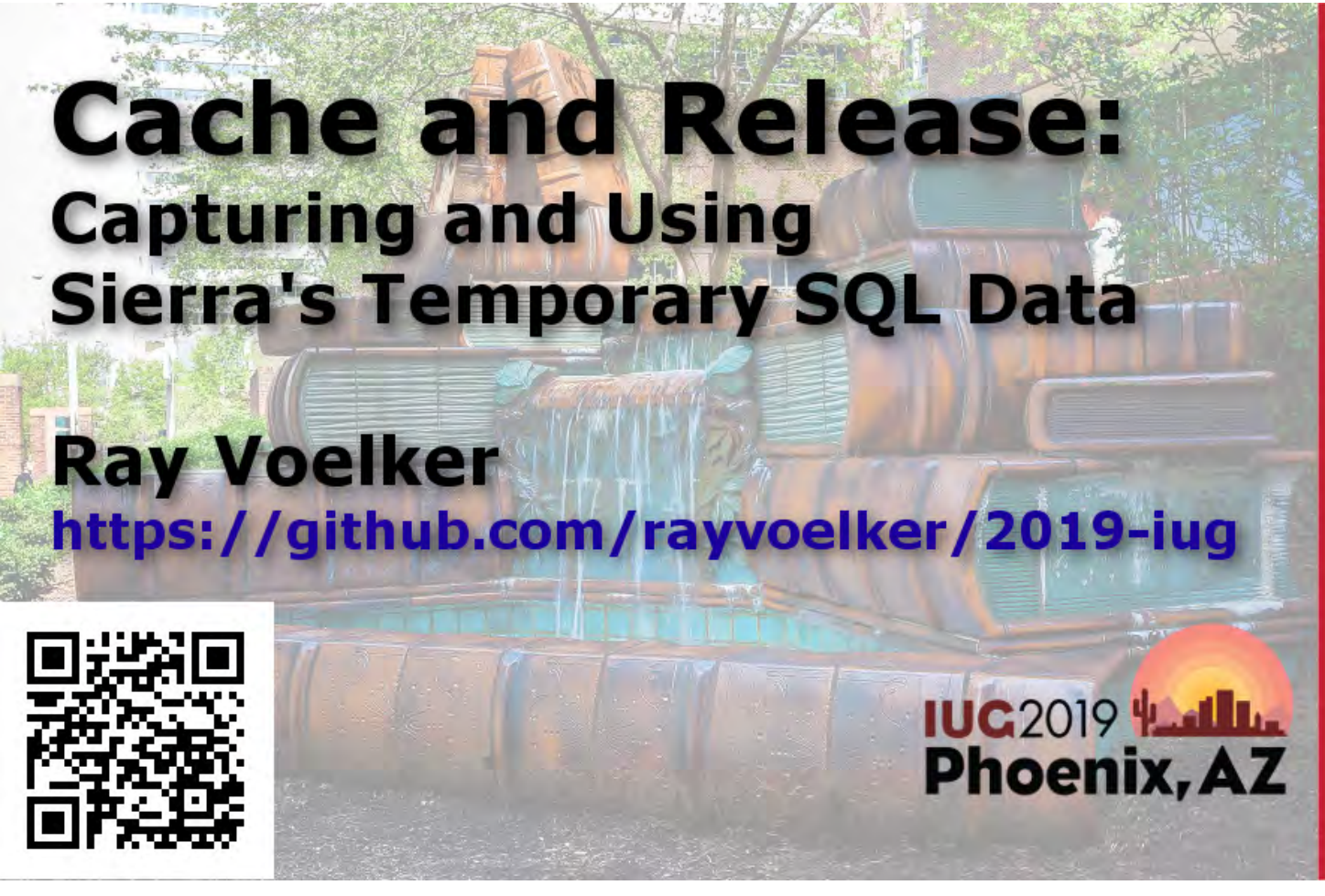


Cache and Release:
Capturing and Using Sierra's Temporary SQL Data

Ray Voelker

https://github.com/rayvoelker/2019-iug

IUG2019 Phoenix, AZ

THE PUBLIC LIBRARY of Cincinnati and Hamilton County

QUICK BACKGROUND

- Sierra's Direct SQL Access feature allows us to:
  - Quickly and efficiently target and extract real-time data from the Sierra ILS.
  - Organize data in logical and useful ways

QUICK BACKGROUND (CONT.)

- Why save / preserve data from Sierra?
  1. Data transformations and integrations for specific use cases
     wikipedia.org/wiki/Data_transformation
     wikipedia.org/wiki/Data_integration
     - For example, adding geocoding information to patron address data:
       wikipedia.org/wiki/Geocoding

QUICK BACKGROUND (CONT.)

- Why save / preserve data from Sierra? (cont.)
  2. Cache Sierra data:
     - For use in an application instead of running an "expensive query" to deliver content
     - For use in an application where holding onto data that may otherwise be destroyed or transformed by the Sierra application itself

UNDERSTANDING SIERRA'S DATABASE VIEWS AND DATA

- Some data in sierra stays more static (think of a "receipt", or log of transactions)

circ_trans

Each row of circ_trans contains information about a circulation transaction.

Column	Data Type	Not NULL?	Comment
id	int	false	System-generated sequential ID.
transaction_gmt	timestamptz	false	Transaction date in UNIX format.
application_name	varchar	false	The name of the program that generated the transaction. Valid program names are: • circ (includes transactions made using PC Circ) • circa (for transactions written by selfcheckwebserver and in-house use [transaction codes 'u' and 's'], which use webpac to execute transactions.) • milcirc • milmyselfcheck • readreq • selfcheck
source_code	varchar	false	The transaction source. Possible values are: • local • INN-Reach • ILL
op_code	varchar	false	Type of transaction:

circ_trans

Each row of circ_trans contains information about a circulation transaction.

Column	Data Type	Not NULL?	Comment
id	int	false	System-generated sequential ID.
transaction_gmt	timestamptz	false	Transaction date in UNIX format.
application_name	varchar	false	The name of the program that generated the transaction. Valid program names are: • circ (includes transactions made using PC Circ) • circa (for transactions written by selfcheckwebserver and in-house use [transa • milcirc • milmyselfcheck • readreq • selfcheck
source_code	varchar	false	The transaction source. Possible values are: • local • INN-Reach • ILL
op_code	varchar	false	Type of transaction: o = checkout — i = checkin n = hold, nb = bib hold, ni = item hold, nv = volume hold — h = hold with r, hb = hold reca, hi = hold reca, hv = hold reca f = filled hold — r = renewal b = booking — u = use count
patron_record_id	bigint	false	Foreign key to patron_record.
item_record_id	bigint	false	Foreign key to item_record.

UNDERSTANDING SIERRA'S DATABASE VIEWS AND DATA (CONT.)

- Circulation transactions are created in the database table and remain static
- Rows are deleted from the table after a certain period of time (2 weeks is the default, but this can be extended by iii upon request)

```
-- get some info about our circ_trans dates
SELECT
NOW()::TIMESTAMP WITH TIME ZONE as now_gmt,
MAX(c.transaction_gmt)::TIMESTAMP WITH TIME ZONE AS max,
MIN(c.transaction_gmt)::TIMESTAMP WITH TIME ZONE AS min,
AGE(MIN(c.transaction_gmt)) AS earliest_transaction_age

FROM
sierra_view.circ_trans as c
```

	now_gmt timestamp with time zone	max_circ_gmt timestamp with time zone	min_circ_gmt timestamp with time zone	earliest_transaction_age interval
1	2019-04-10 08:37:03.856585-04	2019-04-10 08:36:38-04	2019-03-26 21:43:24-04	14 days 02:16:36

UNDERSTANDING SIERRA'S DATABASE VIEWS AND DATA (CONT.)

- Other data is more variable or is a direct representation that describes a particular state of a record or process in the ILS.

hold

Each row of hold describes a bibliographic, item, or volume hold.

Column	Data Type	Not NULL?	Comment
id	bigint	false	System-generated sequential ID.
patron_record_id	bigint	false	Foreign key to patron_record.
record_id	bigint	false	Foreign key to record.
placed_gmt	timestamp	false	Date the hold was placed.
is_frozen	boolean	false	Specifies whether the hold is frozen (suspended).
delay_days	int	false	Stores the "not wanted before" date as a number of days after the date the hold was placed. The maximum value is "180". If a "not wanted before" date was not specified, the value is '0'.
location_code	varchar	false	For bib or volume-level holds, the branch location from which to fill the hold, if the hold is set for 'Limit to Location'. Does not apply to item-level holds (blank).
expires_gmt	timestamp	false	"Not needed after" date.
status	char	false	Hold status.

hold

Each row of hold describes a bibliographic, item, or volume hold.

Column	Data Type	Not NULL?	Comment
id	bigint	false	System-generated sequential ID.
patron_record_id	bigint	false	Foreign key to patron_record.
record_id	bigint	false	Foreign key to record.
placed_gmt	timestamp	false	Date the hold was placed.
is_frozen	boolean	false	Specifies whether the hold is frozen (suspended).
delay_days	int	false	Stores the "not wanted before" date as a number of days after the date the hold was specified, the value is '0'.
location_code	varchar	false	For bib or volume-level holds, the branch location from which to fill the hold, if the ho
expires_gmt	timestamp	false	"Not needed after" date.
status	char	false	Hold status. CODE 0 b j i t
is_ir	boolean	false	Specifies whether the hold is an INN-Reach hold.
pickup_location_code	varchar	false	Pickup location code.

UNDERSTANDING SIERRA'S DATABASE VIEWS AND DATA (CONT.)

- The state of the hold is defined in the Sierra database
- Data changes depending on the state or status of the hold, and is then removed from the database when the hold is deleted, filled or expires

```
-- this will select Ray Voelker's hold information from the
-- Sierra SQL database
SELECT
h.id,
h.patron_record_id,
h.record_id,
h.status,
h.pickup_location_code

FROM
sierra_view.hold as h

WHERE
h.patron_record_id = 481038535591;
```

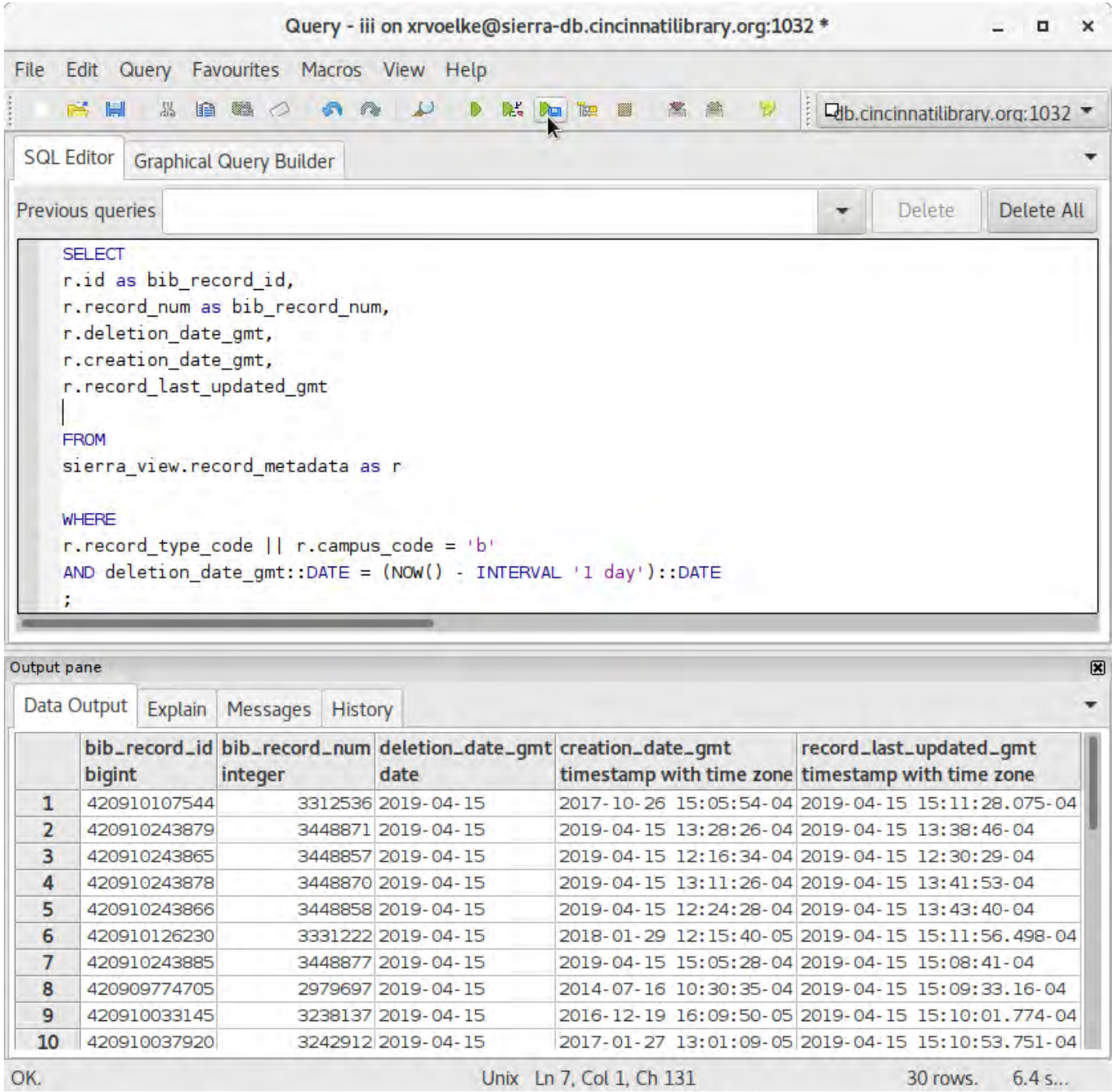
	id bigint	patron_record_id bigint	record_id bigint	status character(1)	pickup_location_code character varying(5)
1	37661683	481038535591	450975488540	b	1
2	37332240	481038535591	420910217875	0	1

I checkout the item, and the hold data goes away after a second query.

	id bigint	patron_record_id bigint	record_id bigint	status character(1)	pickup_location_code character varying(5)
1	37332240	481038535591	420910217875	0	1

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA?

- No shortage of options!
  - pgAdmin is a popular choice for a desktop client
    www.pgadmin.org
  - "Execute query, write result to file"
    Creates a .csv file from the results


Query - iii on xrvoelke@sierra-db.cincinnatilibrary.org:1032 *
File Edit Query Favourites Macros View Help
db.cincinnatilibrary.org:1032
SQL Editor
Graphical Query Builder
Previous queries
Delete
Delete All
SELECT
r.id as bib_record_id,
r.record_num as bib_record_num,
r.deletion_date_gmt,
r.creation_date_gmt,
r.record_last_updated_gmt
FROM
sierra_view.record_metadata as r
WHERE
r.record_type_code || r.campus_code = 'b'
AND deletion_date_gmt::DATE = (NOW() - INTERVAL '1 day')::DATE
;
Output pane
Data Output
Explain
Messages
History
bib_record_id bigint
bib_record_num integer
deletion_date_gmt date
creation_date_gmt timestamp with time zone
record_last_updated_gmt timestamp with time zone
1 420910107544 3312536 2019-04-15 2017-10-26 15:05:54-04 2019-04-15 15:11:28.075-04
2 420910243879 3448871 2019-04-15 2019-04-15 13:28:26-04 2019-04-15 13:38:46-04
3 420910243865 3448857 2019-04-15 2019-04-15 12:16:34-04 2019-04-15 12:30:29-04
4 420910243878 3448870 2019-04-15 2019-04-15 13:11:26-04 2019-04-15 13:41:53-04
5 420910243866 3448858 2019-04-15 2019-04-15 12:24:28-04 2019-04-15 13:43:40-04
6 420910126230 3331222 2019-04-15 2018-01-29 12:15:40-05 2019-04-15 15:11:56.498-04
7 420910243885 3448877 2019-04-15 2019-04-15 15:05:28-04 2019-04-15 15:08:41-04
8 420909774705 2979697 2019-04-15 2014-07-16 10:30:35-04 2019-04-15 15:09:33.16-04
9 420910033145 3238137 2019-04-15 2016-12-19 16:09:50-05 2019-04-15 15:10:01.774-04
10 420910037920 3242912 2019-04-15 2017-01-27 13:01:09-05 2019-04-15 15:10:53.751-04
OK.
Unix Ln 7, Col 1, Ch 131
30 rows. 6.4 s...

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA? (CONT.)

- Many programming languages provide access to PostgreSQL via their libraries:
  - php-pgsql: PHP PostgreSQL driver
    www.php.net/manual/en/book.pgsql.php
  - psycopg2: Python PostgreSQL adapter
    initd.org/psycopg/docs/

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA? (CONT.)

- My method consists of the following overview:
  1. Use Python to connect to Sierra’s database
  2. Issue SQL statement on Sierra's database to target and compile the data for extraction

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA? (CONT.)

- My method consists of the following overview (cont.):
  3. Export result data to either a .csv file, and/or directly into a SQLite database
     - .csv files are easy to later load into an SQLite database, spreadsheet, or other data warehouse tool

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA? (CONT.)

SQLite Database: sqlite.org

"SQLite is a C-language library that implements a small, fast, self-contained, high-reliability, full-featured, SQL database engine."

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA? (CONT.)

SQLite Database (cont.)

- SQLite database engine is a great tool for caching data:
  1. Stores and organizes large amounts of data quickly and efficiently
  2. You don’t have to set up and maintain a server (data is portable; entire database is contained in a single, cross-platform file)

HOW TO CACHE / TRANSFORM / PRESERVE DATA FROM SIERRA? (CONT.)

SQLite Database (cont.)

3. Ability and flexibility to build SQL queries and applications that directly use the data that you've collected
4. Has a useful desktop tool: sqlitebrowser.org
5. It's included in the Python Standard Library!

```
# Python sample code to create database,
# create a table, and then insert some data
# note: sqlite3 is part of the Python Standard Library
import sqlite3

# create the database
conn = sqlite3.connect('example.db')
cursor = conn.cursor()

# create the table
cursor.execute("""CREATE TABLE IF NOT EXISTS `data`
        ( `id` INTEGER PRIMARY KEY AUTOINCREMENT,
        `input` TEXT )""")

# insert some data
cursor.execute("""INSERT INTO data (`input`)
        VALUES ('sample text')""")

# commit and close the connection
conn.commit()
conn.close()
```

EXAMPLES:

1. **Collection Analysis / Circulation Data Analysis**
   - intended for use with the CollectionHQ service, but can be adapted for local use
2. **Patron Savings Calculator**
   - intended to display information on the Encore patron account information page about how much money has been "saved" by using the library

EXAMPLES: (CONT.)

3. **Hold Shelf Delivery Matrix Report**
   - intended to produce a spreadsheet report of items for hold shelf locations (ready for patron pickup) and from where they originated
4. **Mapping Geo Data from Patron Address Data and Circulation Transaction Data**
   - intended to take geocoded patron address data and produce a visualization by plotting it on a map

EXAMPLE 1

COLLECTION ANALYSIS / CIRCULATION DATA ANALYSIS

- github.com/plch/collection-analysis
- This application was built for the purpose of automatically preserving and sending data from the Sierra database to the CollectionHQ service via FTP

COLLECTION ANALYSIS / CIRCULATION DATA ANALYSIS (CONT.)

- Three main groups of data are targeted for export:
  1. Bibliographic Record Data:
     temp_table-bib_data.sql
     Fields exported include: bib record number, control numbers (var fields tagged 'o'), isbn, call numbers, and a few other metadata fields related to the bib record

COLLECTION ANALYSIS / CIRCULATION DATA ANALYSIS (CONT.)

- Three main groups of data are targeted for export: (cont.)
  2. Item Record Data:
     temp_table-item_data.sql
     Fields exported include: item record number, bib record number, circulation information, price, and a few other metadata fields related to the item record

COLLECTION ANALYSIS / CIRCULATION DATA ANALYSIS (CONT.)

- Three main groups of data are targeted for export: (cont.)
  3. Hold Data:
     temp_table-hold_data.sql
     Weekly snapshot of bib-level holds. It is organized by title (bib record number), and then each title has a list of holds with related metadata for each hold (patron number, pickup location, created date, expiration date, etc)

COLLECTION ANALYSIS / CIRCULATION DATA ANALYSIS (CONT.)

- Overview of the process:
  1. Create and open .csv files to hold data output and/or open local database (if it's useful to place data into local SQLite database)
  2. Connect to remote Sierra database, and create the temporary tables that will be used for exporting

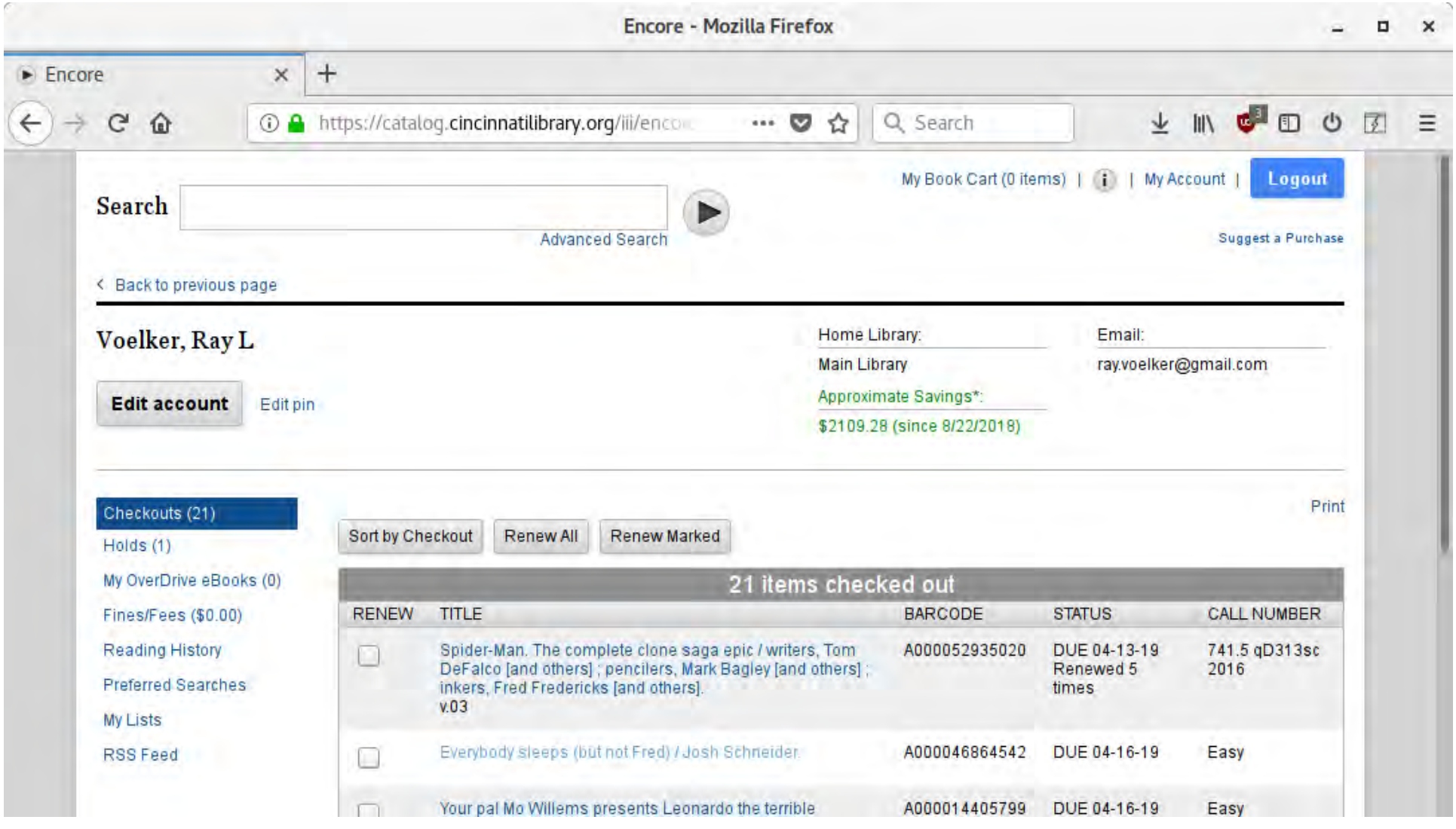
COLLECTION ANALYSIS / CIRCULATION DATA ANALYSIS (CONT.)

- Overview of the process (cont.):
  3. Generate data output from the Sierra database temporary tables, and write the output to a .csv file and/or to a local SQLite database
  4. Send data via FTP
- full export script can be found in the public github repository for this project

EXAMPLE 2

PATRON SAVINGS CALCULATOR

- github.com/plch/patron-savings-calculator
- This application was designed to work with the iii discovery layer Encore's account detail page, to display how much a patron has "saved" by borrowing from the library


Encore - Mozilla Firefox
Encore
https://catalog.cincinnatilibrary.org/iii/encore
Search
My Book Cart (0 items) | | My Account | Logout
Search
Advanced Search
Suggest a Purchase
Back to previous page
Voelker, Ray L
Home Library:
Main Library
Email:
ray.voelker@gmail.com
Approximate Savings*:
$2109.28 (since 8/22/2018)
Edit account
Edit pin
Checkouts (21)
Holds (1)
My OverDrive eBooks (0)
Fines/Fees ($0.00)
Reading History
Preferred Searches
My Lists
RSS Feed
Print
Sort by Checkout
Renew All
Renew Marked
21 items checked out
RENEW
TITLE
BARCODE
STATUS
CALL NUMBER
Spider-Man. The complete clone saga epic / writers, Tom DeFalco [and others] ; pencilers, Mark Bagley [and others] ; inkers, Fred Fredericks [and others]. v.03
A000052935020
DUE 04-13-19 Renewed 5 times
741.5 qD313sc 2016
Everybody sleeps (but not Fred) / Josh Schneider
A000046864542
DUE 04-16-19
Easy
Your pal Mo Willems presents Leonardo the terrible
A000014405799
DUE 04-16-19
Easy

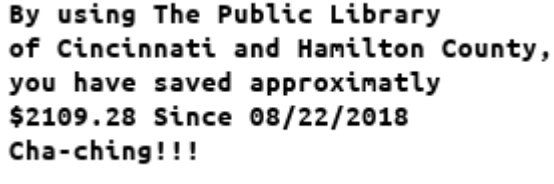
PATRON SAVINGS CALCULATOR (CONT.)

- Cached “savings” information is based on the patron record number and can be output in multiple formats (based on this application's custom URL endpoints):
  - JSON
    /api/v1/patron_savings/2198439


```
{
        "count_titles": 118,
        "min_date_epoch": 1534957500,
        "patron_record_num": 2198439,
        "total_savings": 2109.2799999999997
}
```

PATRON SAVINGS CALCULATOR (CONT.)

- Cached “savings” information is based on the patron record number and can be output in multiple formats (based on this application's custom URL endpoints):
  - PNG
    /api/v1/patron_savings/img/2198439



PATRON SAVINGS CALCULATOR (CONT.)

- About this very simple RESTful API
  - Written as a Python / Flask application:
    - github.com/plch/patron-savings-calculator/blob/master/app.py
    - www.palletsprojects.com/p/flask

PATRON SAVINGS CALCULATOR (CONT.)

- About this very simple RESTful API (cont)
  - Hosted on an Apache Web Server via the WSGI module
  - A good tutorial on how this can be set up can be found here: www.digitalocean.com/community/tutorials/how-to-deploy-a-flask-application-on-an-ubuntu-vps

PATRON SAVINGS CALCULATOR (CONT.)

- About this very simple RESTful API (cont)
  - Draws data from the SQLite database that has been caching relevant data
  - SQLite database, `patron_savings.db` is updated frequently (every 5 minutes) via a Python update script: github.com/plch/patron-savings-calculator/blob/master/update.py

PATRON SAVINGS CALCULATOR (CONT.)

About the `update.py` script :

- Script starts by looking at the last entry it received from the Sierra database
- A query is constructed to extract relevant data from the Sierra database that is more recent than that last entry in the local database
- The local database is updated with the fresh data from the Sierra database

PATRON SAVINGS CALCULATOR (CONT.)

A note about privacy / protection / obfuscation of this data:

- No title information is saved in the local database, other than a hashed bib record id
- Hashed bib record id is stored to avoid duplicating the price information when a title is checked out multiple times, and to differentiate titles from one another in the local database

PATRON SAVINGS CALCULATOR (CONT.)

A note about obfuscation with this data (cont.):

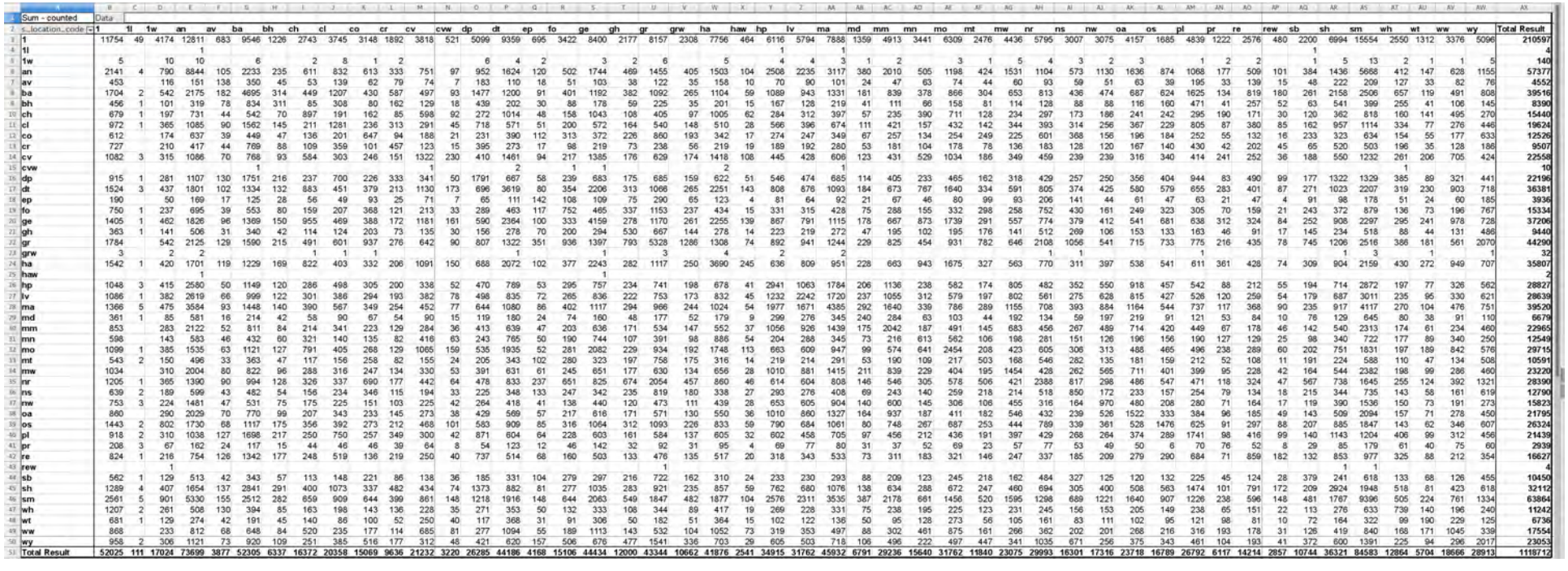
- No patron information, other than the patron record number, is stored in the local database
- Only price and number of titles checked out are surfaced via the RESTful API

EXAMPLE 3

HOLD SHELF DELIVERY MATRIX REPORT

- github.com/plch/plch-holds-shelf
- The purpose of this application is to create a spreadsheet that displays items delivered to a hold shelf location, and from what location they came from

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)



| Sum - counted | Data | | |

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

SELECT FROM `**sierra_view.hold**` WHERE `**status**` =

code	definition
"b"	Bib hold ready for pickup
"j"	Volume hold ready for pickup
"i"	Item hold ready for pickup

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Source location:
  - `checkin_statistics_group_code_num` found in `sierra_view.item_record` table view

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Destination location:
  - `pickup_location_code` found in `sierra_view.hold`

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Note: the source value of `location_code` comes from `sierra_view.statistic_group_myuser` using `checkin_statistics_group_code_num` effectively giving us the pickup location from the stat group code num

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Do not insert duplicate rows of hold data...
  - We could build a complicated set of comparisons of the remotely selected data to our local data ...
  - Or, we could let the databases do all the work!
  - Create a hash of the entire hold row, use that value as the unique primary key in the local database table

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

Local SQLite table creation (simplified)

```
--  local SQLite table creation (simplified) ...
CREATE TABLE IF NOT EXISTS "data" (
        `hash_row` TEXT UNIQUE PRIMARY KEY
        -- more columns created below ...
);
```

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

Remote Sierra database query (simplified)

```
-- remote Sierra database query (simplified) ...
SELECT
MD5(CAST((h.*) AS TEXT)) AS hash_row
-- more columns of data selected below
FROM
sierra_view.hold AS h
WHERE
h.status IN(
        'b', 'j', 'i'
);
```

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

Remote Sierra database query (simplified) output:

	hash_row text
1	59752190f26bda0ec17167010cc6619f
2	ce971535718d416fd09e9266797c9374
3	d190eedbd12bdb434f6eaf8fdaa9c2a5
4	dc2befd5f6c9e356ef4f7d0885775a55
5	21915024b2b26de216edd6f6a9fc572a
6	[illegible]

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

Local SQLite table inserting the retrieved data (simplified):

```
INSERT OR IGNORE INTO data (
        hash_row
)
VALUES ('59752190f26bda0ec17167010cc6619f'),
       ('59752190f26bda0ec17167010cc6619f'),
       ('ce971535718d416fd09e9266797c9374');

SELECT * FROM DATA;
```

	hash_row
1	59752190f26bda0ec17167010cc6619f
2	ce971535718d416fd09e9266797c9374

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Overview of the process: (this should look familiar)
  1. Connect to our local database, and create table if it doesn't exist. Also, establish connection to the remote Sierra database
  2. Query the Sierra 'hold' table for rows that have status of 'i', 'j', or 'b'; this indicates that there is a item hold, volume hold, or bib hold ready for pickup

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Overview of the process: (cont.)
  3. Insert retrieved rows (or ignore duplicate rows as explained previously) to the local SQLite database, then close all connections
  4. Set the update of local data to happen frequently (every 5 minutes via CRON is a good method for doing this)

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

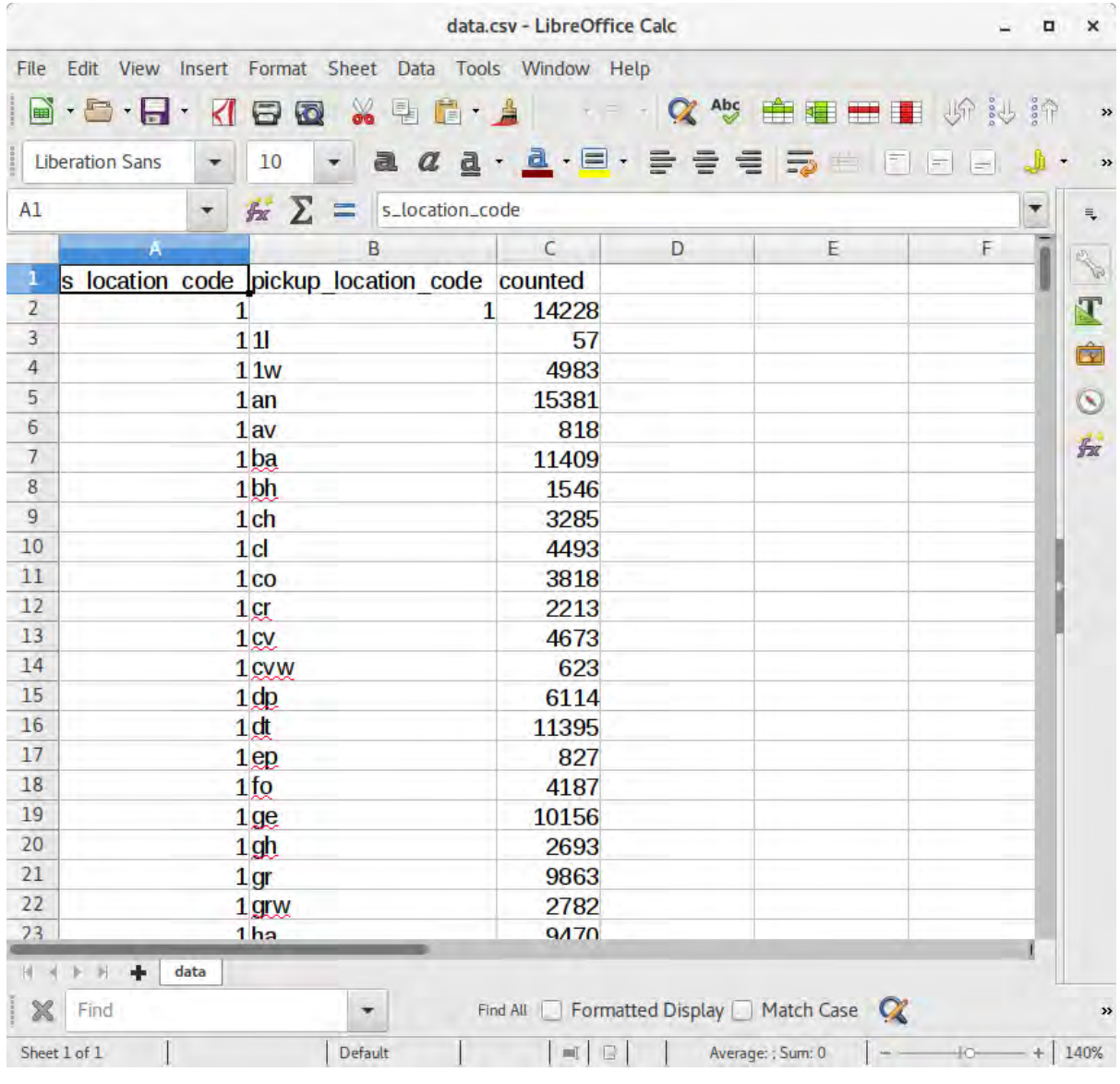
- Exporting / Producing the report
  1. Query the local SQLite database, then export the results to a .csv file:
     github.com/plch/plch-holds-shelf/blob/master/export_csv.sh
     github.com/plch/plch-holds-shelf/blob/master/export.sql

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Exporting / Producing the report (cont.)
  2. Import the .csv file into LibreOffice Calc (or Excel) and perform a pivot on the data:

HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

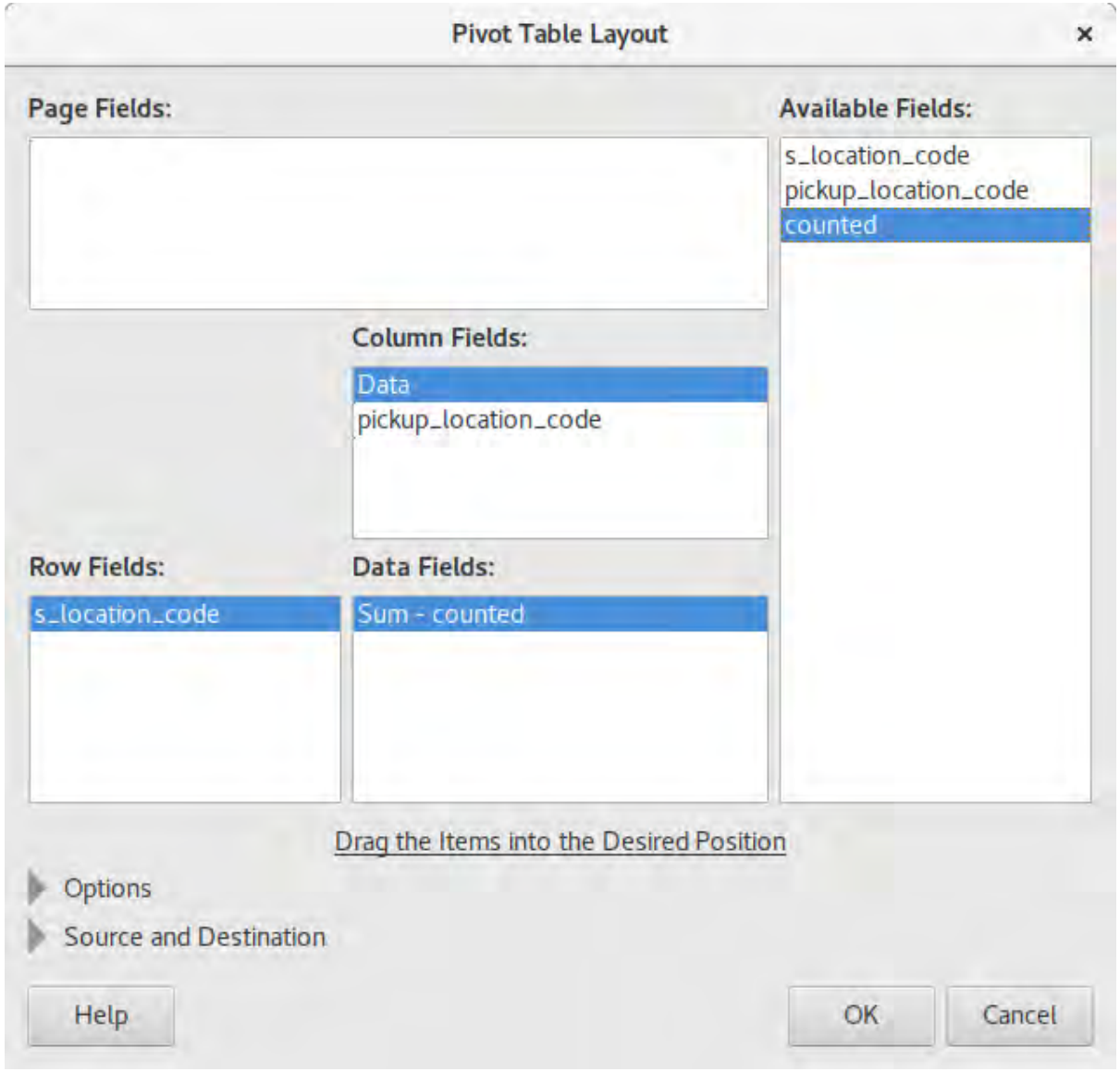
- Exporting / Producing the report (cont.)



s_location_code	pickup_location_code	counted
1	1	14228
1	1l	57
1	1w	4983
1	an	15381
1	av	818
1	ba	11409
1	bh	1546
1	ch	3285
1	cl	4493
1	co	3818
1	cr	2213
1	cv	4673
1	cvw	623
1	dp	6114
1	dt	11395
1	ep	827
1	fo	4187
1	ge	10156
1	gh	2693
1	gr	9863
1	grw	2782
1	ha	9470

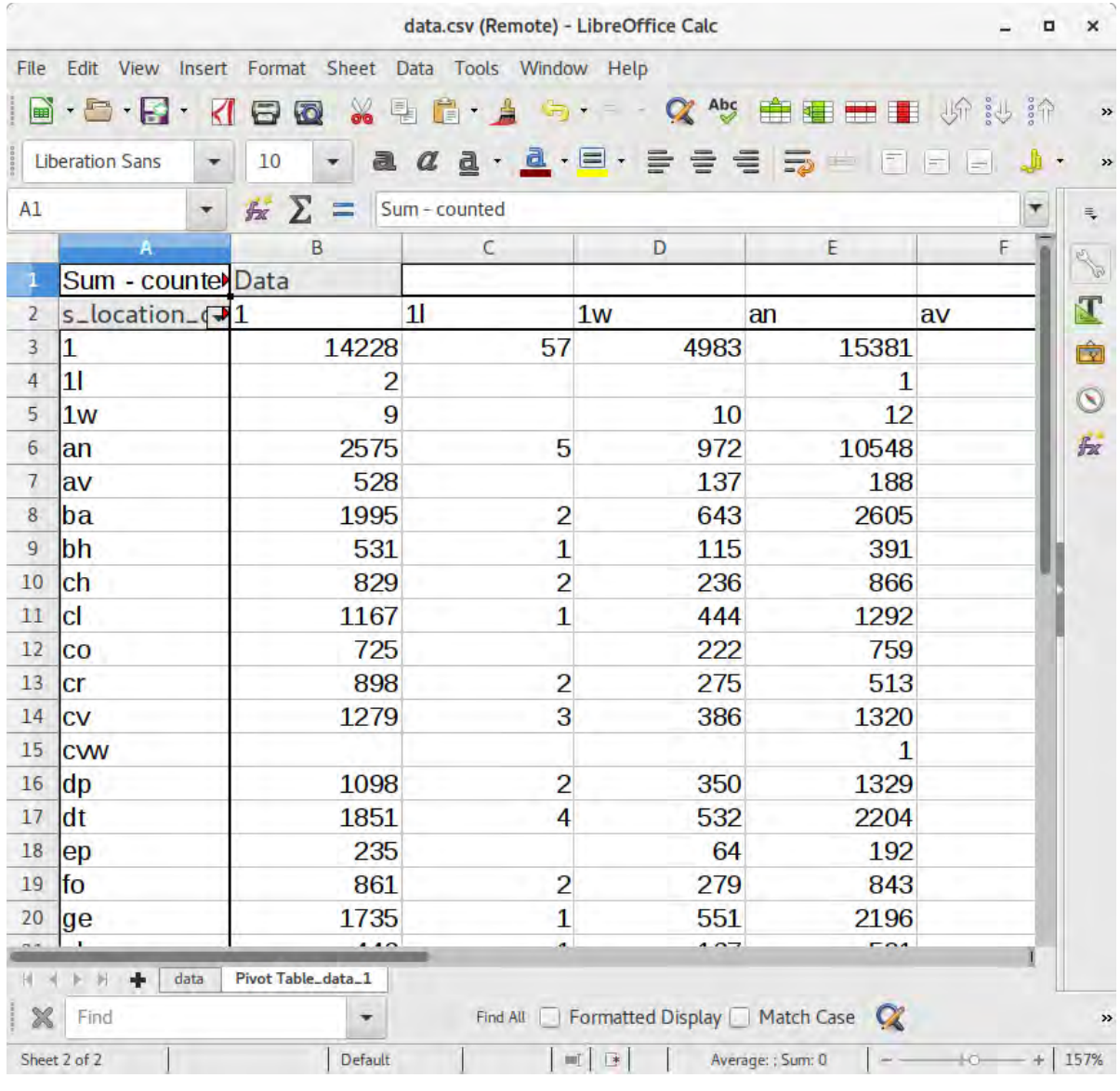
HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Exporting / Producing the report (cont.)



HOLD SHELF DELIVERY MATRIX REPORT (CONT.)

- Exporting / Producing the report (cont.)

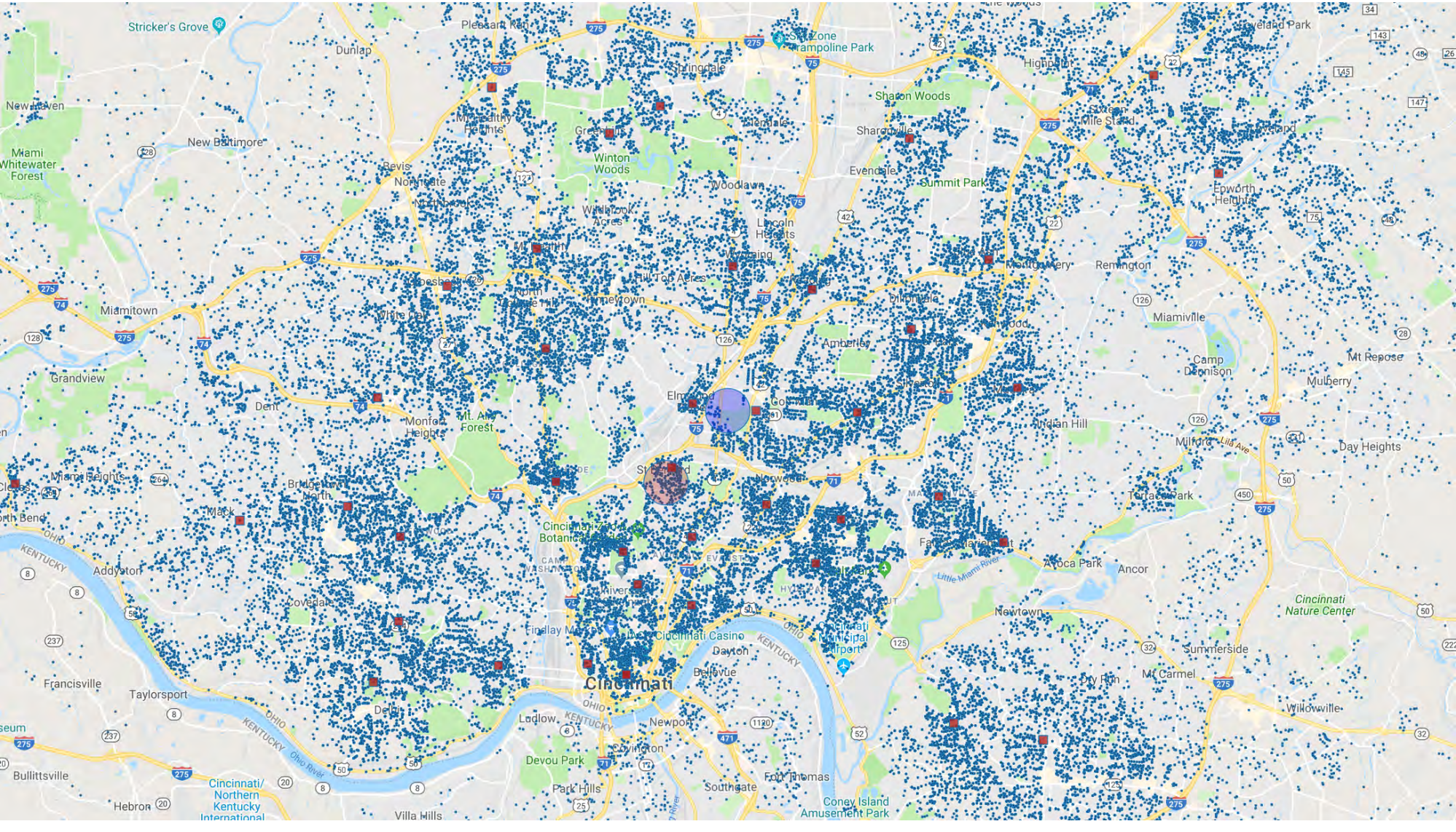


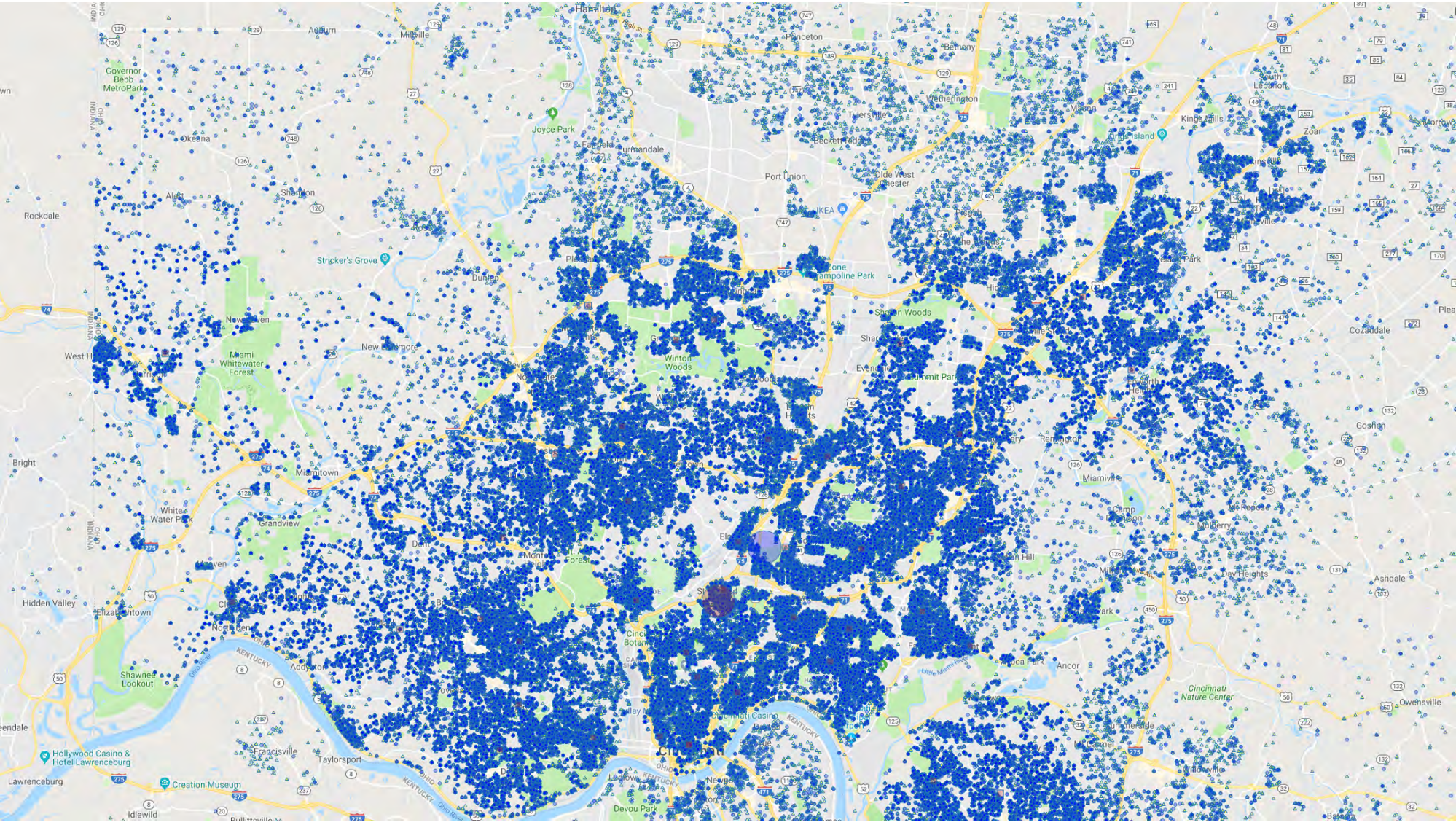
2019-04-15_hold_shelf_matrix.xlsx

EXAMPLE 4

MAPPING GEO DATA FROM PATRON ADDRESS DATA AND CIRCULATION TRANSACTION DATA

- The purpose of this process is to plot patron locations and branch locations on a map based on latitude / longitude coordinates derived from mailing address data
- This is a work in progress!


Stricker's Grove
Dunlap
Pleasant Run
Springdale
Sky Zone Trampoline Park
Highpoint
Sharon Woods
Sharonville
Evendale
Summit Park
Miami Whitewater Forest
New Baltimore
Winton Woods
Woodlawn
Lincoln Heights
Wyoming
Hill Top Acres
Kenwood
Montgomery
Remington
Miamitown
Grandview
Dent
Monfort Heights
Mt. Airy Forest
Elmwood
Amberley
Silverton
Indian Hill
Miamiville
Camp Dennison
Mt Repose
Mulberry
Milford
Day Heights
Miami Heights
Bridgetown North
Mack
Norwood
Terrace Park
Addyston
Covedale
Cincinnati Zoo Botanical Garden
Avoca Park
Ancor
Newtown
Cincinnati Nature Center
Summerside
Mt Carmel
Dry Run
Willowville
Francisville
Taylorsport
Delhi
Cincinnati
Ludlow
Newport
Covington
Devou Park
Park Hills
Southgate
Fort Thomas
Coney Island Amusement Park
Bullittsville
Hebron
Villa Hills
Cincinnati/ Northern Kentucky International
Cincinnati Municipal Airport
Cincinnati Casino
Dayton
Bellevue
Findlay Market
Little Miami River
Ohio River
OHIO
KENTUCKY


Hamilton
Princeton
Bethany
Wetherington
Tylersville
Beckett Ridge
Port Union
Olde West Chester
Joyce Park
Turmandale
Fairfield
Auburn
Mitville
Governor Bebb MetroPark
Okeena
Sharpton
Alert
Rockdale
Stricker's Grove
Dunlap
Pleasant Ridge
Zone Trampoline Park
Sharon Woods
Evendale
Summit Park
Winton Woods
Miami Whitewater Forest
New Baltimore
Miamitown
Grandview
White Water Park
Bright
Hidden Valley
Elizabethtown
Shawnee Lookout
Addyston
Francisville
Taylorsport
Hollywood Casino & Hotel Lawrenceburg
Lawrenceburg
Creation Museum
Idlewild
Devou Park
Ludlow
Cincinnati Casino
Cincinnati Nature Center
Ancor
Miamiville
Camp Dennison
Mulberry
Day Heights
Ashdale
Owensville
Cozaddale
Goshen
Kings Island
Kings Mills
Zoar
South Lebanon
Morrow
Plea
Ohio River
KENTUCKY
OHIO
INDIANA

MAPPING GEO DATA (CONT.)

- Cached data is contained in an SQLite database
  - Circulation data
    (weekly export of `sierra_view.circ_trans` table view)
  - Patron data
    (weekly export of relevant patron information from multiple table views)

MAPPING GEO DATA (CONT.)

- Geocoding Patron Street Addresses:
  - Patron address data (**patron_record_id**, **street number**, **street name**, **city**, **zip**) are exported to a .csv file

MAPPING GEO DATA (CONT.)

- Possible Geocoding Services:
  - Census.gov
    www.census.gov/data/developers/data-sets/Geoco
    services.html
  - Google
    developers.google.com/maps/documentation/java
  - SmartyStreets
    smartystreets.com/products/list

MAPPING GEO DATA (CONT.)

- SmartyStreets has some very user-friendly services for bulk upload / download of address data for verification and geocoding
- SmartyStreets may be able to offer a discounted / free service to libraries that allow for bulk verification / geocoding as well as on-the-fly verification and auto-corrected address inputs for things such as web input forms

MAPPING GEO DATA (CONT.)

- SmartyStreets list service returns .csv data back with relevant address information, identified by the unique ID (`patron_record_id`) that was provided
- We may easily load this into the local SQLite database with the import csv feature (from the GUI)

MAPPING GEO DATA (CONT.)

- There are very good data analysis / visualization tools available for Python:
  - PyViz

    pyviz.org
  - A Conda metapackage "pyviz"
  - Makes data visualization in Python easier to use

jupyter_notebook_example.pdf