

Working with Attributes

QGIS Tutorials and Tips



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Работа с атрибутами

Данные ГИС состоят из двух частей: объектов и атрибутов. Атрибуты – это структурированные данные о каждом объекте. Этот урок показывает, как просматривать атрибуты и делать базовые запросы к ним в QGIS.

Обзор задачи

Набор данных для этого урока содержит информацию о населенных местах мира. Задача заключается в том, чтобы запросить и найти все столицы в мире с населением более чем 1.000.000.



- Выбирать объекты из слоя, используя выражения.
- Снимать выделение с объектов слоя, используя панель инструментов Attributes.
- Использовать Query Builder для просмотра подмножества объектов слоя.

Получение данных

Natural Earth has a nice [Populated Places](#) dataset. Download the [simple \(less columns\) dataset](#)

Для удобства вы можете загрузить наборы данных напрямую по ссылке ниже:

[ne_10m_populated_places_simple.zip](#)

Источник данных: [NATURALEARTH]

Методика

1. Once you have downloaded the data, open QGIS. Go to Layer › Add Layer › Add Vector Layer.



2. Нажмите на Browse и перейдите к папке, в которую вы загрузили данные.



3. Найдите загруженный zip-файл ***ne_10m_populated_places_simple.zip***. Вам не нужно распаковывать файл. QGIS может читать архивные файлы напрямую. Выберите файл и нажмите :guilabel: .



4. Теперь выбранный слой будет загружен в QGIS, и вы увидите много точек, представляющих населенные пункты мира.



5. Right-click the layer and select Open Attribute Table.



6. Исследуйте различные атрибуты и их значения.

Attribute table - ne_10m_populated_places_simple :: Features total: 7322, filtered: 7322, selected: 0

| | scalerank | natscale | labelrank | featurecla | name | namepar | namealt |
|----|-----------|----------|-----------|-----------------|----------------------|---------|---------|
| 0 | 10 | 1 | 8 | Admin-1 capital | Colonia del Sacra... | NULL | NULL |
| 1 | 10 | 1 | 8 | Admin-1 capital | Trinidad | NULL | NULL |
| 2 | 10 | 1 | 8 | Admin-1 capital | Fray Bentos | NULL | NULL |
| 3 | 10 | 1 | 8 | Admin-1 capital | Canelones | NULL | NULL |
| 4 | 10 | 1 | 8 | Admin-1 capital | Florida | NULL | NULL |
| 5 | 10 | 1 | 8 | Admin-1 capital | Bassar | NULL | NULL |
| 6 | 10 | 1 | 8 | Admin-1 capital | Sotouboua | NULL | NULL |
| 7 | 10 | 1 | 7 | Admin-1 capital | Medenine | NULL | NULL |
| 8 | 10 | 1 | 7 | Admin-1 capital | Kebili | NULL | NULL |
| 9 | 10 | 1 | 7 | Admin-1 capital | Tataouine | NULL | NULL |
| 10 | 10 | 1 | 7 | Admin-1 capital | L'Ariana | NULL | NULL |
| 11 | 10 | 1 | 7 | Admin-1 capital | Jendouba | NULL | NULL |
| 12 | 10 | 1 | 7 | Admin-1 capital | Kasserine | NULL | NULL |
| 13 | 10 | 1 | 7 | Admin-1 capital | Sdid Bouzid | NULL | NULL |
| 14 | 10 | 1 | 7 | Admin-1 capital | Siliana | NULL | NULL |
| 15 | 10 | 1 | 7 | Admin-1 capital | Mahdia | NULL | NULL |
| 16 | 10 | 1 | 7 | Admin-1 capital | Monastir | NULL | NULL |
| 17 | 10 | 1 | 7 | Admin-1 capital | Zaghouan | NULL | NULL |
| 18 | 10 | 1 | 5 | Admin-1 capital | Tay Ninh | NULL | NULL |

Show All Features

7. Нас интересует население каждого объекта, так что **pop_max** является искомым полем. Вы можете дважды щелкнуть на заголовке поля для сортировки столбца в порядке убывания.

Attribute table - ne_10m_populated_places_simple :: Features total: 7322, filtered: 7322, selected: 0

| | longitude | changed | namediff | diffnote | pop_max | pop_min | pop_other |
|------|------------------|----------------|----------|---------------------|----------|----------|-----------|
| 7312 | 139.75140742900 | 0.000000000000 | 0 | NULL | 35676000 | 8336599 | 1294525 |
| 7297 | -73.98001692880 | 0.000000000000 | 0 | NULL | 19040000 | 8008278 | 929260 |
| 7303 | -99.13098820170 | 0.000000000000 | 0 | NULL | 19028000 | 10811002 | 1001844 |
| 7313 | 72.85698929740 | 0.000000000000 | 0 | NULL | 18978000 | 12691836 | 1242608 |
| 7318 | -46.62501998040 | 0.000000000000 | 0 | NULL | 18845000 | 10021295 | 1152294 |
| 7221 | 77.23000402720 | 4.000000000000 | 0 | Changed feature... | 15926000 | 7633213 | 674738 |
| 7311 | 121.43650467800 | 0.000000000000 | 0 | NULL | 14987000 | 14608512 | 1680357 |
| 7316 | 88.32467565810 | 4.000000000000 | 1 | Name changed. ... | 14787000 | 4631392 | 778371 |
| 7248 | 90.40857946670 | 5.000000000000 | 0 | Changed scale ra... | 12797394 | 7000940 | 1499553 |
| 7290 | -58.39753137370 | 0.000000000000 | 0 | NULL | 12795000 | 10929146 | 1027145 |
| 7295 | -118.17998051100 | 0.000000000000 | 0 | NULL | 12500000 | 3694820 | 14226 |
| 7168 | 66.99000891000 | 5.000000000000 | 0 | Changed scale ra... | 12130000 | 11624219 | 1157027 |
| 7310 | 31.24996821970 | 0.000000000000 | 0 | NULL | 11893000 | 7734614 | 1372055 |
| 7317 | -43.22502079420 | 0.000000000000 | 0 | NULL | 11748000 | 2010175 | 182148 |
| 7280 | 135.46014481500 | 4.000000000000 | 0 | Changed feature... | 11294000 | 2592413 | 963078 |
| 7306 | 116.38828568400 | 0.000000000000 | 0 | NULL | 11106000 | 7480601 | 903323 |
| 7274 | 120.98221716200 | 0.000000000000 | 0 | NULL | 11100000 | 3077575 | 238128 |
| 7302 | 37.61552282590 | 0.000000000000 | 0 | NULL | 10452000 | 10452000 | 1058538 |
| 7299 | 29.01000158560 | 0.000000000000 | 0 | NULL | 10061000 | 9945610 | 965148 |

Show All Features

8. Now we are ready to perform our query on these attributes. QGIS uses SQL-like expressions to perform queries. Click Select features using an expression.

Attribute table - ne_10m_populated_places_simple :: Features total: 7322, filtered: 7322, selected: 0

| | longitude | changed | namediff | diffnote | pop_max | pop_min | pop_other |
|------|------------------|----------------|----------|---------------------|----------|----------|-----------|
| 7312 | 139.75140742900 | 0.000000000000 | 0 | NULL | 35676000 | 8336599 | 1294525 |
| 7297 | -73.98001692880 | 0.000000000000 | 0 | NULL | 19040000 | 8008278 | 929260 |
| 7303 | -99.13098820170 | 0.000000000000 | 0 | NULL | 19028000 | 10811002 | 1001844 |
| 7313 | 72.85698929740 | 0.000000000000 | 0 | NULL | 18978000 | 12691836 | 1242608 |
| 7318 | -46.62501998040 | 0.000000000000 | 0 | NULL | 18845000 | 10021295 | 1152294 |
| 7221 | 77.23000402720 | 4.000000000000 | 0 | Changed feature... | 15926000 | 7633213 | 674738 |
| 7311 | 121.43650467800 | 0.000000000000 | 0 | NULL | 14987000 | 14608512 | 1680357 |
| 7316 | 88.32467565810 | 4.000000000000 | 1 | Name changed. ... | 14787000 | 4631392 | 778371 |
| 7248 | 90.40857946670 | 5.000000000000 | 0 | Changed scale ra... | 12797394 | 7000940 | 1499553 |
| 7290 | -58.39753137370 | 0.000000000000 | 0 | NULL | 12795000 | 10929146 | 1027145 |
| 7295 | -118.17998051100 | 0.000000000000 | 0 | NULL | 12500000 | 3694820 | 14226 |
| 7168 | 66.99000891000 | 5.000000000000 | 0 | Changed scale ra... | 12130000 | 11624219 | 1157027 |
| 7310 | 31.24996821970 | 0.000000000000 | 0 | NULL | 11893000 | 7734614 | 1372055 |
| 7317 | -43.22502079420 | 0.000000000000 | 0 | NULL | 11748000 | 2010175 | 182148 |
| 7280 | 135.46014481500 | 4.000000000000 | 0 | Changed feature... | 11294000 | 2592413 | 963078 |
| 7306 | 116.38828568400 | 0.000000000000 | 0 | NULL | 11106000 | 7480601 | 903323 |
| 7274 | 120.98221716200 | 0.000000000000 | 0 | NULL | 11100000 | 3077575 | 238128 |
| 7302 | 37.61552282590 | 0.000000000000 | 0 | NULL | 10452000 | 10452000 | 1058538 |
| 7299 | 29.01000158560 | 0.000000000000 | 0 | NULL | 10061000 | 9945610 | 965148 |

Show All Features

9. In the Select By Expression window, expand the Fields and Values section and double-click the *pop_max* label. You will notice that it is added to the expression section at the bottom. If you aren't sure about the field values, you can click the Load all unique values to see what the attribute values are present in the dataset. For this exercise, we are looking to find all features that have a population greater than 1,000,000. So complete the expression as below and click Select.

"pop_max" > 1000000



10. Click on Close and return to the main QGIS window. You will notice that a subset of points is now rendered in yellow. This is the result of our query and you are seeing all places from the dataset that have the *pop_max* attribute value greater than 1,000,000.



11. The goal for this exercise is to find the places that are country capitals. The field containing this data is **adm0cap**. The value **1** indicates that the place is a capital. We can add this criteria to our previous expression using the **and** operator. Let's refine our query to select only those places which are capitals. Click on the Select feature using an expression button in the attribute table and enter the expression as below and click Select and then Close.

```
"pop_max" > 1000000 and "adm0cap" = 1
```



12. Return to the main QGIS window. Now you will see a smaller subset of the points selected. This is the result of the second query and shows all places from the dataset that are country capitals as well as have population greater than 1,000,000. If we wanted to do some further analysis on this subset of data, we can make this selection persistent. Right-click the *ne_10m_populated_places_simple* layer and select Properties.



13. In the General tab, scroll down to the Feature subset section. Click Query Builder.



14. Enter the same expression you had entered earlier and click OK.

```
"pop_max" > 1000000 and "adm0cap" = 1
```



15. Back in the main QGIS window, you will see rest of the points disappear. You may now perform any other analysis on this layer and only the features that match our expression will be used. You will notice that the points still appear in yellow. This is because they are still selected. Find the Deselect Features from All Layers button under the Attributes toolbar and click on it.



16. You will see that the points are now de-selected and rendered in their original color.

