customer(
    customerID CHAR(6) NOT NULL,
    customerFirstName VARCHAR(255),
    customerLastName VARCHAR(255),
    customerAddress VARCHAR(255),
    customerPhoneNumber CHAR(12)
);
alter table Customer
ADD constraint PKcustomerID PRIMARY KEY(customerID);

CREATE TABLE ServiceRecord(
    recordID CHAR(6) NOT NULL,
    employeeID CHAR(6),
    serviceDate DATE,
    serviceID CHAR(6),
    customerID CHAR(6)
);
alter table ServiceRecord
Add constraint PKrecordID PRIMARY KEY(recordID);
alter table ServiceRecord
ADD constraint FKemployeeID1 FOREIGN KEY(employeeID) REFERENCES
GroundWorker(employeeID);
alter table ServiceRecord
ADD constraint FKserviceID FOREIGN KEY(serviceID) REFERENCES
ServicesOffered(serviceID);
alter table ServiceRecord
ADD constraint FKcustomerID FOREIGN KEY(customerID) REFERENCES
Customer(customerID);
```

3. Test all your tables before the load any data (make sure all columns are in place)

The tables have been created successfully.

4. Start inserting data into each table (do not import the file use SQL commands)

```sql
INSERT INTO  Vendor VALUES ('V10005','Als Decoration Makers', '1455 Pleasant
Road', '545-993-6564');
INSERT INTO  Vendor VALUES ('V12007','Ally Tools', '9696 Richland Street', '545-
360-4123');
INSERT INTO  Vendor VALUES ('V11014','Growers Plants', '3267 Sunflower Road',
'589-630-0015');
INSERT INTO  Vendor VALUES ('V10011','Knick Knack Paddywhacks', '6905 White
Street', '971-555-7806');
INSERT INTO  Vendor VALUES ('V11008','Sharpe Growery', '4408 Beltline Road',
'589-880-0029');
INSERT INTO  Vendor VALUES ('V12012','Tool Warehouse', '1100 Eisenhower Highway',
'971-371-5901');
INSERT INTO  Vendor VALUES ('V10023','Dunnigans', '3570 Falk Street', '975-636-
9588');
INSERT INTO  Vendor VALUES ('V11002','Green Trees', '6461 Ridge View Road', '589-
105-6078');
INSERT INTO  Vendor VALUES ('V11023','Lester & Smith Flowers', '6200 South Rome
Street', '951-878-8411');
INSERT INTO  Vendor VALUES ('V12067','Lumberjack Tools', '8234 Carter Street',
'575-564-9137');

INSERT INTO  Tool VALUES ('T12003','Iron Spade', 'V12007');
INSERT INTO  Tool VALUES ('T14027','GTX43 Lawn Mower', 'V12012');
INSERT INTO  Tool VALUES ('T17006','Premium Wheelbarrow', 'V12067');
INSERT INTO  Tool VALUES ('T13024','Wheelbarrow', NULL);
INSERT INTO  Tool VALUES ('T12008','Chainsaw', 'V12007');
INSERT INTO  Tool VALUES ('T14016','LL Lawnmower', 'V12012');

INSERT INTO  GroundWorker VALUES ('E10056','Matthew', 'Brown', '1986-01-09',
'381916366');
INSERT INTO  GroundWorker VALUES ('E10070','Michael', 'Custer', '1981-11-09',
'761084302');
INSERT INTO  GroundWorker VALUES ('E10085','Isaiah ', 'Smith', '1998-07-08',
'584946275');
INSERT INTO  GroundWorker VALUES ('E10089','Heath', 'Ortega', '2000-11-24',
'379165654');
INSERT INTO  GroundWorker VALUES ('E10094','Christopher', 'Short', '1976-07-20',
'652014789');
```

```sql
INSERT INTO  ToolLog VALUES ('L10356','T14027', 'E10056', '2021-07-11');
INSERT INTO  ToolLog VALUES ('L10378','T12003', 'E10056', '2021-07-20');
INSERT INTO  ToolLog VALUES ('L10384','T14027', NULL, '2021-07-24');
INSERT INTO  ToolLog VALUES ('L10388','T17006', 'E10070', '2021-07-25');
INSERT INTO  ToolLog VALUES ('L10394','T12003', 'E10070', '2021-08-02');
INSERT INTO  ToolLog VALUES ('L10405','T14027', 'E10070', '2021-08-08');
INSERT INTO  ToolLog VALUES ('L10415','T17006', 'E10070', '2021-08-10');
INSERT INTO  ToolLog VALUES ('L10428','T14027', NULL, '2021-08-12');
INSERT INTO  ToolLog VALUES ('L10434','T12003', 'E10085', '2021-08-16');
INSERT INTO  ToolLog VALUES ('L10441','T17006', 'E10085', '2021-08-24');

INSERT INTO  ServicesOffered VALUES ('S16123','Corporate Lawn Mowing', 'Lawn
Mowing and Edging for businesses', 'Commercial Insurance');
INSERT INTO  ServicesOffered VALUES ('S26123','Private Lawn Mowing', 'Lawn Mowing
and Edging for private households', 'Residential Insurance');
INSERT INTO  ServicesOffered VALUES ('S16125','Corporate Decorating', 'Putting up
decoration for businesses', 'Commercial Insurance');
INSERT INTO  ServicesOffered VALUES ('S26125','Private Decorating', 'Putting up
decoration for private households', 'Residential Insurance');

INSERT INTO  Customer VALUES ('C13123','Bill', 'Watson', '7899 Waterview Street',
'686-415-9154');
INSERT INTO  Customer VALUES ('C13158','Alexander', 'Roberts', '9390 Gold
Avenue', '545-000-7001');
INSERT INTO  Customer VALUES ('C13178','Ralph', 'Samson', '4946 Winston Street
Suite 283', '686-480-3135');
INSERT INTO  Customer VALUES ('C13188','Matilda', 'Baxter', '7359 Mapleshade
Drive', '910-470-1181');
INSERT INTO  Customer VALUES ('C13191','Beth', 'Peterson', '6903 Bluestone Road',
'951-933-6621');
INSERT INTO  Customer VALUES ('C13198','Ayush', 'Singh', '1880 Thomas Drive',
'712-524-4218');
INSERT INTO  Customer VALUES ('C13208','Jorge', 'Espinoza', '6810 East 16th
Street', '951-993-7860');
INSERT INTO  Customer VALUES ('C13217','Albert', 'Waterhouse', '8108 Sterling
Street', '686-097-8381');

INSERT INTO  ServiceRecord VALUES ('R15444','E10056', '2021-07-10', 'S16123',
'C13123');
INSERT INTO  ServiceRecord VALUES ('R15449', NULL, '2021-07-14', 'S16123',
'C13188');
INSERT INTO  ServiceRecord VALUES ('R15458','E10070', '2021-07-17', 'S16125',
NULL);
INSERT INTO  ServiceRecord VALUES ('R15689','E10070', '2021-08-27', 'S16123',
'C13123');
```

```
INSERT INTO  ServiceRecord VALUES ('R15714',NULL, '2021-09-01', 'S16125',
'C13123');
INSERT INTO  ServiceRecord VALUES ('R15728','E10085', '2021-09-04', 'S26125',
'C13191');
INSERT INTO  ServiceRecord VALUES ('R15739','E10089', '2021-09-08', 'S26123',
'C13191');
INSERT INTO  ServiceRecord VALUES ('R15779','E10094', '2021-09-12', 'S26123',
NULL);
INSERT INTO  ServiceRecord VALUES ('R15791','E10094', '2021-09-17', 'S26123',
'C13208');
INSERT INTO  ServiceRecord VALUES ('R15840','E10094', '2021-09-25', 'S26123',
'C13217');
```

5. Test your data, are they in the place correctly?

Yes, all data is correctly in the tables.

6. Chose at least two (2) tables from your project that has relationship and ;

a. Show your table records.

	vendorID	vendorName	vendorAddress	vendorPhoneNumber
	Filter	Filter	Filter	Filter
1	V10005	Als Decoration Makers	1455 Pleasant Road	545-993-6564
2	V10011	Knick Knack Paddywhack	6905 White Street	971-555-7806
3	V10023	Dunnigans	3570 Falk Street	975-636-9588
4	V11002	Green Trees	6461 Ridge View Road	589-105-6078
5	V11008	Sharpe Growery	4408 Beltline Road	589-880-0029
6	V11014	Growers Plants	3267 Sunflower Road	589-630-0015
7	V11023	Lester & Smith Flowers	6200 South Rome Street	951-878-8411
8	V12007	Ally Tools	9696 Richland Street	545-360-4123
9	V12012	Tool Warehouse	1100 Eisenhower Highwa	971-371-5901
10	V12067	Lumberjack Tools	8234 Carter Street	575-564-9137

		toolID	toolName	vendorID
		Filter	Filter	Filter
	1	T12003	Iron Spade	V12007
	2	T12008	Chainsaw	V12007
	3	T13024	Wheelbarrow	(NULL)
	4	T14016	LL Lawnmower	V12012
	5	T14027	GTX43 Lawn Mower	V12012
	6	T17006	Premium Wheelbarrow	V12067

		employeeID	empFirstName	empLastName	dateOfBirth	socialSecurityNumber
		Filter	Filter	Filter	Filter	Filter
	1	E10056	Matthew	Brown	1986-01-09	381916366
	2	E10070	Michael	Custer	1981-11-09	761084302
	3	E10085	Isaiah	Smith	1998-07-08	584946275
	4	E10089	Heath	Ortega	2000-11-24	379165654
	5	E10094	Christopher	Short	1976-07-20	652014789

		logID	toolID	employeeID	logDate
		Filter	Filter	Filter	Filter
	1	L10356	T14027	E10056	2021-07-11
	2	L10378	T12003	E10056	2021-07-20
	3	L10384	T14027	(NULL)	2021-07-24
	4	L10388	T17006	E10070	2021-07-25
	5	L10394	T12003	E10070	2021-08-02
	6	L10405	T14027	E10070	2021-08-08
	7	L10415	T17006	E10070	2021-08-10
	8	L10428	T14027	(NULL)	2021-08-12
	9	L10434	T12003	E10085	2021-08-16
	10	L10441	T17006	E10085	2021-08-24

		Filter	Filter	Filter	Filter
	1	S16123	Corporate Lawn Mowing	Lawn Mowing and Edgin	Commercial Insurance
	2	S16125	Corporate Decorating	Putting up decoration fo	Commercial Insurance
	3	S26123	Private Lawn Mowing	Lawn Mowing and Edgin	Residential Insurance
	4	S26125	Private Decorating	Putting up decoration fo	Residential Insurance

		customerID	customerFirstName	customerLastName	customerAddress	customerPhoneNumber
		Filter	Filter	Filter	Filter	Filter
	1	C13123	Bill	Watson	7899 Waterview Street	686-415-9154
	2	C13158	Alexander	Roberts	9390 Gold Avenue	545-000-7001
	3	C13178	Ralph	Samson	4946 Winston Street Sui	686-480-3135
	4	C13188	Matilda	Baxter	7359 Mapleshade Drive	910-470-1181
	5	C13191	Beth	Peterson	6903 Bluestone Road	951-933-6621
	6	C13198	Ayush	Singh	1880 Thomas Drive	712-524-4218
	7	C13208	Jorge	Espinoza	6810 East 16th Street	951-993-7860
	8	C13217	Albert	Waterhouse	8108 Sterling Street	686-097-8381

		recordID	employeeID	serviceDate	serviceID	customerID
		Filter	Filter	Filter	Filter	Filter
	1	R15444	E10056	2021-07-10	S16123	C13123
	2	R15449	(NULL)	2021-07-14	S16123	C13188
	3	R15458	E10070	2021-07-17	S16125	(NULL)
	4	R15689	E10070	2021-08-27	S16123	C13123
	5	R15714	(NULL)	2021-09-01	S16125	C13123
	6	R15728	E10085	2021-09-04	S26125	C13191
	7	R15739	E10089	2021-09-08	S26123	C13191
	8	R15779	E10094	2021-09-12	S26123	(NULL)
	9	R15791	E10094	2021-09-17	S26123	C13208
	10	R15840	E10094	2021-09-25	S26123	C13217

b. Create inner joins between two tables and explain what is the purpose of your join ?

Show all employees who have used Tool T14027.

```
SELECT DISTINCT GW.employeeID, GW.empFirstName, GW.empLastName, TL.toolID
FROM GroundWorker GW
INNER JOIN ToolLog TL
ON GW.employeeID = TL.employeeID
WHERE TL.toolID = "T14027";
```

	employeeID	empFirstName	empLastName	toolID
	Filter	Filter	Filter	Filter
1	E10056	Matthew	Brown	T14027
2	E10070	Michael	Custer	T14027

c. Create full joins between two tables and explain what is the purpose of your join ?

Show all customers and all service records, and which customers correspond to which service records. (There is no full join command in SQL, so this is an alternative)
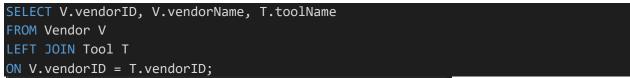
```
SELECT *
FROM ServiceRecord SR
LEFT JOIN Customer C
ON SR.customerID = C.customerID
UNION ALL
SELECT *
FROM ServiceRecord SR
RIGHT JOIN Customer C
ON SR.customerID = C.customerID
WHERE SR.customerID is NULL;
```

		recordID	employeeID	serviceDate	serviceID	customerID	customerID
		Filter	Filter	Filter	Filter	Filter	Filter
1		R15444	E10056	2021-07-10	S16123	C13123	C13123
2		R15449	(NULL)	2021-07-14	S16123	C13188	C13188
3		R15458	E10070	2021-07-17	S16125	(NULL)	(NULL)
4		R15689	E10070	2021-08-27	S16123	C13123	C13123
5		R15714	(NULL)	2021-09-01	S16125	C13123	C13123
6		R15728	E10085	2021-09-04	S26125	C13191	C13191
7		R15739	E10089	2021-09-08	S26123	C13191	C13191
8		R15779	E10094	2021-09-12	S26123	(NULL)	(NULL)
9		R15791	E10094	2021-09-17	S26123	C13208	C13208
10		R15840	E10094	2021-09-25	S26123	C13217	C13217
11		(NULL)	(NULL)	(NULL)	(NULL)	C13158	C13158
12		(NULL)	(NULL)	(NULL)	(NULL)	C13178	C13178
13		(NULL)	(NULL)	(NULL)	(NULL)	C13198	C13198

customerFirstName	customerLastName	customerAddress	customerPhoneNumber
Filter	Filter	Filter	Filter
Bill	Watson	7899 Waterview Street	686-415-9154
Matilda	Baxter	7359 Mapleshade Drive	910-470-1181
(NULL)	(NULL)	(NULL)	(NULL)
Bill	Watson	7899 Waterview Street	686-415-9154
Bill	Watson	7899 Waterview Street	686-415-9154
Beth	Peterson	6903 Bluestone Road	951-933-6621
Beth	Peterson	6903 Bluestone Road	951-933-6621
(NULL)	(NULL)	(NULL)	(NULL)
Jorge	Espinoza	6810 East 16th Street	951-993-7860
Albert	Waterhouse	8108 Sterling Street	686-097-8381
Alexander	Roberts	9390 Gold Avenue	545-000-7001
Ralph	Samson	4946 Winston Street Sui	686-480-3135
Ayush	Singh	1880 Thomas Drive	712-524-4218

d. Create left outer joins between two tables and explain what is the purpose of your join ?
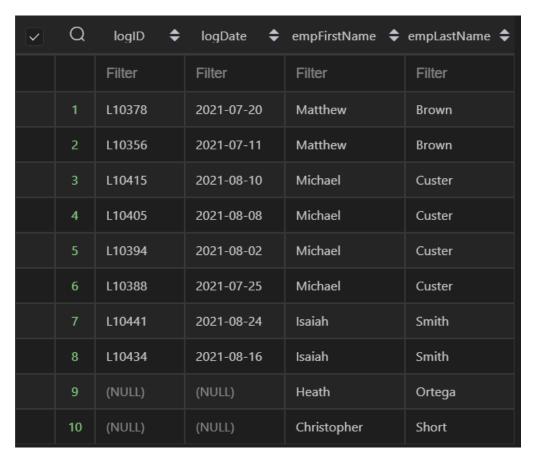
Show all vendors and which tools they provide, if any.

```sql
SELECT V.vendorID, V.vendorName, T.toolName
FROM Vendor V
LEFT JOIN Tool T
ON V.vendorID = T.vendorID;
```

	vendorID	vendorName	toolName
	Filter	Filter	Filter
1	V10005	Als Decoration Makers	(NULL)
2	V10011	Knick Knack Paddywhac	(NULL)
3	V10023	Dunnigans	(NULL)
4	V11002	Green Trees	(NULL)
5	V11008	Sharpe Growery	(NULL)
6	V11014	Growers Plants	(NULL)
7	V11023	Lester & Smith Flowers	(NULL)
8	V12007	Ally Tools	Iron Spade
9	V12007	Ally Tools	Chainsaw
10	V12012	Tool Warehouse	LL Lawnmower
11	V12012	Tool Warehouse	GTX43 Lawn Mowe
12	V12067	Lumberjack Tools	Premium Wheelbar

e. Create right outer joins between two tables and explain what is the purpose of your join ?
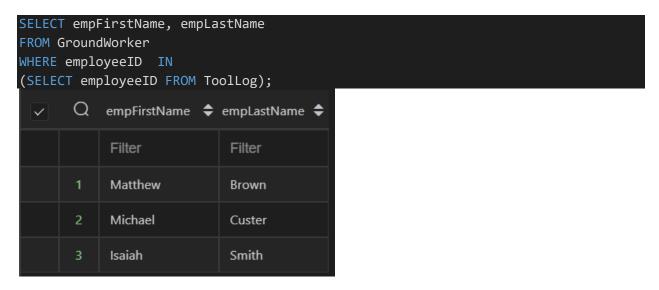
Show tool log and all ground workers whether or not they have used tools.

```sql
SELECT T.logID, T.logDate, G.empFirstName, G.empLastName
FROM ToolLog T
RIGHT JOIN GroundWorker G
ON T.employeeID = G.employeeID;
```

	Q	logID ⇕	logDate ⇕	empFirstName ⇕	empLastName ⇕
✓		Filter	Filter	Filter	Filter
	1	L10378	2021-07-20	Matthew	Brown
	2	L10356	2021-07-11	Matthew	Brown
	3	L10415	2021-08-10	Michael	Custer
	4	L10405	2021-08-08	Michael	Custer
	5	L10394	2021-08-02	Michael	Custer
	6	L10388	2021-07-25	Michael	Custer
	7	L10441	2021-08-24	Isaiah	Smith
	8	L10434	2021-08-16	Isaiah	Smith
	9	(NULL)	(NULL)	Heath	Ortega
	10	(NULL)	(NULL)	Christopher	Short

f. Create intersect between two tables and explain what is the purpose of your intersect ?

Show the names of all employees who have used a tool. (There is no intersect command in SQL, so this is an alternative)

```
SELECT empFirstName, empLastName
FROM GroundWorker
WHERE employeeID  IN
(SELECT employeeID FROM ToolLog);
```

	Q	empFirstName ⇕	empLastName ⇕
✓		Filter	Filter
	1	Matthew	Brown
	2	Michael	Custer
	3	Isaiah	Smith

g. Create union between two tables and explain what is the purpose of your union?

Show all vendor addresses and customer addresses to get an idea of where to build a new office.

```sql
SELECT vendorAddress FROM Vendor
UNION
SELECT customerAddress FROM Customer;
```

	Filter
1	1455 Pleasant Road
2	6905 White Street
3	3570 Falk Street
4	6461 Ridge View Road
5	4408 Beltline Road
6	3267 Sunflower Road
7	6200 South Rome Street
8	9696 Richland Street
9	1100 Eisenhower Highw
10	8234 Carter Street
11	7899 Waterview Street
12	9390 Gold Avenue

…continued

13	4946 Winston Street Sui
14	7359 Mapleshade Drive
15	6903 Bluestone Road
16	1880 Thomas Drive
17	6810 East 16th Street
18	8108 Sterling Street

h. Create except between two tables and explain what is the purpose of your except?

Show the customer ID and customer name of the customers who have not had any services. (There is no except command in SQL, so this is an alternative)

```sql
SELECT c.customerID, c.customerFirstName, c.customerLastName
FROM Customer c
WHERE not EXISTS
(SELECT c.customerID
from ServiceRecord s
WHERE s.customerID = c.customerID);
```

	customerID	customerFirstName	customerLastName
	Filter	Filter	Filter
1	C13158	Alexander	Roberts
2	C13178	Ralph	Samson
3	C13198	Ayush	Singh