

# Find Neighbor Polygons in a Layer

QGIS Tutorials and Tips



Author

Ujaval Gandhi

<http://google.com/+UjavalGandhi>

Translations by

SongHyun Choi

■■■ ■■■■ ■■■

■■■■■ ■ ■■■■ ■■■ ■■■■ ■■■ ■■■ ■■ ■■■ ■■ ■■■ ■■■■. QGIS■■■ ■■■ ■■■ ■■■■■ ■■■■ ■ ■■ ■ ■■■ ■■■ ■■■ ■■■■. ■■ ■■ ■■■■■ ■■■■■ ■ ■■■■ ■■■ ■■■■ ■■ ■■■■ ■■ ■■■ ■■ ■■■■ ■■■ ■■ ■■■■ ■■■ ■■■■. ■■■■■ ■■■■■ ■■ ■■ ■■■ ■■■■■■ ■■■ ■■■ ■■■■■■.

■■■ ■■■

■■■ ■■■■■ ■■■■■ ■■■■ ■■ ■■■ ■■■ ■■■■ ■■■■ ■■■ ■■■ ■■■ ■■ ■■■■. ■■ ■■■ ■■■ ■■ ■■■■ ■■■■■ ■■■.

■■■■ ■■■

Natural Earth■ [Admin 0 - Countries](#) ■■■■■ ■■■ ■■■■.

Download the [Admin 0 - countries shapefile](#)..

■■■ ■■: [NATURALEARTH]

■■■■■ ■■■

Download the `neighbors.py script` and save it to your disk.

■■■

```
1. ■■ ■■■ --> ■■ ■■■ ■■ ``ne_10m_admin_0_countries`` ■■ ■■  
   ``ne_10m_admin_0_countries``■■■■■ ■■■■■.
```



2. `name` `Identify` `**NAME**` `**POP_EST**`



3. ■■■■■ --> Phtyon ■■ :menuselection: `Plugins --> Python Console` ■■■■■.



4. Phthon ■■■■■■■■■■ Show Editor ■■■■■■■■■■.



5. `Editor`  
 :guilabel:`Open file` neighbors.py  
 :guilabel:`Open``



6. `def process_algorithm(self):  
 # Get the input layer  
 input_layer = self.get_layer_by_name('ne_10m_admin_0_countries')  
 # Create a new layer for the output  
 output_layer = QgsVectorLayer('Polygon', 'Output Layer', 'memory')  
 # Add a field for the sum of the input layer's fields  
 output_layer.addFields([QgsField('_SUM_FIELD', QVariant.Type.Int)])  
 # Create a new QgsFeature for each input feature  
 for feature in input_layer.getFeatures():  
 # Create a new QgsFeature for the output layer  
 output_feature = QgsFeature(output_layer.fields())  
 # Set the geometry of the output feature  
 output_feature.setGeometry(feature.geometry())  
 # Set the value of the sum field  
 output_feature['_SUM_FIELD'] = feature['_SUM_FIELD']  
 # Add the output feature to the output layer  
 output_layer.addFeature(output_feature)  
 # Return the output layer  
 return output_layer`



7. `ne_10m_admin_0_countries` `:guiabel: Open Attribute Table`.





8. You will notice 2 new attributes called NEIGHBORS and SUM. These were added by the script.

Attribute table - ne\_10m\_admin\_0\_countries :: Features total: 255, filtered: 255, selected: 0

	ION	REGION_WB	NAME_LEN	LONG_LEN	ABBREV_LEN	TINY	HOMEPART	NEIGHBORS	SUM
0		Latin America & ...	5.00	5.00	5.00	4.00	-99.00	NULL	0
1	sia	South Asia	11.00	11.00	4.00	-99.00	1.00	Iran,Turkmenista...	1621125240
2	a	Sub-Saharan Africa	6.00	6.00	4.00	-99.00	1.00	Namibia,Zambia,...	86676756
3		Latin America & ...	8.00	8.00	4.00	-99.00	-99.00	NULL	0
4	urope	Europe & Central...	7.00	7.00	4.00	-99.00	1.00	Macedonia,Greec...	15281164
5	urope	Europe & Central...	5.00	13.00	5.00	5.00	-99.00	NULL	0
6	urope	Europe & Central...	7.00	7.00	4.00	5.00	1.00	France,Spain	104582794
7	ia	Middle East & No...	20.00	20.00	6.00	-99.00	1.00	Saudi Arabia,Oman	32104718
8	ica	Latin America & ...	9.00	9.00	4.00	-99.00	1.00	Bolivia,Paraguay,...	235606259
9	ia	Europe & Central...	7.00	7.00	4.00	-99.00	1.00	Georgia,Turkey,I...	156089287
10		East Asia & Pacific	14.00	14.00	9.00	3.00	-99.00	NULL	0
11		Antarctica	10.00	10.00	4.00	-99.00	1.00	NULL	0
12	d Ne...	East Asia & Pacific	23.00	27.00	7.00	-99.00	-99.00	NULL	0
13	ope...	Sub-Saharan Africa	22.00	35.00	10.00	2.00	-99.00	NULL	0
14		Latin America & ...	17.00	19.00	6.00	4.00	1.00	NULL	0
15	d Ne...	East Asia & Pacific	9.00	9.00	4.00	-99.00	1.00	NULL	0
16	rope	Europe & Central...	7.00	7.00	5.00	-99.00	1.00	Italy,Hungary,Slo...	175681436
17	ia	Europe & Central...	10.00	10.00	4.00	-99.00	1.00	Georgia,Turkey,R...	290858866
18	ica	Sub-Saharan Africa	7.00	7.00	4.00	-99.00	1.00	Rwanda,Tanzani...	120214356
19	rope	Europe & Central...	7.00	7.00	5.00	-99.00	1.00	France,Netherla...	163595324
20	rica	Sub-Saharan Africa	5.00	5.00	5.00	-99.00	1.00	Nigeria,Niger,Bur...	186301451
21	rica	Sub-Saharan Africa	12.00	12.00	4.00	-99.00	1.00	Mali,Niger,Ghana...	87234511
22	sia	South Asia	10.00	10.00	5.00	-99.00	1.00	India,Myanmar	1214216958

Show All Features

■■■■ ■■ ■■■■■■■■■■. ■■■■ ■■ ■■■■ ■ ■■■■■■.

```
#####
# Copyright 2014 Ujaval Gandhi
#
#This program is free software; you can redistribute it and/or
#modify it under the terms of the GNU General Public License
#as published by the Free Software Foundation; either version 2
#of the License, or (at your option) any later version.
#
#This program is distributed in the hope that it will be useful,
#but WITHOUT ANY WARRANTY; without even the implied warranty of
#MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
#GNU General Public License for more details.
#
#You should have received a copy of the GNU General Public License
#along with this program; if not, write to the Free Software
#Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.
#
#####
from qgis.utils import iface
from PyQt4.QtCore import QVariant

# Replace the values below with values from your layer.
# For example, if your identifier field is called 'XYZ', then change the line
# below to _NAME_FIELD = 'XYZ'
```

```

_NAME_FIELD = 'NAME'
# Replace the value below with the field name that you want to sum up.
# For example, if the # field that you want to sum up is called 'VALUES', then
# change the line below to _SUM_FIELD = 'VALUES'
_SUM_FIELD = 'POP_EST'

# Names of the new fields to be added to the layer
_NEW_NEIGHBORS_FIELD = 'NEIGHBORS'
_NEW_SUM_FIELD = 'SUM'

layer = iface.activeLayer()

# Create 2 new fields in the layer that will hold the list of neighbors and sum
# of the chosen field.
layer.startEditing()
layer.dataProvider().addAttributes(
    [QgsField(_NEW_NEIGHBORS_FIELD, QVariant.String),
     QgsField(_NEW_SUM_FIELD, QVariant.Int)])
layer.updateFields()
# Create a dictionary of all features
feature_dict = {f.id(): f for f in layer.getFeatures()}

# Build a spatial index
index = QgsSpatialIndex()
for f in feature_dict.values():
    index.insertFeature(f)

# Loop through all features and find features that touch each feature
for f in feature_dict.values():
    print 'Working on %s' % f[_NAME_FIELD]
    geom = f.geometry()
    # Find all features that intersect the bounding box of the current feature.
    # We use spatial index to find the features intersecting the bounding box
    # of the current feature. This will narrow down the features that we need
    # to check neighboring features.
    intersecting_ids = index.intersects(geom.boundingBox())
    # Initialize neighbors list and sum
    neighbors = []
    neighbors_sum = 0
    for intersecting_id in intersecting_ids:
        # Look up the feature from the dictionary
        intersecting_f = feature_dict[intersecting_id]

        # For our purpose we consider a feature as 'neighbor' if it touches or
        # intersects a feature. We use the 'disjoint' predicate to satisfy
        # these conditions. So if a feature is not disjoint, it is a neighbor.
        if (f != intersecting_f and
            not intersecting_f.geometry().disjoint(geom)):
            neighbors.append(intersecting_f[_NAME_FIELD])
            neighbors_sum += intersecting_f[_SUM_FIELD]
    f[_NEW_NEIGHBORS_FIELD] = ','.join(neighbors)
    f[_NEW_SUM_FIELD] = neighbors_sum
    # Update the layer with new attribute values.
    layer.updateFeature(f)

layer.commitChanges()
print 'Processing complete.'

```

