

# Performing Table Joins

## QGIS Tutorials and Tips



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# Melakukan Join Tabel

Tidak setiap dataset yang anda ingin gunakan sudah berupa shapefile atau sudah dalam format spasial. Seringkali data berupa tabel atau sebuah spreadsheet dan anda ingin menghubungkannya dengan data spasial yang sudah ada untuk anda gunakan dalam analisis. Operasi ini dikenal dengan **Table Join** dan tutorial ini akan menlingkupi bagaimana memperoleh join tabel di QGIS

## Tinjauan Tugas

Kita akan menggunakan sebuah shapefile dari daerah Sensus untuk California dan tabel data populasi dari Biro Sensus Amerika Serikat untuk menghasilkan sebuah peta populasi untuk California.

### *Skill lain yang akan anda pelajari*

- Buat file **.csvt** untuk mengindikasikan tipe data kolom di sebuah file CSV.
- Membuka file CSV yang tidak mempunyai geometri di QGIS.

## Mendapatkan data

[US Census Bureau](#) has various spatial extracts from the MAF/TIGER database. You can query and download census tracts shapefile for California. Download [Census Tracts for California](#) file.

[Americal FactFinder](#) adalah sebuah repositori dari semua data sensus AS. Anda dapat menggunakan **Advanced Search** dan query untuk **Topic - Total Population** and **Geographies - All Census Tracts in California** dan **Geographies - All Census Tracts in California** untuk menghasilkan sebuah CSV kustom dan mengunduhnya. Tutorial ini menggunakan data **Total Population 2010 Census Summary File 1**.

For convenience, you may directly download a copy of both the datasets from the links below:

[tl\\_2013\\_06\\_tract.zip](#)

[ca\\_tracts\\_pop.csv](#)

Sumber Data [TIGER] [USCENSUS]

## Prosedur

1. Pertama-tama kita akan membuka shapefile census tract. Akses Layer ▸ Add Vector Layer.



2. Browse to the downloaded zip file ***t1\_2013\_06\_tract.zip*** and select it. QGIS can open zip files directly so no need to uncompress it first.



3. Select the ***t1\_2013\_06\_tract.shp*** layer and click OK.



4. Anda akan melihat daerah sensus terbuka di QGIS.



5. klik kanan pada layer dan pilih Open Attribute Table.



6. Periksa attribut dari shapefile tracts. Untuk menggabungkan sebuah tabel dan shapefile ini, kita membutuhkan sebuah atribut unik dan sama untuk setiap fitur, field GEOID merupakan pengidentifikasi unik untuk setiap tract dan dapat digunakan untuk **link** shapefile ini dengan tabel lain yang memiliki ID yang sama.

Attribute table - tl\_2013\_06\_tract :: Features total: 8057, filtered: 8057, selected: 0

|    | STATEFP | COUNTYFP | TRACTCE | GEOID       | NAME    | NAMELSAD           | MTFCC |
|----|---------|----------|---------|-------------|---------|--------------------|-------|
| 0  | 06      | 001      | 442700  | 06001442700 | 4427    | Census Tract 44... | G5020 |
| 1  | 06      | 001      | 442800  | 06001442800 | 4428    | Census Tract 44... | G5020 |
| 2  | 06      | 037      | 204920  | 06037204920 | 2049.20 | Census Tract 20... | G5020 |
| 3  | 06      | 037      | 205110  | 06037205110 | 2051.10 | Census Tract 20... | G5020 |
| 4  | 06      | 037      | 205120  | 06037205120 | 2051.20 | Census Tract 20... | G5020 |
| 5  | 06      | 037      | 206010  | 06037206010 | 2060.10 | Census Tract 20... | G5020 |
| 6  | 06      | 037      | 206020  | 06037206020 | 2060.20 | Census Tract 20... | G5020 |
| 7  | 06      | 037      | 206050  | 06037206050 | 2060.50 | Census Tract 20... | G5020 |
| 8  | 06      | 037      | 207400  | 06037207400 | 2074    | Census Tract 20... | G5020 |
| 9  | 06      | 001      | 442900  | 06001442900 | 4429    | Census Tract 44... | G5020 |
| 10 | 06      | 037      | 192410  | 06037192410 | 1924.10 | Census Tract 19... | G5020 |
| 11 | 06      | 037      | 192510  | 06037192510 | 1925.10 | Census Tract 19... | G5020 |
| 12 | 06      | 037      | 192520  | 06037192520 | 1925.20 | Census Tract 19... | G5020 |
| 13 | 06      | 037      | 192610  | 06037192610 | 1926.10 | Census Tract 19... | G5020 |
| 14 | 06      | 037      | 192700  | 06037192700 | 1927    | Census Tract 19... | G5020 |
| 15 | 06      | 037      | 194500  | 06037194500 | 1945    | Census Tract 19... | G5020 |
| 16 | 06      | 037      | 195100  | 06037195100 | 1951    | Census Tract 19... | G5020 |
| 17 | 06      | 037      | 195300  | 06037195300 | 1953    | Census Tract 19... | G5020 |
| 18 | 06      | 001      | 443001  | 06001443001 | 4430.01 | Census Tract 44... | G5020 |
| 19 | 06      | 001      | 443002  | 06001443002 | 4430.02 | Census Tract 44... | G5020 |
| 20 | 06      | 001      | 443102  | 06001443102 | 4431.02 | Census Tract 44... | G5020 |
| 21 | 06      | 001      | 443301  | 06001443301 | 4433.01 | Census Tract 44... | G5020 |

Show All Features

- Open the CSV file *ca\_tracts\_pop.csv* in a text editor. You will notice that each row of the file contains information about a tract along with the unique identifier we saw in the previous step. Note that this field is called GEO.id2 in the CSV. You will also note that the D001 column has population value for each of the census tract.

```
POPGRP.id,POPGRP.display-label,GEO.id,GEO.id2,GEO.display-label,D001
001,Total population,1400000US06001400100,06001400100,"Census Tract 4001, Alameda County, California",2937
001,Total population,1400000US06001400200,06001400200,"Census Tract 4002, Alameda County, California",1974
001,Total population,1400000US06001400300,06001400300,"Census Tract 4003, Alameda County, California",4865
001,Total population,1400000US06001400400,06001400400,"Census Tract 4004, Alameda County, California",3703
001,Total population,1400000US06001400500,06001400500,"Census Tract 4005, Alameda County, California",3517
001,Total population,1400000US06001400600,06001400600,"Census Tract 4006, Alameda County, California",1571
001,Total population,1400000US06001400700,06001400700,"Census Tract 4007, Alameda County, California",4206
001,Total population,1400000US06001400800,06001400800,"Census Tract 4008, Alameda County, California",3594
001,Total population,1400000US06001400900,06001400900,"Census Tract 4009, Alameda County, California",2302
001,Total population,1400000US06001401000,06001401000,"Census Tract 4010, Alameda County, California",5678
001,Total population,1400000US06001401100,06001401100,"Census Tract 4011, Alameda County, California",4156
001,Total population,1400000US06001401200,06001401200,"Census Tract 4012, Alameda County, California",2416
001,Total population,1400000US06001401300,06001401300,"Census Tract 4013, Alameda County, California",3528
001,Total population,1400000US06001401400,06001401400,"Census Tract 4014, Alameda County, California",4314
001,Total population,1400000US06001401500,06001401500,"Census Tract 4015, Alameda County, California",2630
001,Total population,1400000US06001401600,06001401600,"Census Tract 4016, Alameda County, California",2163
001,Total population,1400000US06001401700,06001401700,"Census Tract 4017, Alameda County, California",2667
001,Total population,1400000US06001401800,06001401800,"Census Tract 4018, Alameda County, California",1703
001,Total population,1400000US06001402200,06001402200,"Census Tract 4022, Alameda County, California",2385
001,Total population,1400000US06001402400,06001402400,"Census Tract 4024, Alameda County, California",2351
001,Total population,1400000US06001402500,06001402500,"Census Tract 4025, Alameda County, California",1784
001,Total population,1400000US06001402600,06001402600,"Census Tract 4026, Alameda County, California",1151
001,Total population,1400000US06001402700,06001402700,"Census Tract 4027, Alameda County, California",1569
001,Total population,1400000US06001402800,06001402800,"Census Tract 4028, Alameda County, California",3345
001,Total population,1400000US06001402900,06001402900,"Census Tract 4029, Alameda County, California",1434
001,Total population,1400000US06001403000,06001403000,"Census Tract 4030, Alameda County, California",2788
001,Total population,1400000US06001403100,06001403100,"Census Tract 4031, Alameda County, California",2238
```

8. We could import this csv file without any further action and it would be imported. But, the default type of each column would be a String (text). That is ok except for the **D001** field which contains numbers for the population. Having those imported as text would not allow us to run any mathematical operations on this column. To tell QGIS to import the field as a number, we need to create a **sidecar** file with a **.csvt** extension. This file will have only 1 row specifying data types for each column. Save this file as **ca\_tracts\_pop.csvt** in the same directory as the original **.csv** file. You can also [download the csvt file from here](#).



9. Sekarang kita siap mengimpor file CSV ke QGIS. Akses Layer ▸ Add Delimited Text Layer.





10. Jelajahi folder yang berisi file CSV dan pilih. Pastikan anda telah memilih File format dengan CSV (comma separated values) . Karena kita sedang mengimpor ini sebagai tabel, kita harus merinci bahwa file kita tidak berisi geometri. Pilih opsi No geometry (attribute only table) . Klik OK.

**Create a Layer from a Delimited Text File**

File Name:  Browse...

Layer name:  Encoding:

File format: ☒ CSV (comma separated values) ☐ Custom delimiters ☐ Regular expression delimiter

Record options: Number of header lines to discard:  ☒ First record has field names

Field options: ☐ Trim fields ☐ Discard empty fields ☐ Decimal separator is comma

Geometry definition: ☐ Point coordinates ☐ Well known text (WKT) ☒ No geometry (attribute only table)

Layer settings: ☐ Use spatial index ☐ Use subset index ☐ Watch file

|   | POPGROUP.id | POPGROUP.display-label | GEO.id               | GEO.id2     | GEO.display-label                 |
|---|-------------|------------------------|----------------------|-------------|-----------------------------------|
| 1 | 001         | Total population       | 1400000US06001400100 | 06001400100 | Census Tract 4001, Alameda County |
| 2 | 001         | Total population       | 1400000US06001400200 | 06001400200 | Census Tract 4002, Alameda County |
| 3 | 001         | Total population       | 1400000US06001400300 | 06001400300 | Census Tract 4003, Alameda County |
| 4 | 001         | Total population       | 1400000US06001400400 | 06001400400 | Census Tract 4004, Alameda County |
| 5 | 001         | Total population       | 1400000US06001400500 | 06001400500 | Census Tract 4005, Alameda County |

OK Cancel Help

11. File CSV sekarang terimpor sebagai tabel ke QGIS.



12. Select the *tl\_2013\_06\_tract* layer. Right-click on it and select Properties.



13. Pada dialog Layer Properties , pillih tab Joins . Klik tombol + pada bagian bawah untuk membuat sebuah join tabel yang baru.



14. In the Add vector join dialog, select *ca\_tracts\_pop* as the Join layer. Next we have to select the field with unique ids in both the shapefile and the CSV. Select **GEO.id2** and **GEOID** as the Join field and Target field respectively. Click OK.



15. Close the Layer Properties dialog and return to the main QGIS window. At this point, the fields from the CSV file are joined with the shapefile. Right-click on the *tl\_2013\_06\_tract* layer and select Open Attribute Table.



16. Sekarang anda dapat melihat sebuah set field yang baru, termasuk field `ca_tracts_pop_D001` yang ditambahkan pada tiap fitur. Sekarang anda memiliki akses untuk angka populasi untuk setiap tract dari file CSV. Tutup tabel attrtribut dan kembali ke jendela utama QGIS.

Attribute table - tl\_2013\_06\_tract :: Features total: 8057, filtered: 8057, selected: 0

|    | INTPTLAT    | INTPTLON     | tracts_pop_POPGRC | op_POPGROURdi    | tracts_pop_GEC | pop_GEQdis    | ca_tracts_pop_D001 |
|----|-------------|--------------|-------------------|------------------|----------------|---------------|--------------------|
| 0  | +37.5371514 | -122.0081094 | 001               | Total population | 1400000US06... | Census Tra... | 2873               |
| 1  | +37.5293619 | -121.9931002 | 001               | Total population | 1400000US06... | Census Tra... | 2816               |
| 2  | +34.0175004 | -118.1974975 | 001               | Total population | 1400000US06... | Census Tra... | 2598               |
| 3  | +34.0245059 | -118.2142985 | 001               | Total population | 1400000US06... | Census Tra... | 3766               |
| 4  | +34.0187546 | -118.2117956 | 001               | Total population | 1400000US06... | Census Tra... | 3618               |
| 5  | +34.0682177 | -118.2320356 | 001               | Total population | 1400000US06... | Census Tra... | 3127               |
| 6  | +34.0571230 | -118.2311021 | 001               | Total population | 1400000US06... | Census Tra... | 7883               |
| 7  | +34.0299036 | -118.2244531 | 001               | Total population | 1400000US06... | Census Tra... | 2146               |
| 8  | +34.0561941 | -118.2466502 | 001               | Total population | 1400000US06... | Census Tra... | 1363               |
| 9  | +37.5184093 | -121.9748369 | 001               | Total population | 1400000US06... | Census Tra... | 7194               |
| 10 | +34.0798577 | -118.3181008 | 001               | Total population | 1400000US06... | Census Tra... | 3628               |
| 11 | +34.0798690 | -118.3068568 | 001               | Total population | 1400000US06... | Census Tra... | 3670               |
| 12 | +34.0799255 | -118.3024972 | 001               | Total population | 1400000US06... | Census Tra... | 5067               |
| 13 | +34.0813650 | -118.2961539 | 001               | Total population | 1400000US06... | Census Tra... | 4389               |
| 14 | +34.0800134 | -118.2881064 | 001               | Total population | 1400000US06... | Census Tra... | 3513               |
| 15 | +34.0781753 | -118.3695958 | 001               | Total population | 1400000US06... | Census Tra... | 2037               |
| 16 | +34.1022274 | -118.2669741 | 001               | Total population | 1400000US06... | Census Tra... | 4717               |
| 17 | +34.0992506 | -118.2836893 | 001               | Total population | 1400000US06... | Census Tra... | 3203               |
| 18 | +37.5184218 | -121.9515237 | 001               | Total population | 1400000US06... | Census Tra... | 2917               |
| 19 | +37.5168344 | -121.9605916 | 001               | Total population | 1400000US06... | Census Tra... | 5918               |
| 20 | +37.5071943 | -121.9271475 | 001               | Total population | 1400000US06... | Census Tra... | 4611               |
| 21 | +37.4707325 | -121.9129556 | 001               | Total population | 1400000US06... | Census Tra... | 4074               |

Show All Features

17. Right-click the *tl\_2013\_06\_tract* layer and select Properties.





18. Pilih tab Style . Pilih Graduated dari menu drop-down. Karena kita mencoba untuk membuat sebuah peta populasi, kita ingin menetapkan warna yang berbeda pada tiap daerah sensus. berdasarkan perhitungan populasi. Pilih `ca_tracts_pop_D001` sebagai Column . Pilih sebuah daftar warna yang anda suka dari drop-down Color ramp . Pada Mode , pilih Quantile (Equal Count) . Berikutnya klik Classify . Anda akan melihat sebuah warna yang berbeda sudah ditetapkan dengan interval populasi tertentu. Klik OK.





19. Sekarang anda akan melihat visualisasi dari daerah sensus yang telah melalui perubahan style menggunakan angka populasi. Gunakan tool Zoom in untuk memilih area yang lebih kecil pada layer.



20. Anda mempunyai Peta Populasi California yang detail dan akurat. Anda juga bisa menggunakan teknik yang sama untuk membuat peta berdasarkan variasi data sensus.

