UNIVERSITY OF ARKANSAS
Terrorism Research Center

Terrorism & Homeland Security Research
Crime & Security Data Analysis Lab
Educational Training & Internship Programs

How to Guide

How to Geocode and Map Data Using *Google Sheets* and *Microsoft Excel*

Summary by Kaitlyn Campbell and Hannah Steinman

This guide will walk you through the process of geocoding data using Google sheets to populate latitude and longitude coordinates where you will then be able to map your data using *Microsoft Excel 3D Map* (previously *PowerMap*). The data used for this walkthrough are from the Fayetteville (AR) Police Department calls for service http://www.fayetteville-ar.gov/1333/Police-Fire-Dispatch-Logs.

IMPORTANT: This geocoding process was made available by J. Dougherty and I. Ilyankou (2020) at https://handsondataviz.org/ Chapter 9 → https://handsondataviz.org/geocode.html

To begin the geocoding process you need to open the Geocoder Google Sheet from https://docs.google.com/spreadsheets/d/1XvtkzuVyQ_7Ud47ypDJ4KOmz_5lOpC9sqeEDBbJ5Pbg/edit#gid=0

1. Once you have followed the link above for the geocoder, go to **File -> Make a Copy**. You will then copy and paste your address data from your original dataset (not yet geocoded) into the **Location** column of the copied Google Sheet.

2. You will then highlight all six columns (location, latitude, longitude, found, quality, and source) of your data (leave the headers out). Next, click **Geocoder**. You can choose if you want to geocode with the US census or Google (limit 1,000 geocoded addresses per day). Once you choose, you may be prompted to grant access to the geocoder. Click **Continue** and the geocoding process will begin.

Highlight

Location

	A	B	C	D	E	F
	Location	Latitude	Longitude	Found	Quality	Source
	364 E 7TH ST 2, Fayetteville, AR 72701					
	W PRESERVATION DR, Fayetteville, AR 72701					
	5625 W RELIANCE ST, Fayetteville, AR 72701					
	4546 W SWEETGUM LN, Fayetteville, AR 72701					

Geocoder   All changes saved in Drive

with US Census

with Google (limit 1000 per day)

Geocoder   All changes saved in Drive

with US Census

with Google (limit 1000 per day)

Grant Access

Authorization Required

A script attached to this document needs your permission to run.

Continue   Cancel

Populate

Fayetteville April CFS Assault ☆ ⊡

File Edit View Insert Format Data Tools Add-ons Help Geocoder All   Running script Cancel   Dismiss

⤺ 🖶 ⎙   100% ▾ $ % .0 .00 123▾   Arial   ▾ 10 ▾ **B** *I* S A ◇. ⊞ ⛶ ▾ ≡ ▾ ⊥ ▾ ⊩ ▾ ⩔

ocation

	A	B	C	D	E	F
	Location				No Match	US Census
	4 E 7TH ST 2, Fayetteville, AR 72701	36.055344	-94.15503	364 E 7TH ST, F	Match	US Census
	PRESERVATION DR, Fayetteville, AR 72701				No Match	US Census
	25 W RELIANCE ST, Fayetteville, AR 72701	36.08376	-94.24177	5625 RELIANCE	Match	US Census
	46 W SWEETGUM LN, Fayetteville, AR 72701	36.052177	-94.22567	4546 SWEETGU	Match	US Census
	55 W TRUCKERS DR, Fayetteville, AR 72701	36.108967	-94.183975	1955 W TRUCKE	Match	US Census
	37 W MARTIN LUTHER KING JR BLVD, Fayetteville, AR 72	36.056805	-94.17804	1237 W MARTIN	Match	US Census
	4 W HUGHES ST X, Fayetteville, AR 72701	36.076824	-94.17383	974 W HUGHES	Match	US Census

3. When using the US Census, addresses will either show Match meaning the coordinates were found or No Match meaning coordinates could not be populated. If you use *Google*, you will see Match or Partial Match. Although partial match addresses may not be accurate, you will have latitude and longitude for all addresses in your data set. *Note: there are differences between latitude and longitude coordinates depending on the Geocoder you use, Census or *Google*, for the same address.

Census Geocoder Output

Location				No Match	US Census
364 E 7TH ST 2, Fayetteville, AR 72701	36.055344	-94.15503	364 E 7TH ST, F.	Match	US Census
W PRESERVATION DR, Fayetteville, AR 72701				No Match	US Census
5625 W RELIANCE ST, Fayetteville, AR 72701	36.08376	-94.24177	5625 RELIANCE	Match	US Census
4546 W SWEETGUM LN, Fayetteville, AR 72701	36.052177	-94.22567	4546 SWEETGU	Match	US Census
1955 W TRUCKERS DR, Fayetteville, AR 72701	36.108967	-94.183975	1955 W TRUCKE	Match	US Census
1237 W MARTIN LUTHER KING JR BLVD, Fayetteville, AR 72	36.056805	-94.17804	1237 W MARTIN	Match	US Census
974 W HUGHES ST X, Fayetteville, AR 72701	36.076824	-94.17383	974 W HUGHES	Match	US Census
219 W 15TH ST, Fayetteville, AR 72701	36.048294	-94.162636	219 W 15TH ST,	Exact	US Census
2410 W MOUNT COMFORT RD, Fayetteville, AR 72701	36.092632	-94.193245	2410 MT COMF(	Match	US Census

Google Geocoder Output

Location				Match	Google
1303 N ENGLAND LNK 5, Fayetteville AR, 72701	36.0809683	-94.1937708	1303 England Lir	Partial Match	Google
1649 W SHADOWRIDGE DR, Fayetteville AR, 72701	36.0829193	-94.1332051	1649 Shadowrid(	Match	Google
1100 N COLLEGE AVE, Fayetteville AR, 72701	36.0808707	-94.1600145	1100 N College /	Match	Google
1135 W CATO SPRINGS RD, Fayetteville AR, 72701	36.0413005	-94.177373	1135 W Cato Spr	Match	Google
1153 N WEST END AVE C8, Fayetteville AR, 72701	36.0790807	-94.196808	1153 NW End Av	Match	Google
2407 N ROBIN RD, Fayetteville AR, 72701	36.0958476	-94.1258504	2407 N Robin Rc	Match	Google
1035 N BETTY JO DR 2, Fayetteville AR, 72701	36.0778735	-94.2065287	1035 N Betty Jo	Match	Google
4302 N WATERSIDE CT, Fayetteville AR, 72701	36.1295902	-94.1404009	4302 North Wate	Match	Google
1137 N WEST END AVE B8, Fayetteville AR, 72701	36.0790593	-94.1967705	1137 NW End Av	Match	Google

4. You also have the option to geocode with US Census Geographies using https://docs.google.com/spreadsheets/d/1x_E9KwZ88c_kZvhZ13IF7BNwYKTJFxbfDu77sU1vn5w/edit#gid=0. The steps are the same but there are two extra columns, **GEOID** and **Tract**. Rather than highlighting six, you will highlight eight columns. Using Census geographies allows the data to be matched by the GeoID or the Census tract/block group, making it easier to combine datasets or use your data with other data that has a GeoID or tract available. The GeoID and Tract ID allow for merging data from the Census or American Community Survey and aggregating crime counts based on Tract ID (calculate neighborhood crime counts or rates).

Census Geocoder Output with GeoID and Tract ID

Location	Latitude	Longitude	Found	Quality	Source	GeoID	Tract
1303 N ENGLAND LNK 5, Fayetteville AR, 72701				No Match			
1649 W SHADOWRIDGE DR, Fayetteville AR, 7	36.082664	-94.133156	1649 W SHAD(	Exact	US Census 2010	051430101041001	101.1
1100 N COLLEGE AVE, Fayetteville AR, 72701	36.0773	-94.15708	1100 N COLLE	Match	US Census 2010	051430101074028	101.07
1135 W CATO SPRINGS RD, Fayetteville AR, 7	36.041363	-94.17708	1135 W CATO !	Exact	US Census 2010	051430111012047	111.05
1153 N WEST END AVE C8, Fayetteville AR, 72	36.07858	-94.161285	1153 W END A'	Match	US Census 2010	051430107022024	107.06
2407 N ROBIN RD, Fayetteville AR, 72701	36.095757	-94.126625	2407 N ROBIN	Match	US Census 2010	051430101072009	101.07
1035 N BETTY JO DR 2, Fayetteville AR, 7270*	36.07723	-94.20608	1035 N BETTY	Match	US Census 2010	051430105061004	105.21

The next half of the guide will walk you through mapping your newly coordinated data using Microsoft Excel 3D Map. You will need to move your data to excel to begin.
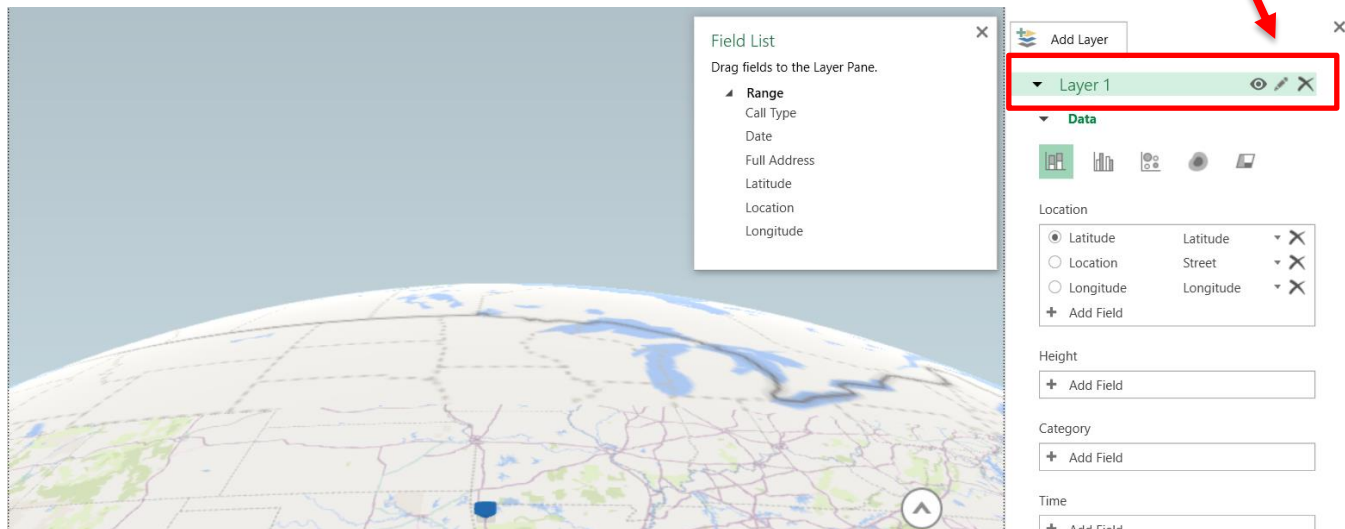
Note: Excel can map data based on address information only and does not require latitude and longitude coordinates. Unfortunately, this function is not available for Mac machines.

5. After you copy your data from the *Google* Geocoder Sheet to Excel, highlight your data with the coordinates, go to the **Insert tab**, click **3D Map**, then click **open 3D maps**. A new window will open with your data. Be sure to name your layer on the right side of your screen.

6. You will see that your data fields populated (column names). You can toggle the view with the arrows on the map, zoom in to take a closer look at your data. If you want to see how many calls are made at a location, go to your layer pane on the right of the screen, under **Height** click **Add Field** and choose **Location**. You can also change the color scheme of your map by going to **Themes** in the Home pane.
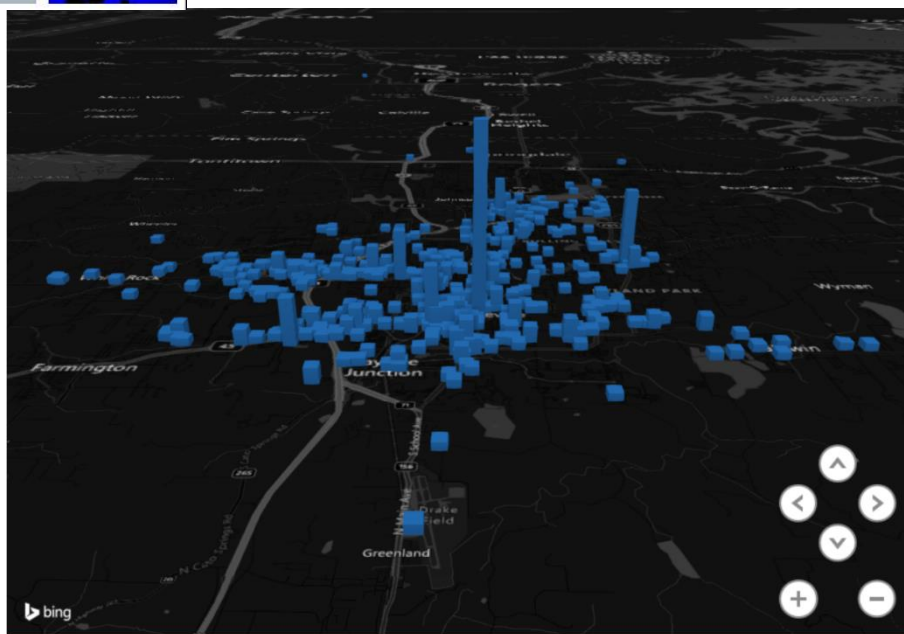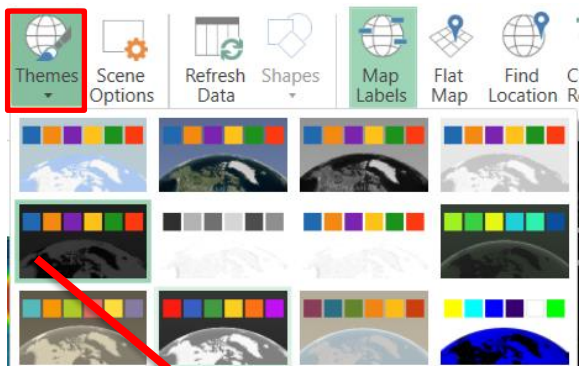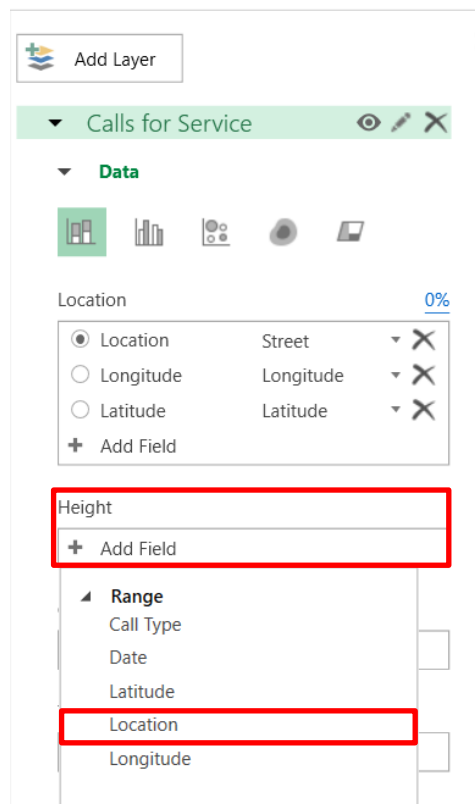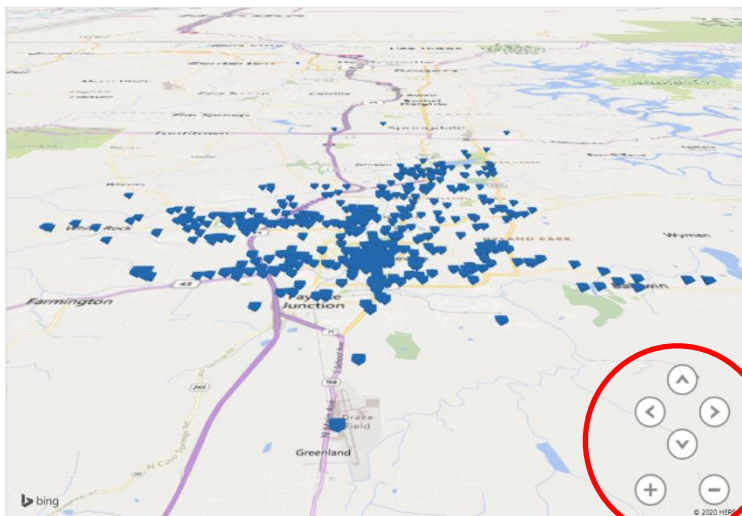
7. You can also change the way that your data are displayed. Go to your layer pane, click the layer you want to change, click **Data**, and choose the visualization you would like. **Heat Map** was used for this example, more commonly known as a hotspot map. To change the color scheme or radius of the heat map, go to the layer pane, click the layer, and then **Layer Options**. You can adjust the scale, radius, and color scheme of your map.
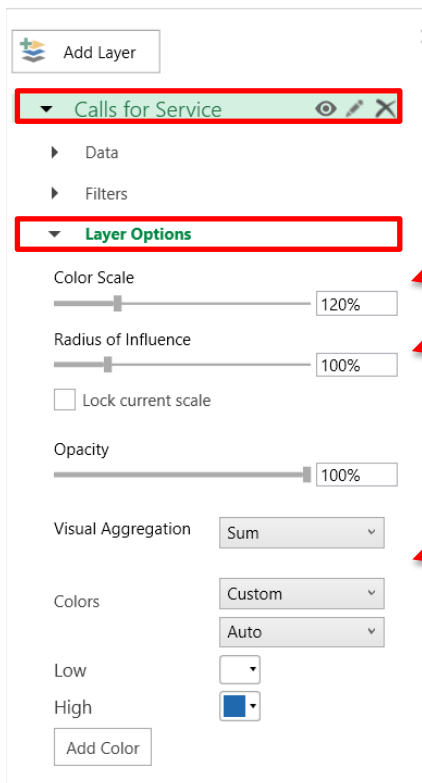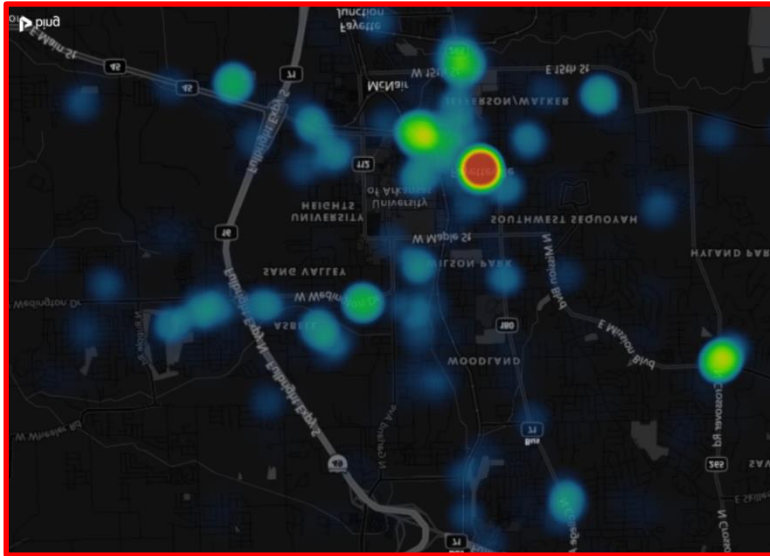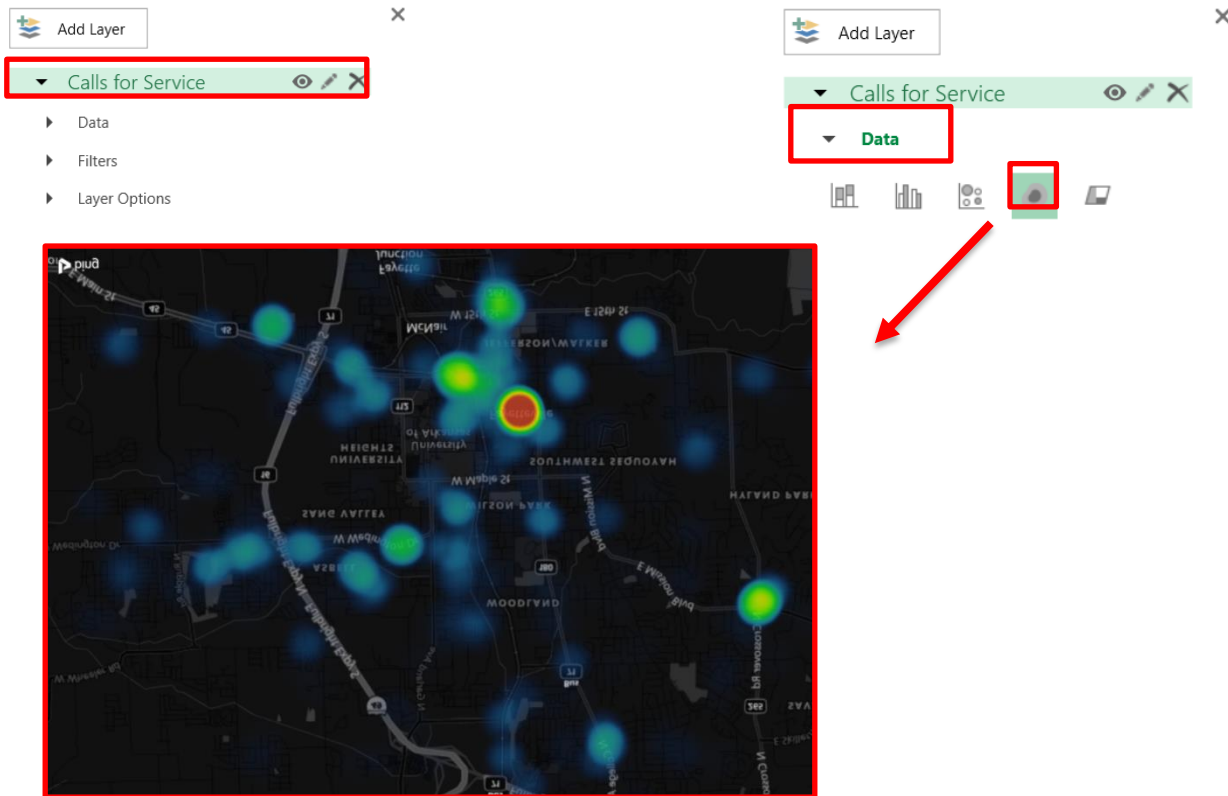
8. Next, you should add a title and legend to your map. To add a title, click **Text Box** on the Home pane. The Add Text Box will appear where you can then title your map. To add a legend, click **Legend**, also listed on the Home pane.

9. You also have the option to turn map labels on to see street names and locations. Under the home pane click **Map Labels**. Now you can zoom in on your data and see which streets or areas have the most calls for service.
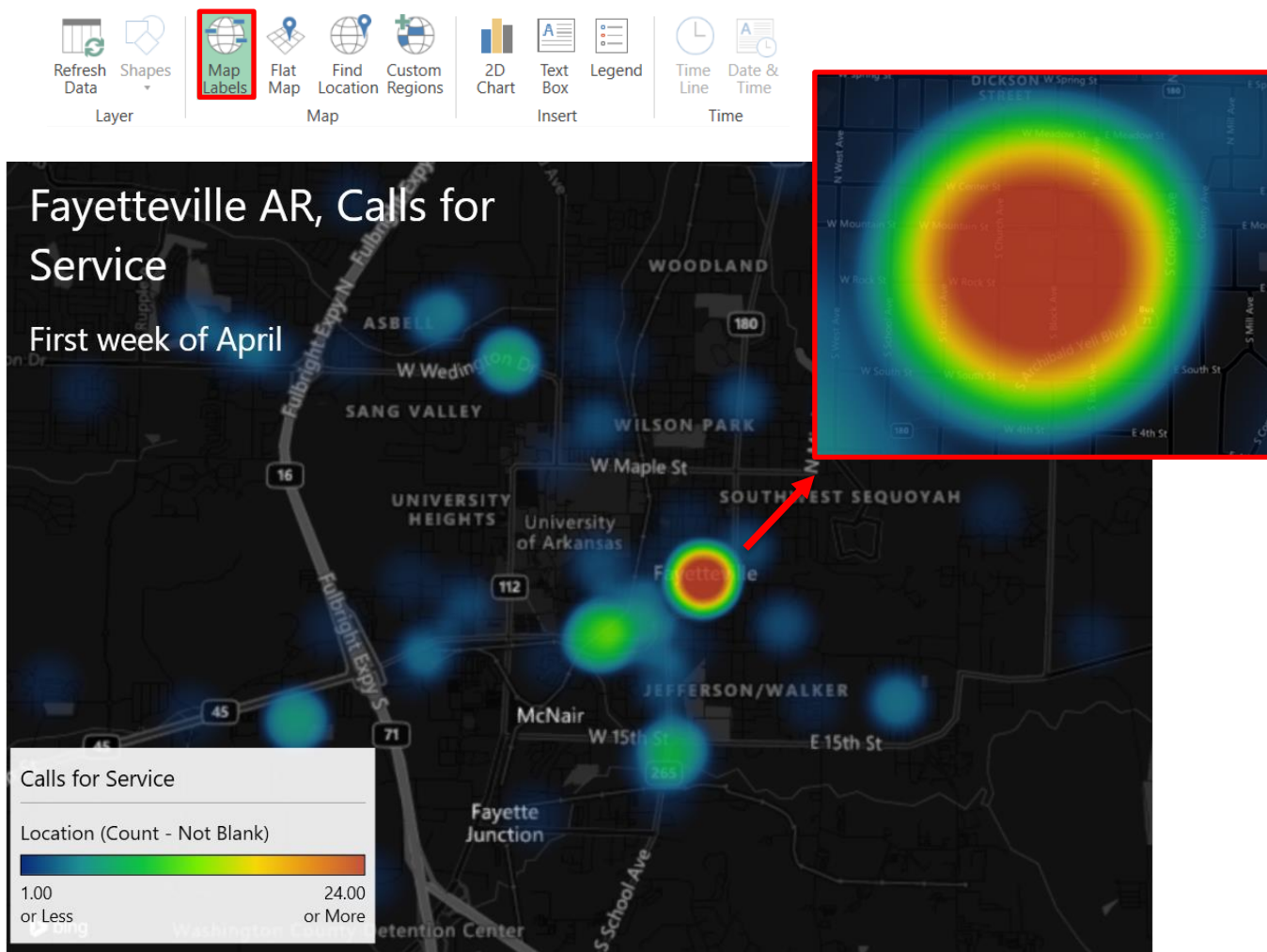
You now know how to geocode and map your data!