Alpaca Oasis Organization

Database Design Proposal

Katie Bartolotta

Table of Contents

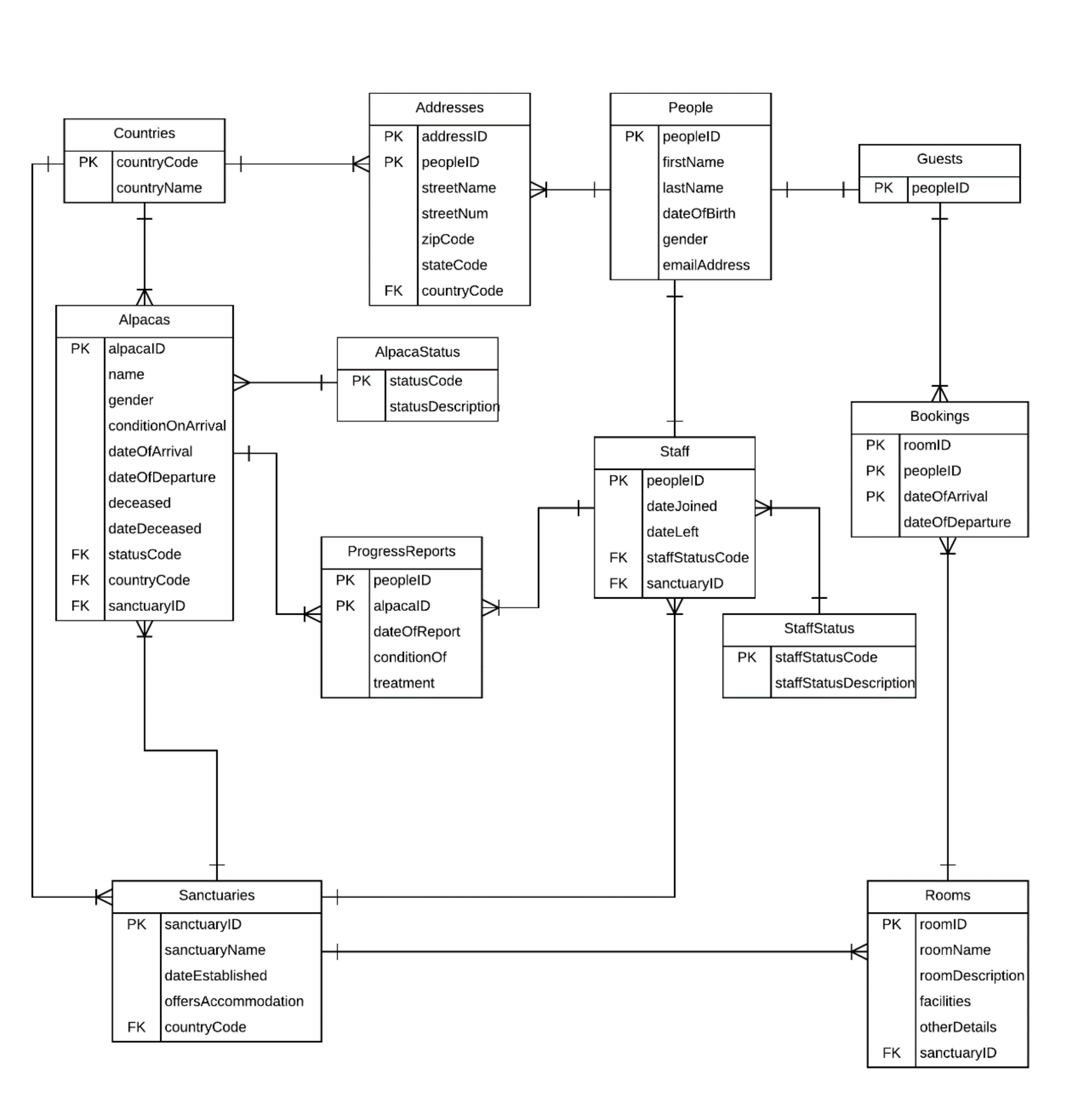
Executive Summary

The Alpaca Oasis Organization oversees alpaca sanctuaries all over the world. They require a database to catalogue their sanctuaries, alpacas, staff, and guests. This data must be accurate to ensure the future life of the agency.

This is intended to be used by the Alpaca Oasis Organization to begin documentation so that the records of their assets can be kept through their organizations. It will allow the agency to stay on course by having a picture and working database of what they need to keep track of on a daily basis.

Events that need to be kept track of for federal purposes such as the death of an alpaca, the purchase of a guest room or the hiring and firing of an employee will be traced to ensure no fees can be held or lawsuits filed against the organization.

ER Diagram



Countries	
PK	countryCode
	countryName

Addresses	
PK	addressID
PK	peopleID
	streetName
	streetNum
	zipCode
	stateCode
FK	countryCode

People	
PK	peopleID
	firstName
	lastName
	dateOfBirth
	gender
	emailAddress

Guests	
PK	peopleID

Alpacas	
PK	alpacaID
	name
	gender
	conditionOnArrival
	dateOfArrival
	dateOfDeparture
	deceased
	dateDeceased
FK	statusCode
FK	countryCode
FK	sanctuaryID

AlpacaStatus	
PK	statusCode
	statusDescription

Staff	
PK	peopleID
	dateJoined
	dateLeft
FK	staffStatusCode
FK	sanctuaryID

Bookings	
PK	roomID
PK	peopleID
PK	dateOfArrival
	dateOfDeparture

ProgressReports	
PK	peopleID
PK	alpacaID
	dateOfReport
	conditionOf
	treatment

StaffStatus	
PK	staffStatusCode
	staffStatusDescription

Sanctuaries	
PK	sanctuaryID
	sanctuaryName
	dateEstablished
	offersAccommodation
FK	countryCode

Rooms	
PK	roomID
	roomName
	roomDescription
	facilities
	otherDetails
FK	sanctuaryID

Tables

Countries

Lists all countries that sanctuaries operate in and alpacas are from.

```
CREATE TABLE IF NOT EXISTS Countries(
countryCode TEXT,
countryName TEXT,
PRIMARY KEY(countryCode)
);
```

Functional Dependencies:

countryCode → countryName

countryCode Text	countryName Text
ALB	Albania
AUS	Australia
CHL	Chile
CHN	China
USA	United States of America
HTI	Haiti
PAK	Pakistan

Sanctuaries

Lists all sanctuaries associated with the Alpaca Oasis Organization.

```
CREATE TABLE IF NOT EXISTS Sanctuaries(
sanctuaryID SERIAL,
santcuaryName TEXT,
dateEstablished DATE,
offersAccommodation BOOLEAN,
countryCode TEXT,
PRIMARY KEY(sanctuaryID),
FOREIGN KEY(countryCode) references Countries(countryCode)
);
```

Functional Dependencies:

sanctuaryID → sanctuaryName, dateEstablished, offersAccommodation, countryCode

sanctuaryID Serial	sanctuaryName Text	dateEstablished Date	offersAccommodation Boolean	countryCode Text
1	Furry Friends	2000-12-05	True	PAK
2	Alpaca Haven	2002-03-10	True	USA
3	Wooly Farms	2002-05-21	True	HTI
4	Packs of Alpacas	2005-07-08	True	AUS
5	Alpaca Zoo	2007-06-28	True	ALB
6	All the Alpacas	2010-08-06	True	CHL
7	Sunny Alpaca Farm	2015-04-14	False	CHN

Rooms

Lists all rooms available for guests to stay in.

```
CREATE TABLE IF NOT EXISTS Rooms(
roomID SERIAL,
roomName TEXT,
roomDescription TEXT,
facilities TEXT,
otherDetails TEXT,
sanctuaryID INT,
PRIMARY KEY(roomID),
FOREIGN KEY(sanctuaryID) references Sanctuaries(sanctuaryID)
);
```

Functional Dependencies:

roomID → roomName, roomDescription, facilities, otherDetails, sanctuaryID

roomID	roomName	roomDescription	facilities	otherDetails	sanctuaryID
Serial	Text	Text	Text	Text	Integer
1	Oasis	Single	Full Bath	Handicap	2
2	Breezeway	Double	Full Bath	No Windows	2
3	Tuscan Sun	Double	Full Bath	Pool View	2
4	Sunflower	Quad	Full Bath	Handicap	2
5	Daisy	Single	Half Bath	Pool View	2
6	Rose	Single	Half Bath	Hill View	2
7	Hearth	Triple	Full Bath	Handicap	2

Bookings

Lists all rooms booked by tourists.

```
CREATE TABLE IF NOT EXISTS Bookings(
roomID INT,
peopleID INT,
dateOfArrival DATE,
dateOfDeparture DATE,
PRIMARY KEY(roomID, peopleID, dateOfArrival),
FOREIGN KEY(peopleID) references People(peopleID),
FOREIGN KEY(roomID) references Rooms(roomID),
);
```

Functional Dependencies:

roomID, peopleID, dateOfArrival → dateOfDeparture

roomID Integer	peopleID Integer	dateOfArrival Date	dateOfDeparture Date
1	8	2014-04-01	2014-04-03
2	9	2014-09-16	2014-09-17
3	10	2015-11-07	2015-11-09
1	11	2015-03-10	2015-03-15
3	12	2015-05-22	2015-05-24
6	13	2015-06-17	2015-06-19
4	14	2016-08-19	2016-08-22

ProgressReports

Lists all the checkup reports on alpacas for each sanctuary.

```
CREATE TABLE IF NOT EXISTS ProgressReports(
peopleID INT,
alpacaID INT,
dateOfReport DATE,
conditionOf TEXT,
treatment TEXT,
PRIMARY KEY(peopleID, alpacaID),
FOREIGN KEY(peopleID) references People(peopleID),
FOREIGN KEY(alpacaID) references Alpacas(alpacaID),
);
```

Functional Dependencies:

peopleID, alpacaID → dateOfReport, conditionOf, treatment

peopleID Integer	alpacaID Integer	dateOfReport Date	conditionOf Text	treatment Text
1	2	2013-11-22	Stable	Checkup
2	1	2014-10-20	Stable	Vaccine
2	4	2014-02-10	Stable	Vaccine
1	6	2014-02-07	Flu	Checkup
1	5	2014-03-06	Stable	Checkup
6	3	2015-07-18	Flu	Vaccine
6	7	2015-07-20	Swollen Hoof	Ice, Anti-swelling medicine

AlpacaStatus

Lists each Alpaca’s temperament.

```
CREATE TABLE IF NOT EXISTS AlpacaStatus(
statusCode INT,
statusDescription TEXT,
PRIMARY KEY(statusCode)
);
```

Functional Dependencies:

statusCode → statusDescription

statusCode	statusDescription
Integer	Text
100	Loves Attention
101	Docile
102	Doesn’t like strangers
103	Moody

StaffStatus

Lists the employee’s job at the sanctuary.

```
CREATE TABLE IF NOT EXISTS StaffStatus(
staffStatusCode INT,
staffStatusDescription TEXT,
PRIMARY KEY(staffStatusCode)
);
```

Functional Dependencies:

staffStatusCode → staffStatusDescription

staffStatusCode Integer	staffStatusDescription Text
100	Housekeeping
101	Maintenance
102	Animal Expert
103	Veterinarian

Staff

Lists all the staff and their basic attributes.

```
CREATE TABLE IF NOT EXISTS Staff(
peopleID INT,
dateJoined DATE,
dateLeft DATE,
staffStatusCode INT,
sanctuaryID INT,
PRIMARY KEY(peopleID),
FOREIGN KEY(peopleID) references People(peopleID),
FOREIGN KEY(staffStatusCode) references StaffStatus(staffStatusCode),
FOREIGN KEY(sanctuaryID) references Sanctuaries(sanctuaryID)
);
```

Functional Dependencies:

peopleID → dateJoined, dateLeft, staffStatusCode, sanctuaryID

peopleID Integer	dateJoined Date	dateLeft Date	staffStatusCode Integer	sanctuaryID Integer
1	2000-08-10	NULL	102	2
2	2001-03-07	NULL	103	2
3	2001-04-16	2001-06-15	100	2
4	2002-06-20	2012-07-21	101	2
5	2005-11-29	NULL	100	2
6	2005-12-01	NULL	103	2
7	2006-07-08	NULL	101	2

Addresses

Lists the addresses of all people.

```
CREATE TABLE IF NOT EXISTS Addresses(
addressID SERIAL,
peopleID INT,
streetName TEXT,
streetNum INT,
zipCode INT,
stateCode TEXT,
countryCode TEXT,
PRIMARY KEY(addressID, peopleID),
FOREIGN KEY(countryCode) references Countries(countryCode),
FOREIGN KEY(peopleID) references People(peopleID)
);
```

Functional Dependencies:

addressID, peopleID → streetName, streetNum, zipCode, stateCode, countryCode

addressID	peopleID	streetName	streetNum	zipCode	stateCode	countryCode
Serial	Integer	Text	Integer	Integer	Text	Text
1	1	Grove Street	44	07455	CT	USA
2	2	Pearl Street	122	11320	AL	USA
3	3	Harbor Parkway	35	77732	FL	USA
4	4	Cow Hill Road	89	59851	GA	USA
5	5	Pratt Road	200	33465	CA	USA
6	6	Goose Lane	75	99651	NY	USA
7	7	Main Street	652	26788	MA	USA
8	8	State Street	63	12451	NJ	USA
9	9	Lincoln Road	32	77733	FL	USA
10	10	Bush Lane	90	99653	NY	USA
11	11	Jersey Drive	81	80012	MN	USA
12	12	Sunset Lane	23	48370	MO	USA
13	13	Birchwood Road	26	99648	NY	USA
14	14	Lonely Lane	55	07454	CT	USA

Alpacas

Lists all alpacas along with their basic attributes.

```
CREATE TABLE IF NOT EXISTS Alpacas(
alpacaID SERIAL,
name TEXT,
gender TEXT,
conditionOnArrival TEXT,
dateOfArrival DATE,
dateOfDeparture DATE,
deceased BOOLEAN,
dateDeceased DATE,
statusCode INT,
countryCode TEXT,
sanctuaryID INT,
PRIMARY KEY(alpacaID),
FOREIGN KEY(statusCode) references AlpacaStatus(statusCode),
FOREIGN KEY(countryCode) references Countries(countryCode),
FOREIGN KEY(sanctuaryID) references Sanctuaries(sanctuaryID)
);
```

Functional Dependencies:

alpacaID → name, gender, conditionOnArrival, dateOfArrival, dateOfDeparture, deceased, dateDeceased, statusCode, countryCode, sanctuaryID

alpacaID Serial	name Text	gender Text	conditionOnArrival Text	dateOfArrival Date	dateOfDeparture Date	deceased Boolean	dateDeceased Date	statusCode Integer	countryCode Text	sanctuaryID Integer
1	Alfredo	Male	Broken Ankle	2001-04-06	2008-03-17	False	NULL	100	USA	2
2	Perry	Male	Swollen Leg	2001-07-10	2006-05-09	False	NULL	101	USA	2
3	Sammy	Male	Stable	2002-01-05	NULL	False	NULL	103	USA	2
4	Alma	Female	Flu	2003-03-12	2010-01-14	True	2010-01-14	102	USA	2
5	Spots	Female	Virus	2003-06-25	NULL	False	NULL	101	USA	2
6	Franny	Female	Stable	2004-02-16	NULL	False	NULL	100	USA	2
7	Matt	Male	Stable	2006-05-20	NULL	False	NULL	101	USA	2

People

Lists all people including staff and guests.

```
CREATE TABLE IF NOT EXISTS People(
peopleID SERIAL,
firstName TEXT,
lastName TEXT,
dateOfBirth DATE,
gender TEXT,
emailAddress TEXT,
PRIMARY KEY(peopleID)
);
```

Functional Dependencies:

peopleID → firstName, lastName, dateOfBirth, gender, emailAddress

peopleID	firstName	lastName	dateOfBirth	gender	emailAddress
Serial	Text	Text	Date	Text	Text
1	Robert	Sun	1970-12-12	Male	BobSun@gmail.com
2	Sally	Hensen	1971-03-10	Female	SallyH@yahoo.com
3	Barbara	Scofield	1980-03-22	Female	Barbbb@gmail.com
4	Michael	Scott	1960-06-19	Male	Mscott@gmail.com
5	Sarah	Smith	1975-12-05	Female	SSHH@comcast.net
6	Martin	Mathers	1980-01-13	Male	MandM@gmail.com
7	George	Lopez	1978-02-02	Male	Georgie@yahoo.com
8	Sam	Daniels	1966-05-11	Male	SamDaniels@hotmail.com
9	Danny	West	1968-10-04	Male	EastWest@yahoo.com
10	Robin	Tulip	1984-01-14	Female	TulipFlowers@gmail.com
11	Amanda	Bush	1977-06-23	Female	Amanda123@gmail.com
12	Casey	Smith	1994-11-18	Female	CaseyS444@hotmail.com
13	Jaime	Jobs	1989-12-09	Male	JJ@yahoo.com
14	Alex	Frost	1997-08-25	Male	Frosty@comcast.net

Guests

This lists all the guests at the sanctuary as well as what rooms they are staying in.

```
CREATE TABLE IF NOT EXISTS Guests(
peopleID INT,
PRIMARY KEY(peopleID),
FOREIGN KEY (peopleID) references People(peopleID)
);
```

Functional Dependencies:

peopleID → N/A

peopleID Integer
8
9
10
11
12
13
14

Views

StaffInformation

Lists the IDs, names, and positions of all staff.

```
CREATE VIEW StaffInformation AS
        SELECT s.peopleID , p.firstName, p.lastName, c.staffStatusDescription AS job
        FROM People p
        INNER JOIN Staff s
        ON p.peopleID = s.peopleID
        LEFT JOIN StaffStatus c
        ON s.staffStatusCode = c.staffStatusCode
        ORDER BY peopleID ASC;
```

peopleID Integer	firstName Text	lastName Text	job Text
1	Robert	Sun	Animal Expert
2	Sally	Hensen	Veterinarian
3	Barbara	Scofield	Housekeeping
4	Michael	Scott	Maintenance
5	Sarah	Smith	Housekeeping
6	Martin	Mathers	Veterinarian
7	George	Lopez	Maintenance

AlpacaInformation

Lists the IDs, names, and temperament of all alpacas.

```
CREATE VIEW AlpacaInformation AS
        SELECT a.alpacaID as ID, a.name, s.statusDescription AS temperament
        FROM Alpacas a
        INNER JOIN AlpacaStatus s
        ON a.statusCode = s.statusCode
        ORDER BY ID ASC;
```

ID Integer	name Text	temperament Text
1	Alfredo	Loves Attention
2	Perry	Docile
3	Sammy	Moody
4	Alma	Doesn’t like strangers
5	Spots	Docile
6	Franny	Loves Attention
7	Matt	Docile

Reports

Percentage of Guests Under 30

This will return the percentage of guests who are under 30 years old.

```
SELECT TRUNC (
        CAST (
                ( SELECT COUNT (People.peopleID) AS under30
                FROM  People
                LEFT JOIN Guests
                ON People.peopleID = Guests.peopleID
                WHERE date_part (‘year’, age (dateOfBirth) ) < 30
                ) as decimal (5,2)
        )
        /
        ( SELECT COUNT (peopleID) AS allGuests
        FROM Guests
        )
        *100
        ) as percentUnder30;
```

percentUnder30
42

Sanctuaries and Alpacas From the Same Country

This will display the names of sanctuaries and alpacas who have the same countryCode.

```
SELECT s.sanctuaryName, s.countryCode, a.name
FROM Sanctuaries s
INNER JOIN Alpacas a
ON s.countryCode = a.countryCode
ORDER BY s.countryCode DESC;
```

sanctuaryName Text	countryCode Text	Name Text
Alpaca Haven	USA	Alfredo
Alpaca Haven	USA	Perry
Alpaca Haven	USA	Sammy
Alpaca Haven	USA	Alma
Alpaca Haven	USA	Spots
Alpaca Haven	USA	Franny
Alpaca Haven	USA	Matt

Fired Staff

Shows all staff that have been fired who once worked under the Alpaca Oasis Organization.

```
SELECT p.firstName, p.lastName, c.staffStatusDescription, s.dateJoined, s.dateLeft
FROM People p
INNER JOIN Staff s
ON p.peopleID = s.peopleID
INNER JOIN staffStatus c
ON c.staffStatusCode = s.staffStatusCode
WHERE s.dateLeft IS NOT NULL
ORDER BY s.peopleID DESC;
```

firstName Text	lastName Text	staffStatusDescription Text	dateJoined Date	dateLeft Date
Michael	Scott	Maintenance	2002-06-20	2012-07-21
Barbara	Scofield	Housekeeping	2001-04-16	2001-06-15

Deceased Alpacas

Displays all alpacas from any sanctuaries under the Alpaca Oasis Organization that have died.

```
SELECT a.name, a.gender, s.sanctuaryName, a.dateOfArrival,
a.dateDeceased
FROM Alpacas a
INNER JOIN Sanctuaries s
ON a.sanctuaryID = s.sanctuaryID
WHERE a.dateDeceased IS NOT NULL
ORDER BY a.dateDeceased ASC;
```

Name Text	Gender Text	SanctuaryName Text	dateOfArrival Date	dateDeceased Date
Alma	Female	Alpaca Haven	2003-03-12	2010-01-14

All Progress Reports from Animal Experts

This will show all the progress reports entered by animal experts. This can also be modified to show just reports entered by veterinarians as both vets and animal experts can perform progress reports on alpacas.

```
SELECT p.firstName, p.lastName, s.sanctuaryName,d.staffStatusDescription, a.name, r.dateOfReport, r.conditionOf, r.treatment
FROM Staff c
INNER JOIN StaffStatus d
ON c.staffStatusCode = d.staffStatusCode
INNER JOIN People p
ON p.peopleID = c.peopleID
INNER JOIN ProgressReports r
ON p.peopleID = r.peopleID
INNER JOIN Alpacas a
ON r.alpacaID = a.alpacaID
INNER JOIN Sanctuaries s
ON a.sanctuaryID = s.sanctuaryID
WHERE c.staffStatusCode = 102
ORDER BY r.dateOfReport ASC;
```

firstName Text	lastName Text	sactuaryName Text	staffStatusDescription Text	Name Text	dateOfReport Date	ConditionOf Text	Treatment Text
Robert	Sun	Alpaca Haven	Animal Expert	Perry	2013-11-22	Stable	Checkup
Robert	Sun	Alpaca Haven	Animal Expert	Franny	2014-02-07	Flu	Checkup
Robert	Sun	Alpaca Haven	Animal Expert	Spots	2014-03-06	Stable	Checkup

Stored Procedures

Age Calculation

This will calculate the age of a person that is in the People table.

```
CREATE OR REPLACE FUNCTION CalculateAge(peopleID INT) AS
$$
DECLARE
        age DATE := (SELECT EXTRACT (YEAR FROM age
(CURRENT_DATE, (SELECT dateOfBirth FROM People
                        WHERE People.peopleID = peopleID))));
BEGIN
        RETURN age;
END;
$$ LANGUAGE plpgsql;
```

Valid Input Check

This checks to see if a new row in the People table has inputs for the first name or last name and date of birth that are not null. A person can have only a last name, or only a first name, but both can’t be NULL.

```
CREATE OR REPLACE FUNCTION ValidInput()
RETURNS TRIGGER AS $$
BEGIN
		IF NEW.firstName  IS NULL AND NEW.lastName IS NULL THEN
				RAISE EXCEPTION ‘firstName and lastName cannot be null’;
		END IF;
		IF NEW.dateOfBirth IS NULL THEN
				RAISE EXCEPTION ‘dateOfBirth cannot be null’;
		END IF;
		RETURN NEW;
END;
$$ LANGUAGE plpgsql;
```

**Note: The sample output for this is with the ValidInput Trigger on page 43. **

Sanctuaries' Guests

This automatically returns a table filled with the names of guests that the selected sanctuary has had visit.

```
CREATE OR REPLACE FUNCTION SanctuaryGuests(IN sanctuaryID INT)
            RETURNS TABLE (firstName text, lastName text) AS
            $$
BEGIN
RETURN QUERY SELECT DISTINCT p.firstName, p.lastName
                        FROM People p
                        INNER JOIN Guests g
                        ON p.peopleID = g.peopleID
                        INNER JOIN Bookings b
                        ON g.peopleID = b.peopleID
                        INNER JOIN Rooms r
                        ON b.roomID = r.RoomID
                        WHERE r.sanctuaryID IS NOT NULL;
END;
$$ LANGUAGE plpgsql;
```

INPUT:

SELECT SanctuaryGuests('2')

OUTPUT:

SanctuaryGuests Record
Jaime, Jobs
Amanda, Bush
Sam, Daniels
Casey, Smith
Alex, Frost
Robin, Tulip
Danny, West

Triggers

Valid Input Check

This will run the ValidInput() stored procedure whenever there is a new insert or update on the People table.

```
CREATE TRIGGER ValidInput
BEFORE INSERT OR UPDATE ON People
FOR EACH ROW
EXECUTE PROCEDURE ValidInput();
```

INPUT: (Trying to insert a person record without a first name and last name) **INSERT INTO People (dateOfBirth, gender, emailAddress) VALUES('1983-10-12', 'Female', 'NoName@gmail.com');**
OUTPUT: ERROR: firstName and lastName cannot be null ********** Error ********** ERROR: firstName and lastName cannot be null SQL state: P0001

Security

Admin

The admin of the database can see all information for all sanctuaries under the Alpaca Oasis Organization.

```
CREATE ROLE Admin;
GRANT ALL ON ALL TABLES
IN SCHEMA PUBLIC
TO Admin;
```

AnimalHandler

Employees who are either animal experts or veterinarians have access to all alpaca information, alpaca statuses, and progress reports on alpacas.

```
CREATE ROLE AnimalHandler;
GRANT SELECT, INSERT, UPDATE ON AlpacaStatus, Alpacas,
ProgressReports
TO AnimalHandler;
```

Housekeeper

All employees who are housekeepers will have access to view the bookings for rooms they are assigned to.

```
CREATE ROLE Housekeeper;
GRANT SELECT ON Bookings
TO Housekeeper;
```

Guest

All guests staying at a sanctuary will be able to see the room they are staying in with all its details as well as the list of alpacas in that sanctuary.

```
CREATE ROLE Guest;
GRANT SELECT ON Rooms, Alpacas
TO Guest;
```

Implementation Notes, Known Problems, & Future Enhancements

One thing to note is if the queries for this database are copied from these pages into the PostgreSQL query editor and there are single quotes present in the query, they will be converted to back ticks which will create an error when executing the query.

This database is an example of the sample data for one sanctuary that would be owned by the Alpaca Oasis Organization. In the Sanctuaries table, there are other sanctuaries listed, but I focused on the one in the USA. If I had included sample data for all seven different sanctuaries, it would be a very large database. So, this database is capable of handling more than one sanctuary as the Organization expands its reaches, but for ease of use for this project, I just focused on one. In the future, this model can be expanded upon to include all existing sanctuaries.