

# Non-Emergency Contact App

By: Ahna Cecil, Nathaniel Fuller, Gus Lipkin, Luis Moraguez

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## SUMMARY

Everyone knows that dialing 911 is for emergencies only, but often people need help with a non-emergency situation and finding the correct number to dial is cumbersome, especially while driving. Our application will help users quickly find the non-emergency number of relevant law enforcement agencies based off the user's location. Our application utilizes PostgreSQL to store the details of the various state, county, and local level agencies. The app would first gather the user's location and send a query to Redis to determine the closest agency based on latitude and longitude. The result of that first query would then go to Neo4J where the agency's bordering neighbors will be queried. The result of the Neo4J query will then go to PostgreSQL to query the details of the closest agency and its bordering neighbors. Those details would then be returned to the user's interface.

# Literature Review

## Background

The premise of the project is to provide a directory of non-emergency contact information to its users with the service backed by three database platforms. It is important to consider the similarities and differences between a directory and a relational database. A directory is hierarchical in nature, meaning it is organized from the top down.<sup>i</sup> This makes it easy for the user to access information due to the organizational nature of a directory and results in a fast query speed. A typical relational database, like PostgreSQL for example, is stored in the traditional table format. These tables are usually sorted and linked to other tables through the use of keys. A primary key distinguished between entries in the table, while a foreign key would link entries in one table to another. The query speed is slower than that of a directory as the database platform must search through the table to find the particular entries the user needs. However, the relational database does have a fast write speed. To add a new entry, the manager must create a new row and fill in the specified columns with information.

## Inspiration

As stated previously, the goal of the project was to make a directory backed by database platforms. The first software to do something similar was the Microsoft Active Directory built on Windows 2000.<sup>ii</sup> This software allowed for the user to navigate the database through a directory format utilizing the user-friendly query speed of the directory with the relationships and information stored in the database.<sup>iii</sup> The concept of a contact database was also important to the design of this project. Contact databases are typically used to store data and information on sales contacts by businesses.<sup>iv</sup> This was the idea of the PostgreSQL portion of the project which stores the location and contact information for the non-emergency providers.

## Utilization

Our implementation of these concepts is inspired by the usability of the Microsoft Active Directory platform and a traditional contact database. The user initiates a query which is sent through all three platforms before returning with the results to the user. It is important to allow a simplistic interface for the user to navigate the platform without sacrificing the speed and accuracy of the results.

# Database Design

POSTGRESQL

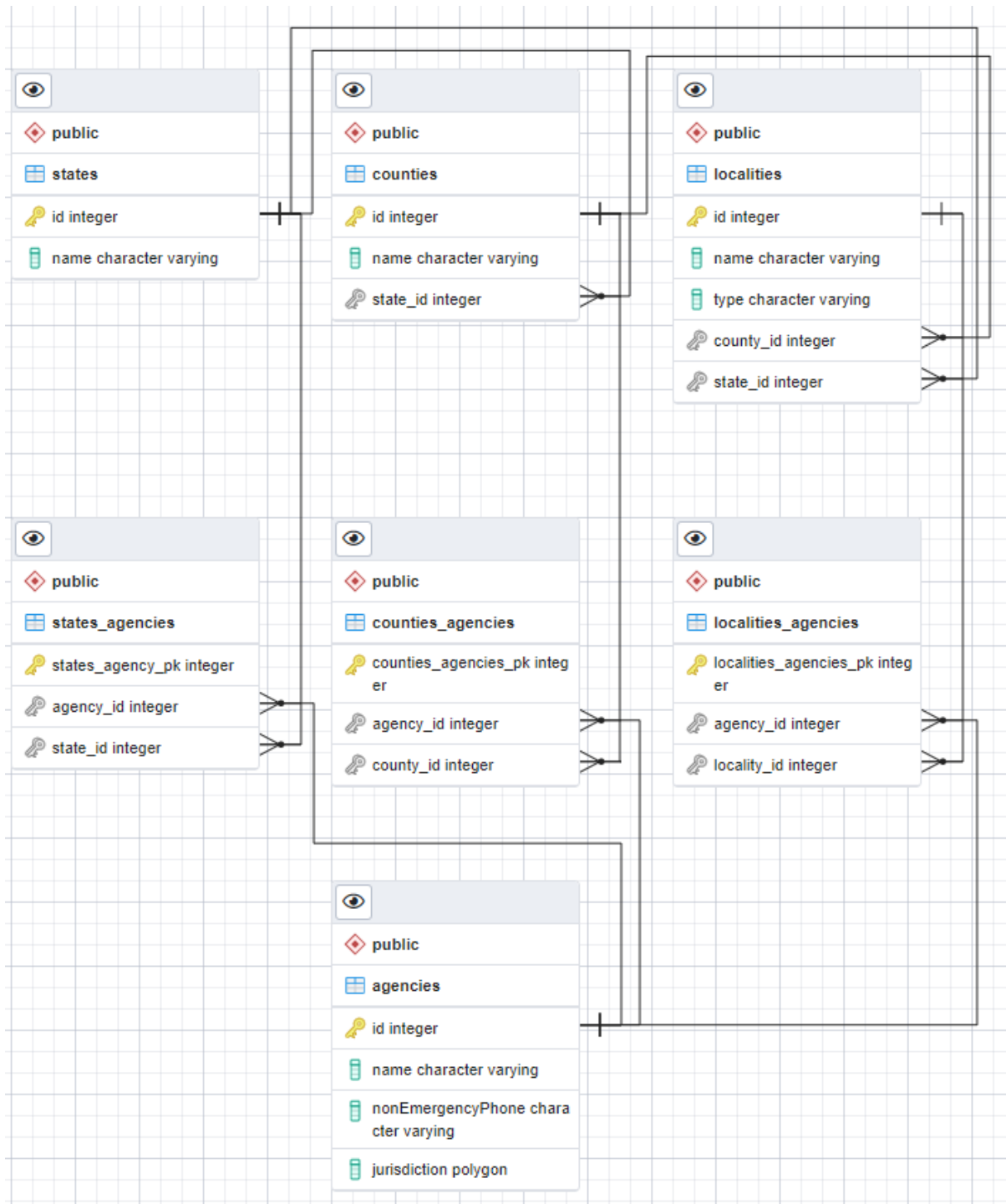


Figure 1 - ERD in 3NF showing relationships between states, counties, localities (cities, towns, etc), and agencies (police, sheriff, etc)

## Neo4J

Our Neo4J database acts essentially as a map of the communities that we serve. Depending on the agency level, this can be a map of countries, states, counties, or cities and towns. At each level, the Neo4J database shows each locality as a node, and the relationships with other nodes detail the borders between the localities. For example, at the county level in Florida, it would show that Polk county borders Lake county.

## Redis

Redis was necessary for our project for a fast in memory storage of locations that the user could query to be able to find their location. This information except the query results didn't need to be saved so an in-memory database such as, Redis is perfect for the simple passing of locational data to be used by the other databases. Currently we only have cities mapped to counties ultimately, we would like to have more specific information that would draw out more specific locational data from Redis, but just for now cities to counties is a good start. To create the Redis database a server was hosted and set commands were used to map cities to counties. From there queries would return county data to the other databases when a city name was passed.

## Next Steps

Were we able to take this application further and build it out into a real program, there are a few features we would want to add. The first would be to use a user's coordinates and hopefully direction of travel to better recommend adjacent organizations. For example, a user in north Polk County travelling north would not be recommended Manatee County which is south. We would also want a better way to pull agency data in case of changes. For this project, we manually pulled data from various sources and have no way of knowing if the data we pulled changes. With a better data sourcing system, those changes could become automatic and thus ensuring that our app is always up to date. Once those features are in place, we would like to expand to other points of interest, especially those in government such as courts, department of health offices, tax collectors, and so on. We also know that sometimes you just need a bit of help. Maybe you got a flat tire or ran out of gas or accidentally locked yourself out of your house. We would like to add a trusted contact network based on Neo4J that lets people register as a trusted contact. For example, if Luis marks that he trusts Ahna and Nate marks that he trusts Luis, then if Luis is unavailable to help, the app can recommend Ahna. This would, of course, be an opt-in feature and use at your own risk.

## Code

### POSTGRESQL

#### POSTGRESQL TO GENERATE DB, TABLES AND RELATIONS

```
BEGIN;
```

```
CREATE DATABASE "AgencyNonEmergencyContact"
```

```
WITH
```

```
OWNER = postgres
```

```
ENCODING = 'UTF8'
```

```
LC_COLLATE = 'English_United States.1252'
```

```
LC_CTYPE = 'English_United States.1252'
```

```
TABLESPACE = pg_default
```

```
CONNECTION LIMIT = -1;
```

```
-----
```

```
CREATE TABLE IF NOT EXISTS public.agencies
```

```
(
```

```
    id integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 2147483647  
    CACHE 1 ),
```

```
    name character varying COLLATE pg_catalog."default" NOT NULL,
```

```
    "nonEmergencyPhone" character varying COLLATE pg_catalog."default" NOT NULL,
```

```
    jurisdiction polygon NOT NULL,
```

```
    CONSTRAINT agencies_pkey PRIMARY KEY (id)
```

```
)
```

```
TABLESPACE pg_default;
```

```
ALTER TABLE public.agencies
```

```
    OWNER to postgres;
```

```
-----
```

```
CREATE TABLE IF NOT EXISTS public.counties
```

```
(
```



```

        id integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 2147483647
        CACHE 1 ),
        name character varying COLLATE pg_catalog."default" NOT NULL,
        state_id integer NOT NULL,
        CONSTRAINT counties_pkey PRIMARY KEY (id),
        CONSTRAINT counties_state_id_fkey FOREIGN KEY (state_id)
            REFERENCES public.states (id) MATCH SIMPLE
            ON UPDATE NO ACTION
            ON DELETE NO ACTION
            NOT VALID
    )

```

```

TABLESPACE pg_default;

```

```

ALTER TABLE public.counties
    OWNER to postgres;

```

```

-----

```

```

CREATE TABLE IF NOT EXISTS public.counties_agencies
(
    counties_agencies_pk integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1
    MAXVALUE 2147483647 CACHE 1 ),
    agency_id integer NOT NULL,
    county_id integer NOT NULL,
    CONSTRAINT counties_agencies_pkey PRIMARY KEY (counties_agencies_pk),
    CONSTRAINT counties_agencies_agency_id_fkey FOREIGN KEY (agency_id)
        REFERENCES public.agencies (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID,
    CONSTRAINT counties_agencies_county_id_fkey FOREIGN KEY (county_id)
        REFERENCES public.counties (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

```

```
TABLESPACE pg_default;
```

```
ALTER TABLE public.counties_agencies  
    OWNER to postgres;
```

```
-----
```

```
CREATE TABLE IF NOT EXISTS public.localities
```

```
(  
    id integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 2147483647  
    CACHE 1 ),  
    name character varying COLLATE pg_catalog."default" NOT NULL,  
    type character varying COLLATE pg_catalog."default" NOT NULL,  
    county_id integer,  
    state_id integer NOT NULL,  
    CONSTRAINT localities_pkey PRIMARY KEY (id),  
    CONSTRAINT localities_county_id_fkey FOREIGN KEY (county_id)  
        REFERENCES public.counties (id) MATCH SIMPLE  
        ON UPDATE NO ACTION  
        ON DELETE NO ACTION  
        NOT VALID,  
    CONSTRAINT localities_state_id_fkey FOREIGN KEY (state_id)  
        REFERENCES public.states (id) MATCH SIMPLE  
        ON UPDATE NO ACTION  
        ON DELETE NO ACTION  
        NOT VALID  
)
```

```
TABLESPACE pg_default;
```

```
ALTER TABLE public.localities  
    OWNER to postgres;
```

```
-----
```

```

CREATE TABLE IF NOT EXISTS public.localities_agencies
(
    localities_agencies_pk integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1
MAXVALUE 2147483647 CACHE 1 ),
    agency_id integer NOT NULL,
    locality_id integer NOT NULL,
    CONSTRAINT localities_agencies_pkey PRIMARY KEY (localities_agencies_pk),
    CONSTRAINT localities_agencies_agency_id_fkey FOREIGN KEY (agency_id)
        REFERENCES public.agencies (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID,
    CONSTRAINT localities_agencies_locality_id_fkey FOREIGN KEY (locality_id)
        REFERENCES public.localities (id) MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
        NOT VALID
)

```

```

TABLESPACE pg_default;

```

```

ALTER TABLE public.localities_agencies
    OWNER to postgres;

```

```

-----

```

```

CREATE TABLE IF NOT EXISTS public.states
(
    id integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1 MAXVALUE 2147483647
CACHE 1 ),
    code character(2) COLLATE pg_catalog."default" NOT NULL,
    name character varying COLLATE pg_catalog."default" NOT NULL,
    CONSTRAINT states_pkey PRIMARY KEY (id)
)

```

```

TABLESPACE pg_default;

```

```
ALTER TABLE public.states  
    OWNER to postgres;
```

-----

```
CREATE TABLE IF NOT EXISTS public.states_agencies  
(  
    states_agency_pk integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 1 MINVALUE 1  
MAXVALUE 2147483647 CACHE 1 ),  
    agency_id integer NOT NULL,  
    state_id integer NOT NULL,  
    CONSTRAINT states_agencies_pkey PRIMARY KEY (states_agency_pk),  
    CONSTRAINT states_agencies_agency_id_fkey FOREIGN KEY (agency_id)  
        REFERENCES public.agencies (id) MATCH SIMPLE  
        ON UPDATE NO ACTION  
        ON DELETE NO ACTION  
        NOT VALID,  
    CONSTRAINT states_agencies_state_id_fkey FOREIGN KEY (state_id)  
        REFERENCES public.states (id) MATCH SIMPLE  
        ON UPDATE NO ACTION  
        ON DELETE NO ACTION  
        NOT VALID  
)  
  
TABLESPACE pg_default;  
  
ALTER TABLE public.states_agencies  
    OWNER to postgres;  
  
END;
```

## POSTGRESQL TO INSERT DATA

```
INSERT INTO public.agencies(  
    name, address, "nonEmergencyPhone", jurisdiction)
```

# VALUES

('Alachua Sheriff''s Office','PO Box 5489, Gainesville, FL 32627','352-367-4000','((1,1),(1,2),(2,2),(2,1))'),

('Baker Sheriff''s Office','1 Sheriff''s Office Drive, Macclenny, FL 32063','904-259-2231','((1,1),(1,2),(2,2),(2,1))'),

('Bay Sheriff''s Office','3421 N Highway 77, Panama City, FL 32405','850-747-4700','((1,1),(1,2),(2,2),(2,1))'),

('Bradford Sheriff''s Office','PO Box 400, Starke, FL 32091','904-966-2276','((1,1),(1,2),(2,2),(2,1))'),

('Brevard Sheriff''s Office','700 S Park Avenue, Titusville, FL 32780','321-264-5201','((1,1),(1,2),(2,2),(2,1))'),

('Broward Sheriff''s Office','2601 W Broward Blvd, Ft. Lauderdale, FL 33312','954-831-8901','((1,1),(1,2),(2,2),(2,1))'),

('Calhoun Sheriff''s Office','20776 Central Avenue E, Blountstown, FL 32424','850-674-5049','((1,1),(1,2),(2,2),(2,1))'),

('Charlotte Sheriff''s Office','7474 Utilities Road, Punta Gorda, FL 33982','941-639-2101','((1,1),(1,2),(2,2),(2,1))'),

('Citrus Sheriff''s Office','1 Dr Martin Luther King Jr Avenue, Inverness, FL 34450','352-726-4488','((1,1),(1,2),(2,2),(2,1))'),

('Clay Sheriff''s Office','PO Box 548, Green Cove Springs, FL 32043','904-284-7575','((1,1),(1,2),(2,2),(2,1))'),

('Collier Sheriff''s Office','3319 Tamiami Trail East, Naples, FL 34112','239-252-0555','((1,1),(1,2),(2,2),(2,1))'),

('Columbia Sheriff''s Office','4917 E US Highway 90, Lake City, FL 32055','386-752-9212','((1,1),(1,2),(2,2),(2,1))'),

('DeSoto Sheriff''s Office','208 E Cypress Street, Arcadia, FL 34266','863-993-4700','((1,1),(1,2),(2,2),(2,1))'),

('Dixie Sheriff''s Office','PO Box 470, Cross City, FL 32628','352-498-1220','((1,1),(1,2),(2,2),(2,1))'),

('Duval/Jacksonville Sheriff''s Office','501 E Bay Street, Jacksonville, FL 32202','904-630-2120','((1,1),(1,2),(2,2),(2,1))'),

('Escambia Sheriff''s Office','PO Box 18770, Pensacola, FL 32523','850-436-9630','((1,1),(1,2),(2,2),(2,1))'),

('Flagler Sheriff''s Office','901 E. Moody Blvd., Bunnell, FL 32110','386-437-4116','((1,1),(1,2),(2,2),(2,1))'),

('Franklin Sheriff''s Office','270 State Road 65, Eastpoint, FL 32328','850-670-8519','((1,1),(1,2),(2,2),(2,1))'),

('Gadsden Sheriff''s Office','PO Box 1709, Quincy, FL 32353','850-627-9233','((1,1),(1,2),(2,2),(2,1))'),

('Gilchrist Sheriff''s Office','9239 South US Hwy 129, Trenton, FL 32693','352-463-3181','((1,1),(1,2),(2,2),(2,1))'),

('Glades Sheriff''s Office','PO Box 39, Moore Haven, FL 33471','863-946-1600','((1,1),(1,2),(2,2),(2,1))'),

('Gulf Sheriff''s Office','PO Box 970, Port St Joe, FL 32457','850-227-1115','((1,1),(1,2),(2,2),(2,1))'),

('Hamilton Sheriff''s Office','PO Drawer A, Jasper, FL 32052','386-792-2004','((1,1),(1,2),(2,2),(2,1))'),

('Hardee Sheriff''s Office','900 East Summit Street, Wauchula, FL 33873','863-773-0304','((1,1),(1,2),(2,2),(2,1))'),

('Hendry Sheriff''s Office','PO Box 579, LaBelle, FL 33975','863-674-5603','((1,1),(1,2),(2,2),(2,1))'),

('Hernando Sheriff''s Office','PO Box 10070, Brooksville, FL 34603','352-754-6830','((1,1),(1,2),(2,2),(2,1))'),

('Highlands Sheriff''s Office','400 South Eucalyptus Street, Sebring, FL 33870','863-402-7200','((1,1),(1,2),(2,2),(2,1))'),

('Hillsborough Sheriff''s Office','PO Box 3371, Tampa, FL 33601','813-247-8000','((1,1),(1,2),(2,2),(2,1))'),

('Holmes Sheriff''s Office','211 N Oklahoma Street , Bonifay, FL 32425','850-547-4421','((1,1),(1,2),(2,2),(2,1))'),

('Indian River Sheriff''s Office','4055 41st Avenue, Vero Beach, FL 32960','772-569-8144','((1,1),(1,2),(2,2),(2,1))'),

('Jackson Sheriff''s Office','4012 Lafayette Street, Marianna, FL 32446','850-482-9017','((1,1),(1,2),(2,2),(2,1))'),

('Jefferson Sheriff''s Office','171 Industrial Park, Monticello, FL 32344','850-997-0756','((1,1),(1,2),(2,2),(2,1))'),

('Lafayette Sheriff''s Office','PO Box 227, Mayo, FL 32066','386-294-1190','((1,1),(1,2),(2,2),(2,1))'),

('Lake Sheriff''s Office','360 W Ruby Street, Tavares, FL 32778','352-343-9505','((1,1),(1,2),(2,2),(2,1))'),

('Lee Sheriff''s Office','14750 Six Mile Cypress Pkwy, Ft. Myers, FL 33912','239-477-1030','((1,1),(1,2),(2,2),(2,1))'),

('Leon Sheriff''s Office','PO Box 727, Tallahassee, FL 32302','850-922-3337','((1,1),(1,2),(2,2),(2,1))'),

('Levy Sheriff''s Office','PO Drawer 1719, Bronson, FL 32621','352-486-5116','((1,1),(1,2),(2,2),(2,1))'),

('Liberty Sheriff''s Office','PO Box 67, Bristol, FL 32321','850-643-1191','((1,1),(1,2),(2,2),(2,1))'),

('Madison Sheriff''s Office','2364 W. US 90, Madison, FL 32340','850-973-8508','((1,1),(1,2),(2,2),(2,1))'),

('Manatee Sheriff''s Office','600 US Hwy 301 Blvd W #202, Bradenton, FL 34205','941-749-5401','((1,1),(1,2),(2,2),(2,1))'),

('Marion Sheriff''s Office','PO Box 1987, Ocala, FL 34478','352-620-7209','((1,1),(1,2),(2,2),(2,1))'),

('Martin Sheriff''s Office','800 SE Monterey Road, Stuart, FL 34994','772-320-4747','((1,1),(1,2),(2,2),(2,1))'),

('Miami-Dade Sheriff''s Office','9105 NW 25th Street, Miami, FL 33172','305-471-2163','((1,1),(1,2),(2,2),(2,1))'),

('Monroe Sheriff''s Office','5525 College Road, Key West, FL 33040','305-292-7099','((1,1),(1,2),(2,2),(2,1))'),

('Nassau Sheriff''s Office','77151 Citizens Circle, Yulee, FL 32097','904-225-0443','((1,1),(1,2),(2,2),(2,1))'),

('Okaloosa Sheriff''s Office','50 Second Street, Shalimar, FL 32579','850-609-3048','((1,1),(1,2),(2,2),(2,1))'),

('Okeechobee Sheriff''s Office','PO Drawer 1397, Okeechobee, FL 34973','863-763-6366','((1,1),(1,2),(2,2),(2,1))'),

('Orange Sheriff''s Office','PO Box 1440, Orlando, FL 32802','407-254-7014','((1,1),(1,2),(2,2),(2,1))'),

('Osceola Sheriff''s Office','2601 E Irlo Bronson Memorial Hwy, Kissimmee, FL 34744','407-348-1115','((1,1),(1,2),(2,2),(2,1))'),

('Palm Beach Sheriff''s Office','PO Box 24681, West Palm Beach, FL 33416','561-688-3033','((1,1),(1,2),(2,2),(2,1))'),

('Pasco Sheriff''s Office','8700 Citizen Drive, New Port Richey, FL 34654','727-844-7742','((1,1),(1,2),(2,2),(2,1))'),

('Pinellas Sheriff''s Office','PO Box 2500, Largo, FL 33779','727-582-6459','((1,1),(1,2),(2,2),(2,1))'),

('Polk Sheriff''s Office','1891 Jim Keene Blvd. , Winter Haven, FL 33880','863-298-6518','((1,1),(1,2),(2,2),(2,1))'),

('Putnam Sheriff''s Office','PO Drawer 1578, Palatka, FL 32178','386-329-0484','((1,1),(1,2),(2,2),(2,1))'),

('Santa Rosa Sheriff''s Office','PO Box 7129, Milton, FL 32572','850-983-1129','((1,1),(1,2),(2,2),(2,1))'),

('Sarasota Sheriff''s Office','PO Box 4115, Sarasota, FL 34230','941-378-0951','((1,1),(1,2),(2,2),(2,1))'),

('Seminole Sheriff''s Office','100 Eslinger Way, Sanford, FL 32773','407-665-6654','((1,1),(1,2),(2,2),(2,1))'),

('St Johns Sheriff''s Office','4015 Lewis Speedway, St. Augustine, FL 32084','904-810-6782','((1,1),(1,2),(2,2),(2,1))'),

('St Lucie Sheriff''s Office','4700 W Midway Road, Ft Pierce, FL 34981','772-489-5851','((1,1),(1,2),(2,2),(2,1))'),

('Sumter Sheriff''s Office','7361 Powell Road, Wildwood, FL 34785','352-569-1601','((1,1),(1,2),(2,2),(2,1))'),

('Suwannee Sheriff''s Office','200 South Ohio/MLK Ave Ste 105, Live Oak, FL 32064','386-362-2222','((1,1),(1,2),(2,2),(2,1))'),

('Taylor Sheriff''s Office','108 N Jefferson Street Ste 103, Perry, FL 32347','850-584-4225','((1,1),(1,2),(2,2),(2,1))'),

('Union Sheriff''s Office','55 W Main Street Room 102, Lake Butler, FL 32054','386-496-2501','((1,1),(1,2),(2,2),(2,1))'),

('Volusia Sheriff''s Office','PO Box 569 , DeLand, FL 32721','386-736-5961','((1,1),(1,2),(2,2),(2,1))'),

('Wakulla Sheriff''s Office','15 Oak Street, Crawfordville, FL 32327','850-745-7100','((1,1),(1,2),(2,2),(2,1))'),

('Walton Sheriff''s Office','752 Triple G Road, DeFuniak Springs, FL 32433','850-892-8186','((1,1),(1,2),(2,2),(2,1))'),

('Washington Sheriff''s Office','PO Box 626, Chipley, FL 32428','850-638-6111','((1,1),(1,2),(2,2),(2,1))'),

('Kissimmee Police Department','8 N Stewart Ave, Kissimmee, FL 34741','407-846-3333','((1,1),(1,2),(2,2),(2,1))')

```
        ('Florida Highway Patrol','2908 Ridgeway St, Tallahassee, FL  
32310','*347','((1,1),(1,2),(2,2),(2,1))');
```

```
INSERT INTO public.counties(  
    name, state_id)  
VALUES  
    ('ALACHUA', 15),  
    ('BAKER', 15),  
    ('BAY', 15),  
    ('BRADFORD', 15),  
    ('BREVARD', 15),  
    ('BROWARD', 15),  
    ('CALHOUN', 15),  
    ('CHARLOTTE', 15),  
    ('CITRUS', 15),  
    ('CLAY', 15),  
    ('COLLIER', 15),  
    ('COLUMBIA', 15),  
    ('DESOTO', 15),  
    ('DIXIE', 15),  
    ('DUVAL', 15),  
    ('ESCAMBIA', 15),  
    ('FLAGLER', 15),  
    ('FRANKLIN', 15),  
    ('GADSDEN', 15),  
    ('GILCHRIST', 15),  
    ('GLADES', 15),  
    ('GULF', 15),  
    ('HAMILTON', 15),  
    ('HARDEE', 15),  
    ('HENDRY', 15),  
    ('HERNANDO', 15),  
    ('HIGHLANDS', 15),  
    ('HILLSBOROUGH', 15),  
    ('HOLMES', 15),
```



('INDIAN RIVER', 15),  
( 'JACKSON', 15),  
( 'JEFFERSON', 15),  
( 'LAFAYETTE', 15),  
( 'LAKE', 15),  
( 'LEE', 15),  
( 'LEON', 15),  
( 'LEVY', 15),  
( 'LIBERTY', 15),  
( 'MADISON', 15),  
( 'MANATEE', 15),  
( 'MARION', 15),  
( 'MARTIN', 15),  
( 'MIAMI-DADE', 15),  
( 'MONROE', 15),  
( 'NASSAU', 15),  
( 'OKALOOSA', 15),  
( 'OKEECHOBEE', 15),  
( 'ORANGE', 15),  
( 'OSCEOLA', 15),  
( 'PALM BEACH', 15),  
( 'PASCO', 15),  
( 'PINELLAS', 15),  
( 'POLK', 15),  
( 'PUTNAM', 15),  
( 'SANTA ROSA', 15),  
( 'SARASOTA', 15),  
( 'SEMINOLE', 15),  
( 'ST. JOHNS', 15),  
( 'ST. LUCIE', 15),  
( 'SUMTER', 15),  
( 'SUWANNEE', 15),  
( 'TAYLOR', 15),  
( 'UNION', 15),  
( 'VOLUSIA', 15),  
( 'WAKULLA', 15),

```
    ('WALTON', 15),  
    ('WASHINGTON', 15);
```

```
INSERT INTO public.counties_agencies(  
    agency_id, county_id)
```

```
VALUES
```

```
    (1, 1),  
    (2, 2),  
    (3, 3),  
    (4, 4),  
    (5, 5),  
    (6, 6),  
    (7, 7),  
    (8, 8),  
    (9, 9),  
    (10, 10),  
    (11, 11),  
    (12, 12),  
    (13, 13),  
    (14, 14),  
    (15, 15),  
    (16, 16),  
    (17, 17),  
    (18, 18),  
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('Zolfo Springs',' ',24,15);

```

```

INSERT INTO public.localities_agencies(
    agency_id, locality_id)
VALUES (68, 387); -- Kissimmee Police Department, Kissimmee

```

```

INSERT INTO public.states(
    code, name)
VALUES
    ('AL', 'ALABAMA'),
    ('AK', 'ALASKA'),
    ('AB', 'ALBERTA'),
    ('AS', 'AMERICAN SAMOA'),
    ('AZ', 'ARIZONA'),
    ('AR', 'ARKANSAS'),
    ('BC', 'BRITISH COLUMBIA'),
    ('CA', 'CALIFORNIA'),
    ('PW', 'CAROLINE ISLANDS'),

```

('CO', 'COLORADO'),  
('CT', 'CONNECTICUT'),  
('DE', 'DELAWARE'),  
('DC', 'DISTRICT OF COLUMBIA'),  
('FM', 'FEDERATED STATE'),  
('FL', 'FLORIDA'),  
('GA', 'GEORGIA'),  
('GU', 'GUAM'),  
('HI', 'HAWAII'),  
('ID', 'IDHOA'),  
('IL', 'ILLINOIS'),  
('IN', 'INDIANA'),  
('IA', 'IOWA'),  
('KS', 'KANSAS'),  
('KY', 'KENTUCKY'),  
('LA', 'LOUSIANA'),  
('ME', 'MAINE'),  
('MB', 'MANITOBA'),  
('MP', 'MARIANA ISLANDS'),  
('MH', 'MARSHALL ISLANDS'),  
('MD', 'MARYLAND'),  
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('MI', 'MICHIGAN'),  
('MN', 'MINNESOTA'),  
('MS', 'MISSISSIPPI'),  
('MO', 'MISSOURI'),  
('MT', 'MONTANA'),  
('NE', 'NEBRASKA'),  
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('NB', 'NEW BRUNSWICK'),  
('NH', 'NEW HAMPSHIRE'),  
('NJ', 'NEW JERSEY'),  
('NM', 'NEW MEXICO'),  
('NY', 'NEW YORK'),  
('NF', 'NEWFOUNDLAND'),  
('NC', 'NORTH CAROLINA'),

```

('ND','NORTH DAKOTA'),
('NT','NORTHWEST TERRITORIES'),
('NS','NOVA SCOTIA'),
('NU','NUNAVUT'),
('OH','OHIO'),
('OK','OKLAHOMA'),
('ON','ONTARIO'),
('OR','OREGON'),
('PA','PENNSYLVANIA'),
('PE','PRINCE EDWARD ISLAND'),
('PR','PUERTO RICO'),
('PQ','QUEBEC'),
('RI','RHODE ISLAND'),
('SK','SASKATCHEWAN'),
('SC','SOUTH CAROLINA'),
('SD','SOUTH DAKOTA'),
('TN','TENNESSEE'),
('TX','TEXAS'),
('UT','UTAH'),
('VT','VERMONT'),
('VI','VIRGIN ISLANDS'),
('VA','VIRGINIA'),
('WA','WASHINGTON'),
('WV','WEST VIRGINIA'),
('WI','WISCONSIN'),
('WY','WYOMING'),
('YT','YUKON TERRITORY'),
('AE','ARMED FORCES - EUROPE'),
('AA','ARMED FORCES - AMERICAS'),
('AP','ARMED FORCES - PACIFIC');

```

```

INSERT INTO public.states_agencies(
    agency_id, state_id)
VALUES (69, 15); -- Florida Highway Patrol, Florida

```

## POSTGRESQL TO CREATE GETAGENCY FUNCTION

```
CREATE OR REPLACE FUNCTION getAgency("state" VARCHAR DEFAULT '', "county" VARCHAR DEFAULT '', "locality"
VARCHAR DEFAULT '')
RETURNS TABLE (agency_name VARCHAR, agency_address VARCHAR, agency_phone VARCHAR) LANGUAGE plpgsql
AS $$
BEGIN
    RETURN QUERY
        SELECT a.name, a.address, a."nonEmergencyPhone"
        FROM public.agencies a
        INNER JOIN public.states_agencies sa ON a.id = sa.agency_id
        INNER JOIN public.states s ON s.id = sa.state_id
        WHERE (upper("state") = upper(s.name) OR "state" = '')

        UNION

        SELECT a.name, a.address, a."nonEmergencyPhone"
        FROM public.agencies a
        INNER JOIN public.counties_agencies ca ON a.id = ca.agency_id
        INNER JOIN public.counties c ON c.id = ca.county_id
        WHERE (upper("county") = upper(c.name) OR "county" = '')

        UNION

        SELECT a.name, a.address, a."nonEmergencyPhone"
        FROM public.agencies a
        INNER JOIN public.localities_agencies la ON a.id = la.agency_id
        INNER JOIN public.localities l ON l.id = la.locality_id
        WHERE (upper("locality") = upper(l.name) OR "locality" = '');
END;$$
```

## POSTGRESQL TO CALL GETAGENCY FUNCTION

```
SELECT public.getagency('.', '.', '.');

-- State, County, Locality parameters. '' for any match, '.' for exclusion, 'SOME NAME' for exact match
```

### Neo4J

#### Database Creation

We created the database using the Neo4J graphical user interface.

## Filling the Database

CREATE

```
(escambia:County { name: "Escambia"}),
(santa_rosa:County { name: "Santa Rosa"}),
(okaloosa:County { name: "Okaloosa"}),
(walton:County { name: "Walton"}),
(holmes:County { name: "Holmes"}),
(washington:County { name: "Washington"}),
(bay:County { name: "Bay"}),
(jackson:County { name: "Jackson"}),
(calhoun:County { name: "Calhoun"}),
(gulf:County { name: "Gulf"}),
(gadsden:County { name: "Gadsden"}),
(liberty:County { name: "Liberty"}),
(franklin:County { name: "Franklin"}),
(leon:County { name: "Leon"}),
(wakulla:County { name: "Wakulla"}),
(jefferson:County { name: "Jefferson"}),
(madison:County { name: "Madison"}),
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(suwanee:County { name: "Suwanee"}),
(lafayette:County { name: "Lafayette"}),
(columbia:County { name: "Columbia"}),
(baker:County { name: "Baker"}),
(nassau:County { name: "Nassau"}),
(duval:County { name: "Duval"}),
(clay:County { name: "Clay"}),
(st_johns:County { name: "St Johns"}),
(putnam:County { name: "Putnam"}),
(flagler:County { name: "Flagler"}),
(volusia:County { name: "Volusia"}),
(union:County { name: "Union"}),
(bradford:County { name: "Bradford"}),
(alachua:County { name: "Alachua"}),
(gilchrist:County { name: "Gilchrist"}),
```



```
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(sumter:County { name: "Sumter"}),
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(st_lucie:County { name: "St Lucie"}),
(martin:County { name: "Martin"}),
(palm_beach:County { name: "Palm Beach"}),
(sarasota:County { name: "Sarasota"}),
(desoto:County { name: "DeSoto"}),
(charlotte:County { name: "Charlotte"}),
(glades:County { name: "Glades"}),
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(hendry:County { name: "Hendry"}),
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(broward:County { name: "Broward"}),
(monroe:County { name: "Monroe"}),
(miami_dade:County { name: "Miami-Dade"}),
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(orange)-[:BORDERS]->(seminole),  
(brevard)-[:BORDERS]->(orange),  
(orange)-[:BORDERS]->(osceola),  
(orange)-[:BORDERS]->(polk),  
(brevard)-[:BORDERS]->(indian\_river),  
(brevard)-[:BORDERS]->(osceola),  
(indian\_river)-[:BORDERS]->(osceola),  
(okeechobee)-[:BORDERS]->(osceola),

(highlands)-[:BORDERS]->(osceola),  
(osceola)-[:BORDERS]->(polk),  
(okeechobee)-[:BORDERS]->(polk),  
(highlands)-[:BORDERS]->(polk),  
(hardee)-[:BORDERS]->(polk),  
(manatee)-[:BORDERS]->(polk),  
(hillsborough)-[:BORDERS]->(polk),  
(hardee)-[:BORDERS]->(hillsborough),  
(hillsborough)-[:BORDERS]->(manatee),  
(hillsborough)-[:BORDERS]->(pinellas),  
(hardee)-[:BORDERS]->(manatee),  
(desoto)-[:BORDERS]->(manatee),  
(manatee)-[:BORDERS]->(sarasota),  
(hardee)-[:BORDERS]->(highlands),  
(desoto)-[:BORDERS]->(hardee),  
(highlands)-[:BORDERS]->(okeechobee),  
(glades)-[:BORDERS]->(highlands),  
(charlotte)-[:BORDERS]->(highlands),  
(desoto)-[:BORDERS]->(highlands),  
(indian\_river)-[:BORDERS]->(okeechobee),  
(okeechobee)-[:BORDERS]->(st\_lucie),  
(martin)-[:BORDERS]->(okeechobee),  
(okeechobee)-[:BORDERS]->(palm\_beach),  
(glades)-[:BORDERS]->(okeechobee),  
(indian\_river)-[:BORDERS]->(st\_lucie),  
(martin)-[:BORDERS]->(st\_lucie),  
(palm\_beach)-[:BORDERS]->(st\_lucie),  
(martin)-[:BORDERS]->(palm\_beach),  
(broward)-[:BORDERS]->(palm\_beach),  
(hendry)-[:BORDERS]->(palm\_beach),  
(glades)-[:BORDERS]->(palm\_beach),  
(desoto)-[:BORDERS]->(sarasota),  
(charlotte)-[:BORDERS]->(sarasota),  
(desoto)-[:BORDERS]->(glades),  
(charlotte)-[:BORDERS]->(desoto),  
(charlotte)-[:BORDERS]->(glades),

```
(charlotte)-[:BORDERS]->(hendry),
(charlotte)-[:BORDERS]->(lee),
(glades)-[:BORDERS]->(hendry),
(glades)-[:BORDERS]->(lee),
(hendry)-[:BORDERS]->(lee),
(collier)-[:BORDERS]->(lee),
(broward)-[:BORDERS]->(hendry),
(collier)-[:BORDERS]->(hendry),
(broward)-[:BORDERS]->(collier),
(collier)-[:BORDERS]->(miami_dade),
(collier)-[:BORDERS]->(monroe),
(broward)-[:BORDERS]->(miami_dade),
(miami_dade)-[:BORDERS]->(monroe)
```

## Redis

### Database Creation

To create the Redis database a server was created and hosted locally.

### Filling the Database

```
SET city:alachua "Alachua"
SET city:alford "Jackson"
SET city:altamonte_springs "Seminole"
SET city:altha "Calhoun"
SET city:altoona "Lake"
SET city:alva "Lee"
SET city:andover "Miami-Dade"
SET city:andrews "Levy"
SET city:anna_maria "Manatee"
SET city:apalachicola "Franklin"
SET city:apollo_beach "Hillsborough"
SET city:apopka "Orange"
SET city:arcadia "DeSoto"
SET city:archer "Alachua"
SET city:asbury_lake "Clay"
SET city:astatula "Lake"
SET city:astor "Lake"
SET city:atlantic_beach "Duval"
SET city:atlantis "Palm Beach"
```

SET city:auburndale "Polk"  
SET city:aventura "Miami-Dade"  
SET city:avon\_park "Highlands"  
SET city:azalea\_park "Orange"  
SET city:babson\_park "Polk"  
SET city:bagdad "Santa Rosa"  
SET city:bal\_harbour "Miami-Dade"  
SET city:baldwin "Duval"  
SET city:bartow "Polk"  
SET city:bascom "Jackson"  
SET city:bay\_hill "Orange"  
SET city:bay\_lake "Orange"  
SET city:bay\_pines "Pinellas"  
SET city:bayonet\_point "Pasco"  
SET city:bayport "Hernando"  
SET city:bayshore\_gardens "Manatee"  
SET city:beacon\_square "Pasco"  
SET city:bee\_ridge "Sarasota"  
SET city:bell "Gilchrist"  
SET city:bellair\_meadowbrook\_terrace "Clay"  
SET city:belle\_glade "Palm Beach"  
SET city:belle\_glade\_camp "Palm Beach"  
SET city:belle\_isle "Orange"  
SET city:belleair "Pinellas"  
SET city:belleair\_beach "Pinellas"  
SET city:belleair\_bluffs "Pinellas"  
SET city:belleair\_shore "Pinellas"  
SET city:bellevue "Marion"  
SET city:bellview "Escambia"  
SET city:beverly\_beach "Flagler"  
SET city:beverly\_hills "Citrus"  
SET city:big\_coppitt\_key "Monroe"  
SET city:big\_pine\_key "Monroe"  
SET city:biscayne\_park "Miami-Dade"  
SET city:bithlo "Orange"  
SET city:black\_diamond "Citrus"

SET city:bloomingdale "Hillsborough"

SET city:blountstown "Calhoun"

SET city:boca\_del\_mar "Palm Beach"

SET city:boca\_pointe "Palm Beach"

SET city:boca\_raton "Palm Beach"

SET city:bokeelia "Lee"

SET city:bonifay "Holmes"

SET city:bonita\_springs "Lee"

SET city:bonnie\_lock\_woodsetter\_north "Broward"

SET city:boulevard\_gardens "Broward"

SET city:bowling\_green "Hardee"

SET city:boyette "Hillsborough"

SET city:boynton\_beach "Palm Beach"

SET city:bradenton "Manatee"

SET city:bradenton\_beach "Manatee"

SET city:brandon "Hillsborough"

SET city:branford "Suwannee"

SET city:brent "Escambia"

SET city:briny\_breezes "Palm Beach"

SET city:bristol "Liberty"

SET city:broadview\_pompano\_park "Broward"

SET city:broadview\_park "Broward"

SET city:bronson "Levy"

SET city:brooker "Bradford"

SET city:brookridge "Hernando"

SET city:brooksville "Hernando"

SET city:broward\_estates "Broward"

SET city:brownsville "Miami-Dade"

SET city:buckhead\_ridge "Glades"

SET city:buckingham "Lee"

SET city:buena\_ventura\_lakes "Osceola"

SET city:bunche\_park "Miami-Dade"

SET city:bunnell "Flagler"

SET city:burnt\_store\_marina "Lee"

SET city:bushnell "Sumter"

SET city:butler\_beach "St Johns"



SET city:callahan "Nassau"  
SET city:callaway "Bay"  
SET city:campbell "Osceola"  
SET city:campbellton "Jackson"  
SET city:canal\_point "Palm Beach"  
SET city:cape\_canaveral "Brevard"  
SET city:cape\_coral "Lee"  
SET city:captiva "Lee"  
SET city:carol\_city "Miami-Dade"  
SET city:carrabelle "Franklin"  
SET city:carver\_ranches "Broward"  
SET city:caryville "Washington"  
SET city:casselberry "Seminole"  
SET city:cedar\_grove "Bay"  
SET city:cedar\_key "Levy"  
SET city:celebration "Osceola"  
SET city:center\_hill "Sumter"  
SET city:century "Escambia"  
SET city:century\_village "Palm Beach"  
SET city:chambers\_estates "Broward"  
SET city:charleston\_park "Lee"  
SET city:charlotte\_harbor "Charlotte"  
SET city:charlotte\_park "Charlotte"  
SET city:chattahoochee "Gadsden"  
SET city:cheval "Hillsborough"  
SET city:chiefland "Levy"  
SET city:chipley "Washington"  
SET city:christmas "Orange"  
SET city:chula\_vista "Broward"  
SET city:chuluota "Seminole"  
SET city:cinco\_bayou "Okaloosa"  
SET city:citrus\_hills "Citrus"  
SET city:citrus\_park "Hillsborough"  
SET city:citrus\_ridge "Lake"  
SET city:citrus\_springs "Citrus"  
SET city:clearwater "Pinellas"

SET city:clermont "Lake"  
SET city:cleveland "Charlotte"  
SET city:clewiston "Hendry"  
SET city:cloud\_lake "Palm Beach"  
SET city:cocoa "Brevard"  
SET city:cocoa\_beach "Brevard"  
SET city:cocoa\_west "Brevard"  
SET city:coconut\_creek "Broward"  
SET city:coleman "Sumter"  
SET city:collier\_manor\_cresthaven "Broward"  
SET city:combee\_settlement "Polk"  
SET city:conway "Orange"  
SET city:cooper\_city "Broward"  
SET city:coral\_gables "Miami-Dade"  
SET city:coral\_springs "Broward"  
SET city:coral\_terrace "Miami-Dade"  
SET city:cortez "Manatee"  
SET city:cottondale "Jackson"  
SET city:country\_club "Miami-Dade"  
SET city:country\_estates "Broward"  
SET city:country\_walk "Miami-Dade"  
SET city:crescent\_beach "St Johns"  
SET city:crescent\_city "Putnam"  
SET city:crestview "Okaloosa"  
SET city:crooked\_lake\_park "Polk"  
SET city:cross\_city "Dixie"  
SET city:crystal\_lake "Polk"  
SET city:crystal\_river "Citrus"  
SET city:crystal\_springs "Pasco"  
SET city:cudjoe\_key "Monroe"  
SET city:cutler "Miami-Dade"  
SET city:cutler\_ridge "Miami-Dade"  
SET city:cypress\_gardens "Polk"  
SET city:cypress\_lake "Lee"  
SET city:cypress\_lakes "Palm Beach"  
SET city:cypress\_quarters "Okeechobee"

SET city:dade\_city "Pasco"  
SET city:dade\_city\_north "Pasco"  
SET city:danial\_beach "Broward"  
SET city:davenport "Polk"  
SET city:davie "Broward"  
SET city:daytona\_beach "Volusia"  
SET city:daytona\_beach\_shores "Volusia"  
SET city:de\_bary "Volusia"  
SET city:de\_funiak\_springs "Walton"  
SET city:de\_land "Volusia"  
SET city:de\_land\_southwest "Volusia"  
SET city:de\_leon\_springs "Volusia"  
SET city:deerfield\_beach "Broward"  
SET city:delray\_beach "Palm Beach"  
SET city:deltona "Volusia"  
SET city:desoto\_lakes "Sarasota"  
SET city:destin "Okaloosa"  
SET city:doctor\_phillips "Orange"  
SET city:doral "Miami-Dade"  
SET city:doxer "Hillsborough"  
SET city:duck\_key "Monroe"  
SET city:dundee "Polk"  
SET city:dunedin "Pinellas"  
SET city:dunes\_road "Palm Beach"  
SET city:dunnellon "Marion"  
SET city:eagle\_lake "Polk"  
SET city:east\_bronson "Levy"  
SET city:east\_dunbar "Lee"  
SET city:east\_lake "Pinellas"  
SET city:east\_lake\_orient\_park "Hillsborough"  
SET city:east\_palatka "Putnam"  
SET city:east\_perrine "Miami-Dade"  
SET city:east\_williston "Levy"  
SET city:eastpoint "Franklin"  
SET city:eatonville "Orange"  
SET city:ebro "Washington"

SET city:edgewater "Volusia"  
SET city:edgewood "Orange"  
SET city:eglin\_afb "Okaloosa"  
SET city:egypt\_lake\_letto "Hillsborough"  
SET city:el\_portal "Miami-Dade"  
SET city:elfers "Pasco"  
SET city:ellenton "Manatee"  
SET city:englewood "Sarasota"  
SET city:ensley "Escambia"  
SET city:estates\_of\_fort\_lauderdale "Broward"  
SET city:estero "Lee"  
SET city:esto "Holmes"  
SET city:eustis "Lake"  
SET city:everglades "Collier"  
SET city:fairview\_shores "Orange"  
SET city:fanning\_springs "Levy"  
SET city:feather\_sound "Pinellas"  
SET city:fellsmere "Indian River"  
SET city:fern\_park "Seminole"  
SET city:fernandina\_beach "Nassau"  
SET city:ferndale "Lake"  
SET city:ferry\_pass "Escambia"  
SET city:fish\_hawk "Hillsborough"  
SET city:fisher\_island "Miami-Dade"  
SET city:five\_points "Columbia"  
SET city:flagler\_beach "Flagler"  
SET city:floral\_city "Citrus"  
SET city:florida\_city "Miami-Dade"  
SET city:florida\_ridge "Indian River"  
SET city:forest\_city "Seminole"  
SET city:fort\_lauderdale "Broward"  
SET city:fort\_meade "Polk"  
SET city:fort\_myers "Lee"  
SET city:fort\_myers\_beach "Lee"  
SET city:fort\_myers\_shores "Lee"  
SET city:fort\_pierce "St Lucie"

SET city:fort\_pierce\_north "St Lucie"  
SET city:fort\_pierce\_south "St Lucie"  
SET city:fort\_walton\_beach "Okaloosa"  
SET city:fort\_white "Columbia"  
SET city:fountainbleau "Miami-Dade"  
SET city:franklin\_park "Broward"  
SET city:freeport "Walton"  
SET city:fremd\_village\_padgett\_island "Palm Beach"  
SET city:frostproof "Polk"  
SET city:fruit\_cove "St Johns"  
SET city:fruitland\_park "Lake"  
SET city:fruitville "Sarasota"  
SET city:fussels\_corner "Polk"  
SET city:gainesville "Alachua"  
SET city:gandy "Pinellas"  
SET city:gateway "Lee"  
SET city:geneva "Seminole"  
SET city:gibsonia "Polk"  
SET city:gibsonton "Hillsborough"  
SET city:gifford "Indian River"  
SET city:gladeview "Miami-Dade"  
SET city:glen\_ridge "Palm Beach"  
SET city:glen\_st\_mary "Baker"  
SET city:glencoe "Volusia"  
SET city:glenvar\_heights "Miami-Dade"  
SET city:godfrey\_road "Broward"  
SET city:golden\_beach "Miami-Dade"  
SET city:golden\_gate "Collier"  
SET city:golden\_glades "Miami-Dade"  
SET city:golden\_heights "Broward"  
SET city:golden\_lakes "Palm Beach"  
SET city:goldenrod "Orange"  
SET city:golf "Palm Beach"  
SET city:gonzalez "Escambia"  
SET city:goodland "Collier"  
SET city:gotha "Orange"

SET city:goulding "Escambia"  
SET city:goulds "Miami-Dade"  
SET city:graceville "Jackson"  
SET city:grand\_ridge "Jackson"  
SET city:greater\_carrollwood "Hillsborough"  
SET city:greater\_northdale "Hillsborough"  
SET city:greater\_sun\_center "Hillsborough"  
SET city:green\_cove\_springs "Clay"  
SET city:green\_meadow "Broward"  
SET city:greenacres "Palm Beach"  
SET city:greensboro "Gadsden"  
SET city:greenville "Madison"  
SET city:greenwood "Jackson"  
SET city:gretna "Gadsden"  
SET city:grove\_city "Charlotte"  
SET city:groveland "Lake"  
SET city:gulf\_breeze "Santa Rosa"  
SET city:gulf\_gate\_estates "Sarasota"  
SET city:gulf\_stream "Palm Beach"  
SET city:gulfport "Pinellas"  
SET city:gun\_club\_estates "Palm Beach"  
SET city:haines\_city "Polk"  
SET city:hallandale "Broward"  
SET city:hampton "Bradford"  
SET city:hamptons\_at\_boca\_raton "Palm Beach"  
SET city:harbor\_bluffs "Pinellas"  
SET city:harbour\_heights "Charlotte"  
SET city:harlem "Hendry"  
SET city:harlem\_heights "Lee"  
SET city:hastings "St Johns"  
SET city:havana "Gadsden"  
SET city:haverhill "Palm Beach"  
SET city:hawthorne "Alachua"  
SET city:heathrow "Seminole"  
SET city:hernando "Citrus"  
SET city:hernando\_beach "Hernando"

SET city:hialeah "Miami-Dade"  
SET city:hialeah\_gardens "Miami-Dade"  
SET city:high\_point "Hernando"  
SET city:high\_springs "Alachua"  
SET city:highland\_beach "Palm Beach"  
SET city:highland\_city "Polk"  
SET city:highland\_park "Polk"  
SET city:hiland\_park "Bay"  
SET city:hill\_'n\_dale "Hernando"  
SET city:hillcrest\_heights "Polk"  
SET city:hilliard "Nassau"  
SET city:hillsboro\_beach "Broward"  
SET city:hillsboro\_pines "Broward"  
SET city:hillsboro\_ranches "Broward"  
SET city:hobe\_sound "Martin"  
SET city:holden\_heights "Orange"  
SET city:holiday "Pasco"  
SET city:holly\_hill "Volusia"  
SET city:hollywood "Broward"  
SET city:holmes\_beach "Manatee"  
SET city:homestead "Miami-Dade"  
SET city:homestead\_base "Miami-Dade"  
SET city:homosassa "Citrus"  
SET city:homosassa\_springs "Citrus"  
SET city:horseshoe\_beach "Dixie"  
SET city:howey\_in\_the\_hills "Lake"  
SET city:HUDSON "Pasco"  
SET city:hunters\_creek "Orange"  
SET city:hutchinson\_island\_south "St Lucie"  
SET city:hypoluxo "Palm Beach"  
SET city:immokalee "Collier"  
SET city:indialantic "Brevard"  
SET city:indian\_harbour\_beach "Brevard"  
SET city:indian\_river\_estates "St Lucie"  
SET city:indian\_river\_shores "Indian River"  
SET city:indian\_rocks\_beach "Pinellas"

SET city:indian\_shores "Pinellas"  
SET city:indiantown "Martin"  
SET city:inglis "Levy"  
SET city:interlachen "Putnam"  
SET city:inverness "Citrus"  
SET city:inverness\_highlands\_north "Citrus"  
SET city:inverness\_highlands\_south "Citrus"  
SET city:inwood "Polk"  
SET city:iona "Lee"  
SET city:islamorada,\_village\_of\_islands "Monroe"  
SET city:islandia "Miami-Dade"  
SET city:istachatta "Hernando"  
SET city:ivanhoe\_estates "Broward"  
SET city:ives\_estates "Miami-Dade"  
SET city:jacksonville "Duval"  
SET city:jacksonville\_beach "Duval"  
SET city:jacob\_city "Jackson"  
SET city:jan\_phyl\_village "Polk"  
SET city:jasmine\_estates "Pasco"  
SET city:jasper "Hamilton"  
SET city:jay "Santa Rosa"  
SET city:jennings "Hamilton"  
SET city:jensen\_beach "Martin"  
SET city:june\_park "Brevard"  
SET city:juno\_beach "Palm Beach"  
SET city:juno\_ridge "Palm Beach"  
SET city:jupiter "Palm Beach"  
SET city:jupiter\_inlet\_colony "Palm Beach"  
SET city:jupiter\_island "Martin"  
SET city:kathleen "Polk"  
SET city:kendale\_lakes "Miami-Dade"  
SET city:kendall "Miami-Dade"  
SET city:kendall\_green "Broward"  
SET city:kendall\_west "Miami-Dade"  
SET city:kenneth\_city "Pinellas"  
SET city:kensington\_park "Sarasota"



SET city:key\_biscayne "Miami-Dade"  
SET city:key\_colony\_beach "Monroe"  
SET city:key\_largo "Monroe"  
SET city:key\_west "Monroe"  
SET city:keystone "Hillsborough"  
SET city:keystone\_heights "Clay"  
SET city:kings\_point "Palm Beach"  
SET city:kissimmee "Osceola"  
SET city:la\_crosse "Alachua"  
SET city:labelle "Hendry"  
SET city:lacoochee "Pasco"  
SET city:lady\_lake "Lake"  
SET city:laguna\_beach "Bay"  
SET city:lake\_alfred "Polk"  
SET city:lake\_belvedere\_estates "Palm Beach"  
SET city:lake\_buena\_vista "Orange"  
SET city:lake\_butler "Union"  
SET city:lake\_butter "Orange"  
SET city:lake\_city "Columbia"  
SET city:lake\_clarke\_shores "Palm Beach"  
SET city:lake\_forest "Broward"  
SET city:lake\_hamilton "Polk"  
SET city:lake\_harbor "Palm Beach"  
SET city:lake\_hart "Orange"  
SET city:lake\_helen "Volusia"  
SET city:lake\_kathryn "Lake"  
SET city:lake\_lindsey "Hernando"  
SET city:lake\_lorraine "Okaloosa"  
SET city:lake\_lucerne "Miami-Dade"  
SET city:lake\_mack\_forest\_hills "Lake"  
SET city:lake\_magdalene "Hillsborough"  
SET city:lake\_mary "Seminole"  
SET city:lake\_panasoffkee "Sumter"  
SET city:lake\_park "Palm Beach"  
SET city:lake\_placid "Highlands"  
SET city:lake\_sarasota "Sarasota"

SET city:lake\_wales "Polk"  
SET city:lake\_worth "Palm Beach"  
SET city:lake\_worth\_corridor "Palm Beach"  
SET city:lakeland "Polk"  
SET city:lakeland\_highlands "Polk"  
SET city:lakes\_by\_the\_bay "Miami-Dade"  
SET city:lakeside "Clay"  
SET city:lakeside\_green "Palm Beach"  
SET city:lakewood\_park "St Lucie"  
SET city:land\_o'\_lakes "Pasco"  
SET city:lantana "Palm Beach"  
SET city:largo "Pinellas"  
SET city:lauderdale\_by\_the\_sea "Broward"  
SET city:lauderdale\_lakes "Broward"  
SET city:lauderhill "Broward"  
SET city:laurel "Sarasota"  
SET city:laurel\_hill "Okaloosa"  
SET city:lawtey "Bradford"  
SET city:layton "Monroe"  
SET city:lazy\_lake "Broward"  
SET city:lecanto "Citrus"  
SET city:lee "Madison"  
SET city:leesburg "Lake"  
SET city:lehigh\_acres "Lee"  
SET city:leisure\_city "Miami-Dade"  
SET city:leisureville "Broward"  
SET city:lely "Collier"  
SET city:lely\_resort "Collier"  
SET city:lighthouse\_point "Broward"  
SET city:limestone\_creek "Palm Beach"  
SET city:lisbon "Lake"  
SET city:live\_oak "Suwannee"  
SET city:loch\_lomond "Broward"  
SET city:lochmoor\_waterway\_estates "Lee"  
SET city:lockhart "Orange"  
SET city:longboat\_key "Sarasota"

SET city:longwood "Seminole"  
SET city:loughman "Polk"  
SET city:lower\_grand\_lagoon "Bay"  
SET city:lutz "Hillsborough"  
SET city:lynn\_haven "Bay"  
SET city:macclenny "Baker"  
SET city:madeira\_beach "Pinellas"  
SET city:madison "Madison"  
SET city:maitland "Orange"  
SET city:malabar "Brevard"  
SET city:malone "Jackson"  
SET city:manalapan "Palm Beach"  
SET city:manasota\_key "Charlotte"  
SET city:manatee\_road "Levy"  
SET city:mango "Hillsborough"  
SET city:mangonia\_park "Palm Beach"  
SET city:marathon "Monroe"  
SET city:marco\_island "Collier"  
SET city:margate "Broward"  
SET city:marianna "Jackson"  
SET city:marineland "Flagler"  
SET city:mary\_esther "Okaloosa"  
SET city:masaryktown "Hernando"  
SET city:mascotte "Lake"  
SET city:matlacha "Lee"  
SET city:matlacha\_isles\_matlacha\_shores "Lee"  
SET city:mayo "Lafayette"  
SET city:mcgregor "Lee"  
SET city:mcintosh "Marion"  
SET city:meadow\_woods "Orange"  
SET city:medley "Miami-Dade"  
SET city:medulla "Polk"  
SET city:melbourne "Brevard"  
SET city:melbourne\_beach "Brevard"  
SET city:melbourne\_village "Brevard"  
SET city:melrose\_park "Broward"

SET city:memphis "Manatee"  
SET city:merritt\_island "Brevard"  
SET city:mexico\_beach "Bay"  
SET city:miami "Miami-Dade"  
SET city:miami\_beach "Miami-Dade"  
SET city:miami\_gardens "Broward"  
SET city:miami\_lakes "Miami-Dade"  
SET city:miami\_shores "Miami-Dade"  
SET city:miami\_springs "Miami-Dade"  
SET city:micanopy "Alachua"  
SET city:micco "Brevard"  
SET city:middleburg "Clay"  
SET city:midway "Seminole"  
SET city:milton "Santa Rosa"  
SET city:mims "Brevard"  
SET city:minneola "Lake"  
SET city:miramar "Broward"  
SET city:miramar\_beach "Walton"  
SET city:mission\_bay "Palm Beach"  
SET city:molino "Escambia"  
SET city:monticello "Jefferson"  
SET city:montverde "Lake"  
SET city:moore\_haven "Glades"  
SET city:mount\_dora "Lake"  
SET city:mount\_plymouth "Lake"  
SET city:mulberry "Polk"  
SET city:myrtle\_grove "Escambia"  
SET city:naples "Collier"  
SET city:naples\_manor "Collier"  
SET city:naples\_park "Collier"  
SET city:naranja "Miami-Dade"  
SET city:nassau\_village\_ratliff "Nassau"  
SET city:neptune\_beach "Duval"  
SET city:new\_port\_richey "Pasco"  
SET city:new\_port\_richey\_east "Pasco"  
SET city:new\_smyrna\_beach "Volusia"

SET city:newberry "Alachua"  
SET city:niceville "Okaloosa"  
SET city:nobleton "Hernando"  
SET city:nokomis "Sarasota"  
SET city:noma "Holmes"  
SET city:norland "Miami-Dade"  
SET city:north\_andrews\_gardens "Broward"  
SET city:north\_beach "Indian River"  
SET city:north\_brooksville "Hernando"  
SET city:north\_de\_land "Volusia"  
SET city:north\_fort\_myers "Lee"  
SET city:north\_key\_largo "Monroe"  
SET city:north\_lauderdale "Broward"  
SET city:north\_miami "Miami-Dade"  
SET city:north\_miami\_beach "Miami-Dade"  
SET city:north\_palm\_beach "Palm Beach"  
SET city:north\_port "Sarasota"  
SET city:north\_redington\_beach "Pinellas"  
SET city:north\_river\_shores "Martin"  
SET city:north\_sarasota "Sarasota"  
SET city:north\_weeki\_wachee "Hernando"  
SET city:oak\_hill "Volusia"  
SET city:oak\_point "Broward"  
SET city:oak\_ridge "Orange"  
SET city:oakland "Orange"  
SET city:oakland\_park "Broward"  
SET city:ocala "Marion"  
SET city:ocean\_breeze\_park "Martin"  
SET city:ocean\_city "Okaloosa"  
SET city:ocean\_ridge "Palm Beach"  
SET city:ocoee "Orange"  
SET city:odessa "Pasco"  
SET city:ojus "Miami-Dade"  
SET city:okahumpka "Lake"  
SET city:okeechobee "Okeechobee"  
SET city:oldsmar "Pinellas"

SET city:olga "Lee"

SET city:olympia\_heights "Miami-Dade"

SET city:opa\_locka "Miami-Dade"

SET city:opa\_locka\_north "Miami-Dade"

SET city:orange\_city "Volusia"

SET city:orange\_park "Clay"

SET city:orangetree "Collier"

SET city:orchid "Indian River"

SET city:orlando "Orange"

SET city:orlovista "Orange"

SET city:ormond\_by\_the\_sea "Volusia"

SET city:ormond\_beach "Volusia"

SET city:osprey "Sarasota"

SET city:otter\_creek "Levy"

SET city:oviedo "Seminole"

SET city:pace "Santa Rosa"

SET city:page\_park "Lee"

SET city:pahokee "Palm Beach"

SET city:paisley "Lake"

SET city:palatka "Putnam"

SET city:palm\_aire "Broward"

SET city:palm\_bay "Brevard"

SET city:palm\_beach "Palm Beach"

SET city:palm\_beach\_gardens "Palm Beach"

SET city:palm\_beach\_shores "Palm Beach"

SET city:palm\_city "Martin"

SET city:palm\_coast "Flagler"

SET city:palm\_harbor "Pinellas"

SET city:palm\_river\_clair\_mel "Hillsborough"

SET city:palm\_shores "Brevard"

SET city:palm\_springs "Palm Beach"

SET city:palm\_springs\_north "Miami-Dade"

SET city:palm\_valley "St Johns"

SET city:palmetto "Manatee"

SET city:palmetto\_estates "Miami-Dade"

SET city:palmona\_park "Lee"

SET city:panama\_city "Bay"  
SET city:panama\_city\_beach "Bay"  
SET city:paradise\_heights "Orange"  
SET city:parker "Bay"  
SET city:parkland "Broward"  
SET city:paxton "Walton"  
SET city:pebble\_creek "Hillsborough"  
SET city:pelican\_bay "Collier"  
SET city:pembroke\_park "Broward"  
SET city:pembroke\_pines "Broward"  
SET city:penney\_farms "Clay"  
SET city:pensacola "Escambia"  
SET city:perry "Taylor"  
SET city:pierson "Volusia"  
SET city:pine\_castle "Orange"  
SET city:pine\_hills "Orange"  
SET city:pine\_island\_center "Lee"  
SET city:pine\_island\_ridge "Broward"  
SET city:pine\_lakes "Lake"  
SET city:pine\_manor "Lee"  
SET city:pine\_ridge "Citrus"  
SET city:pinecrest "Miami-Dade"  
SET city:pineland "Lee"  
SET city:pinellas\_park "Pinellas"  
SET city:pinewood "Miami-Dade"  
SET city:pittman "Lake"  
SET city:placid\_lakes "Highlands"  
SET city:plant\_city "Hillsborough"  
SET city:plantation "Broward"  
SET city:plantation\_island "Collier"  
SET city:plantation\_mobile\_home\_park "Palm Beach"  
SET city:poinciana "Osceola"  
SET city:polk\_city "Polk"  
SET city:pomona\_park "Putnam"  
SET city:pompano\_beach "Broward"  
SET city:pompano\_beach\_highlands "Broward"

SET city:pompano\_estates "Broward"  
SET city:ponce\_de\_leon "Holmes"  
SET city:ponce\_inlet "Volusia"  
SET city:port\_charlotte "Charlotte"  
SET city:port\_la\_belle "Hendry"  
SET city:port\_orange "Volusia"  
SET city:port\_richey "Pasco"  
SET city:port\_salerno "Martin"  
SET city:port\_st\_joe "Gulf"  
SET city:port\_st\_john "Brevard"  
SET city:port\_st\_lucie "St Lucie"  
SET city:pretty\_bayou "Bay"  
SET city:princeton "Miami-Dade"  
SET city:progress\_village "Hillsborough"  
SET city:punta\_gorda "Charlotte"  
SET city:punta\_rassa "Lee"  
SET city:quincy "Gadsden"  
SET city:raiford "Union"  
SET city:ramblewood\_east "Broward"  
SET city:ravenswood\_estates "Broward"  
SET city:redlick "Marion"  
SET city:redington\_beach "Pinellas"  
SET city:redington\_shores "Pinellas"  
SET city:richmond\_heights "Miami-Dade"  
SET city:richmond\_west "Miami-Dade"  
SET city:ridge\_manor "Hernando"  
SET city:ridge\_wood\_heights "Sarasota"  
SET city:ridgecrest "Pinellas"  
SET city:rio "Martin"  
SET city:riverland "Broward"  
SET city:riverview "Hillsborough"  
SET city:riviera\_beach "Palm Beach"  
SET city:rock\_island "Broward"  
SET city:rockledge "Brevard"  
SET city:rolling\_oaks "Broward"  
SET city:roosevelt\_gardens "Broward"



SET city:roseland "Indian River"  
SET city:rotonda "Charlotte"  
SET city:royal\_palm\_beach "Palm Beach"  
SET city:royal\_palm\_estates "Palm Beach"  
SET city:royal\_palm\_ranches "Broward"  
SET city:ruskin "Hillsborough"  
SET city:safety\_harbor "Pinellas"  
SET city:samoset "Manatee"  
SET city:samsula\_spruce\_creek "Volusia"  
SET city:san\_antonio "Pasco"  
SET city:san\_carlos\_park "Lee"  
SET city:sandalfoot\_cove "Palm Beach"  
SET city:sanford "Seminole"  
SET city:sanibel "Lee"  
SET city:sarasota "Sarasota"  
SET city:sarasota\_springs "Sarasota"  
SET city:satellite\_beach "Brevard"  
SET city:sawgrass "St Johns"  
SET city:schall\_circle "Palm Beach"  
SET city:scott\_lake "Miami-Dade"  
SET city:sea\_ranch\_lakes "Broward"  
SET city:sebastian "Indian River"  
SET city:sebring "Highlands"  
SET city:seffner "Hillsborough"  
SET city:seminole "Pinellas"  
SET city:seminole\_manor "Palm Beach"  
SET city:sewall's\_point "Martin"  
SET city:shady\_hills "Pasco"  
SET city:shalimar "Okaloosa"  
SET city:sharpes "Brevard"  
SET city:siesta\_key "Sarasota"  
SET city:silver\_lake "Lake"  
SET city:silver\_springs\_shores "Marion"  
SET city:sky\_lake "Orange"  
SET city:sneads "Jackson"  
SET city:solana "Charlotte"

SET city:sopchoppy "Wakulla"  
SET city:sorrento "Lake"  
SET city:south\_apopka "Orange"  
SET city:south\_bay "Palm Beach"  
SET city:south\_beach "Indian River"  
SET city:south\_bradenton "Manatee"  
SET city:south\_brooksville "Hernando"  
SET city:south\_daytona "Volusia"  
SET city:south\_gate\_ridge "Sarasota"  
SET city:south\_highpoint "Pinellas"  
SET city:south\_miami "Miami-Dade"  
SET city:south\_miami\_heights "Miami-Dade"  
SET city:south\_palm\_beach "Palm Beach"  
SET city:south\_pasadena "Pinellas"  
SET city:south\_patrick\_shores "Brevard"  
SET city:south\_sarasota "Sarasota"  
SET city:south\_venice "Sarasota"  
SET city:southchase "Orange"  
SET city:southeast\_arcadia "DeSoto"  
SET city:southgate "Sarasota"  
SET city:spring\_hill "Hernando"  
SET city:spring\_lake "Hernando"  
SET city:springfield "Bay"  
SET city:st\_augustine "St Johns"  
SET city:st\_augustine\_beach "St Johns"  
SET city:st\_augustine\_shores "St Johns"  
SET city:st\_augustine\_south "St Johns"  
SET city:st\_cloud "Osceola"  
SET city:st\_george "Broward"  
SET city:st\_james\_city "Lee"  
SET city:st\_leo "Pasco"  
SET city:st\_lucie "St Lucie"  
SET city:st\_marks "Wakulla"  
SET city:st\_pete\_beach "Pinellas"  
SET city:st\_petersburg "Pinellas"  
SET city:stacey\_street "Palm Beach"

SET city:starke "Bradford"  
SET city:stock\_island "Monroe"  
SET city:stuart "Martin"  
SET city:sugarmill\_woods "Citrus"  
SET city:suncoast\_estates "Lee"  
SET city:sunny\_isles\_beach "Miami-Dade"  
SET city:sunrise "Broward"  
SET city:sunset "Miami-Dade"  
SET city:sunshine\_acres "Broward"  
SET city:sunshine\_ranches "Broward"  
SET city:surfside "Miami-Dade"  
SET city:sweetwater "Miami-Dade"  
SET city:sylvan\_shores "Highlands"  
SET city:taft "Orange"  
SET city:tallahassee "Leon"  
SET city:tamarac "Broward"  
SET city:tamiami "Miami-Dade"  
SET city:tampa "Hillsborough"  
SET city:tangelo\_park "Orange"  
SET city:tangerine "Orange"  
SET city:tarpon\_springs "Pinellas"  
SET city:tavares "Lake"  
SET city:tavernier "Monroe"  
SET city:taylor\_creek "Okeechobee"  
SET city:tedder "Broward"  
SET city:temple\_terrace "Hillsborough"  
SET city:tequesta "Palm Beach"  
SET city:terra\_mar "Broward"  
SET city:the\_crossings "Miami-Dade"  
SET city:the\_hammocks "Miami-Dade"  
SET city:the\_meadows "Sarasota"  
SET city:the\_villages "Sumter"  
SET city:thonotosassa "Hillsborough"  
SET city:three\_lakes "Miami-Dade"  
SET city:three\_oaks "Lee"  
SET city:tice "Lee"

SET city:tierra\_verde "Pinellas"  
SET city:tildenville "Orange"  
SET city:timber\_pines "Hernando"  
SET city:titusville "Brevard"  
SET city:town\_'n'\_country "Hillsborough"  
SET city:treasure\_island "Pinellas"  
SET city:trenton "Gilchrist"  
SET city:trinity "Pasco"  
SET city:twin\_lakes "Broward"  
SET city:tyndall\_afb "Bay"  
SET city:umatilla "Lake"  
SET city:union\_park "Orange"  
SET city:university "Hillsborough"  
SET city:university\_park "Miami-Dade"  
SET city:upper\_grand\_lagoon "Bay"  
SET city:utopia "Broward"  
SET city:valparaiso "Okaloosa"  
SET city:valrico "Hillsborough"  
SET city:vamo "Sarasota"  
SET city:venice "Sarasota"  
SET city:venice\_gardens "Sarasota"  
SET city:vernon "Washington"  
SET city:vero\_beach "Indian River"  
SET city:vero\_beach\_south "Indian River"  
SET city:village\_park "Broward"  
SET city:villages\_of\_oriole "Palm Beach"  
SET city:villano\_beach "St Johns"  
SET city:villas "Lee"  
SET city:vineyards "Collier"  
SET city:virginia\_gardens "Miami-Dade"  
SET city:wabasso "Indian River"  
SET city:wabasso\_beach "Indian River"  
SET city:wahneta "Polk"  
SET city:waldo "Alachua"  
SET city:warm\_mineral\_springs "Sarasota"  
SET city:warrington "Escambia"

SET city:washington\_park "Broward"  
SET city:watertown "Columbia"  
SET city:wauchula "Hardee"  
SET city:wausau "Washington"  
SET city:waverly "Polk"  
SET city:webster "Sumter"  
SET city:wedgefield "Orange"  
SET city:weeki\_wachee "Hernando"  
SET city:weeki\_wachee\_gardens "Hernando"  
SET city:wekiwa\_springs "Seminole"  
SET city:welaka "Putnam"  
SET city:wellington "Palm Beach"  
SET city:wesley\_chapel "Pasco"  
SET city:wesley\_chapel\_south "Pasco"  
SET city:west\_and\_east\_lealman "Pinellas"  
SET city:west\_bradenton "Manatee"  
SET city:west\_de\_land "Volusia"  
SET city:west\_ken\_lark "Broward"  
SET city:west\_little\_river "Miami-Dade"  
SET city:west\_melbourne "Brevard"  
SET city:west\_miami "Miami-Dade"  
SET city:west\_palm\_beach "Palm Beach"  
SET city:west\_pensacola "Escambia"  
SET city:west\_perrine "Miami-Dade"  
SET city:west\_samoset "Manatee"  
SET city:west\_vero\_corridor "Indian River"  
SET city:westchase "Hillsborough"  
SET city:westchester "Miami-Dade"  
SET city:westgate\_belvedere\_homes "Palm Beach"  
SET city:weston "Broward"  
SET city:westview "Miami-Dade"  
SET city:westville "Holmes"  
SET city:westwood\_lakes "Miami-Dade"  
SET city:wewahitchka "Gulf"  
SET city:whiskey\_creek "Lee"  
SET city:whisper\_walk "Palm Beach"

SET city:white\_city "St Lucie"  
SET city:white\_springs "Hamilton"  
SET city:whitfield "Manatee"  
SET city:wildwood "Sumter"  
SET city:williamsburg "Orange"  
SET city:williston "Levy"  
SET city:williston\_highlands "Levy"  
SET city:willow\_oak "Polk"  
SET city:wilton\_manors "Broward"  
SET city:wimauma "Hillsborough"  
SET city:windermere "Orange"  
SET city:winston "Polk"  
SET city:winter\_beach "Indian River"  
SET city:winter\_garden "Orange"  
SET city:winter\_haven "Polk"  
SET city:winter\_park "Orange"  
SET city:winter\_springs "Seminole"  
SET city:woodville "Leon"  
SET city:worthington\_springs "Union"  
SET city:wright "Okaloosa"  
SET city:yalaha "Lake"  
SET city:yankeetown "Levy"  
SET city:yulee "Nassau"  
SET city:zellwood "Orange"  
SET city:zephyrhills "Pasco"  
SET city:zephyrhills\_north "Pasco"  
SET city:zephyrhills\_south "Pasco"  
SET city:zephyrhills\_west "Pasco"  
SET city:zolfo\_springs "Hardee"

## References

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<sup>i</sup> Differences between Directory Services and Databases. Tech Direct Archive. (2019, December 18). Retrieved November 19, 2021, from <https://techdirectarchive.com/2019/12/18/differences-between-directory-services-and-databases/>.

<sup>ii</sup> A Brief History of Microsoft's Active Directory. AJS Networking. (2017, March 8). Retrieved November 19, 2021, from <https://www.ajsnetworking.com/microsofts-active-directory/>.

<sup>iii</sup> Hannifin, D., Alpern, N. J., & Alpern, J. (2010). Active Directory. Science Direct. Retrieved November 19, 2021, from <https://www.sciencedirect.com/science/article/pii/B9781597495783000049>.

<sup>iv</sup> Creating Microsoft Access Contact Management Database. Software Matters. (n.d.). Retrieved November 19, 2021, from <https://www.software-matters.co.uk/creating-ms-access-contact-management-database.html>.