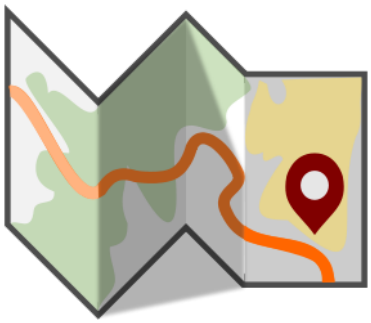
Find Neighbor Polygons in a Layer

QGIS Tutorials and Tips



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Trovare i poligoni confinanti in un layer

Si danno casi in cui avete bisogno di individuare tutti i poligoni confinanti con ciascuno dei poligoni presenti in un layer. Con un piccolo script in Python possiamo ottenere questo e molto d'altro in QGIS. Di seguito viene fornito l'esempio di uno script che potete usare per trovare tutti i poligoni che confinano con ognuno dei poligoni presenti in un layer e che inoltre vi permette di aggiungerli come nuove colonne nella tabella degli attributi. Come ulteriore premio, lo script vi permette anche di aggiungere un attributo a vostra scelta appartenente ai poligoni confinanti.

Descrizione del compito

Per fornire una dimostrazione di come lavorano gli script useremo un layer poligonale dei paesi e troveremo i paesi confinanti. Intendiamo anche calcolare la popolazione totale dei paesi vicini.

Ottenere i dati necessari

Dai dataset di Natural Earth useremo lo shapefile Admin 0 - Countries

Scarichiamo il file Admin 0 - countries shapefile..

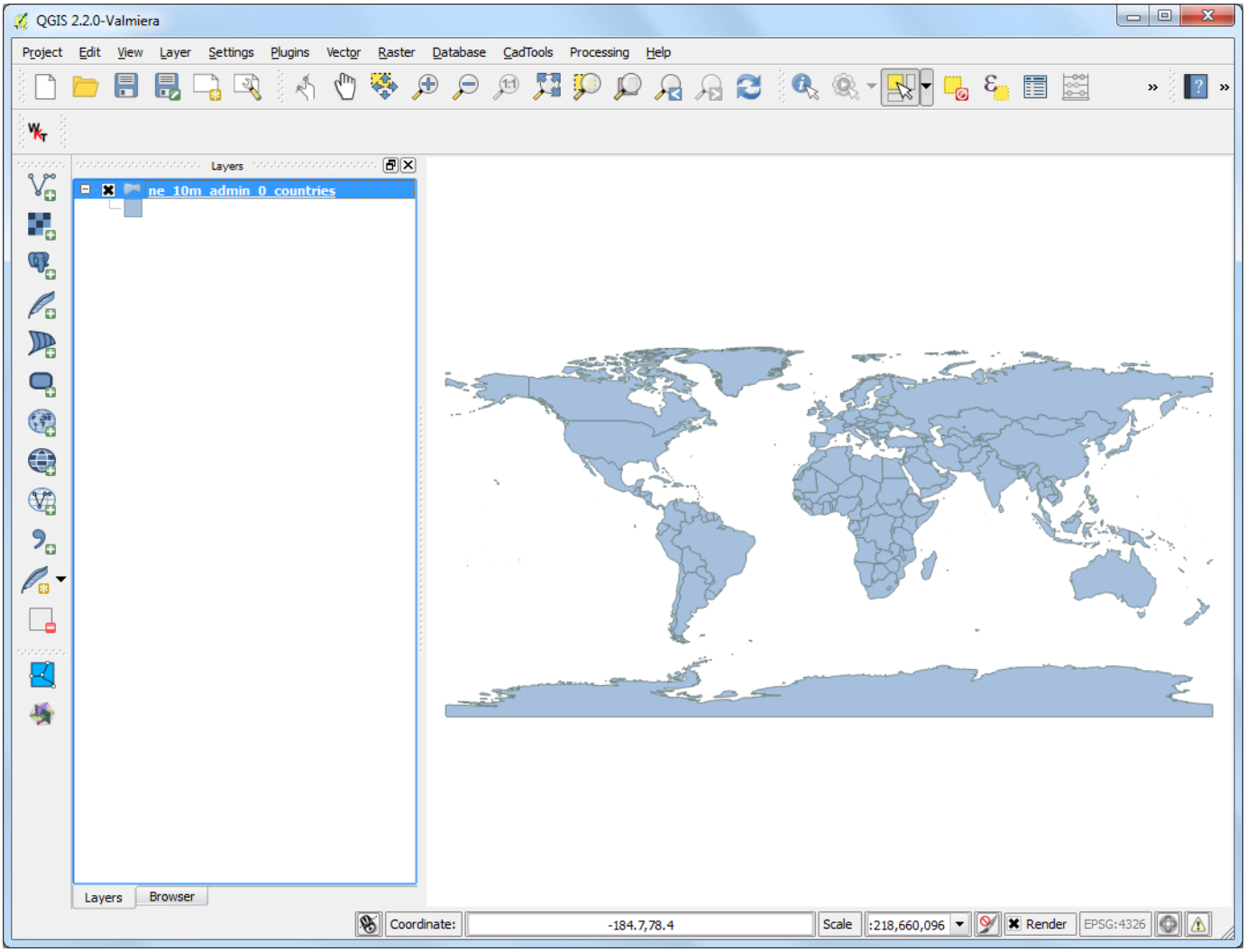
Fonte Dati [NATURALEARTH]

Scaricare lo script

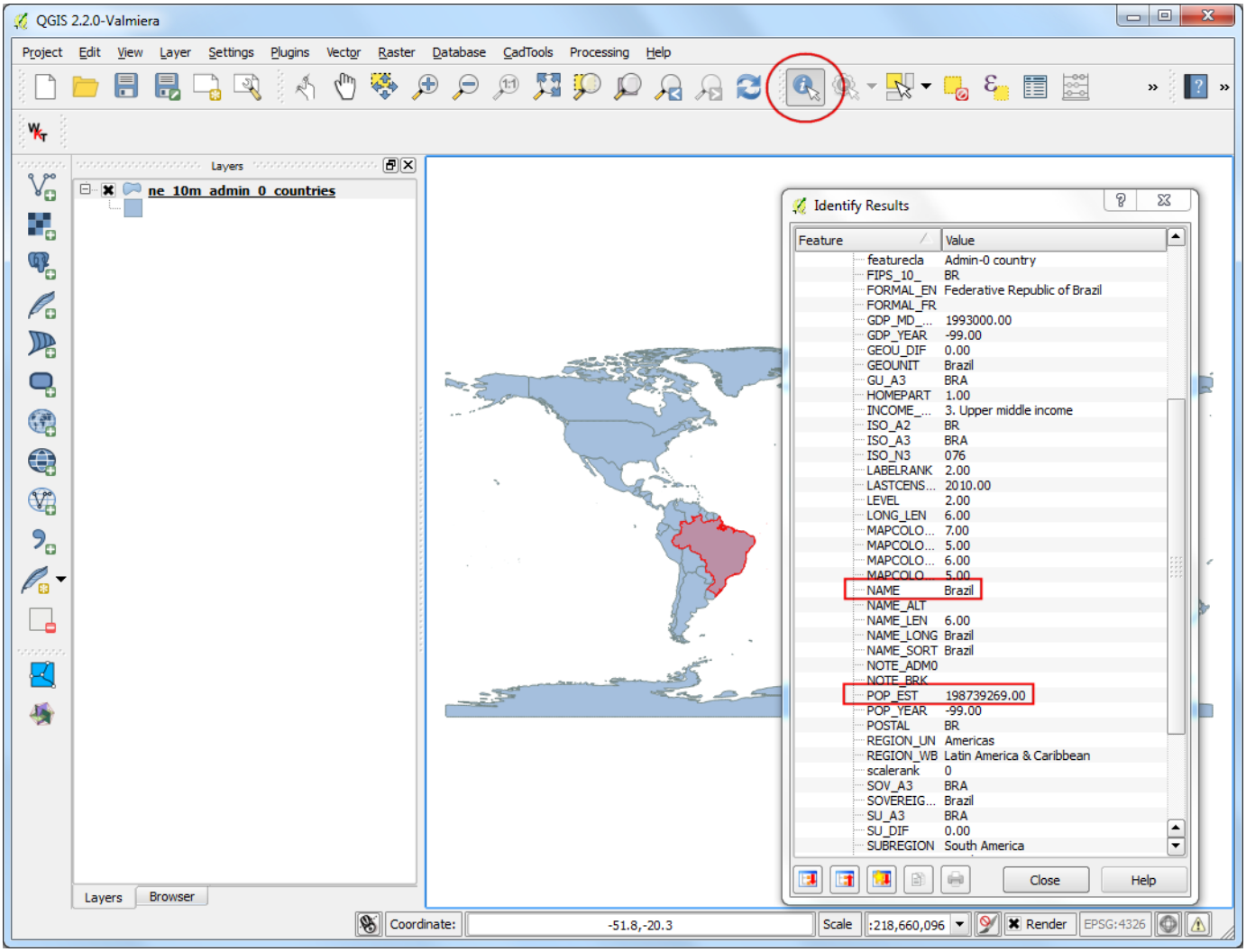
Scaricate il **`neighbors.py script`** e salvatelo sul vostro supporto di memoria di massa (hard dick, pen drive etc.).

Procedimento

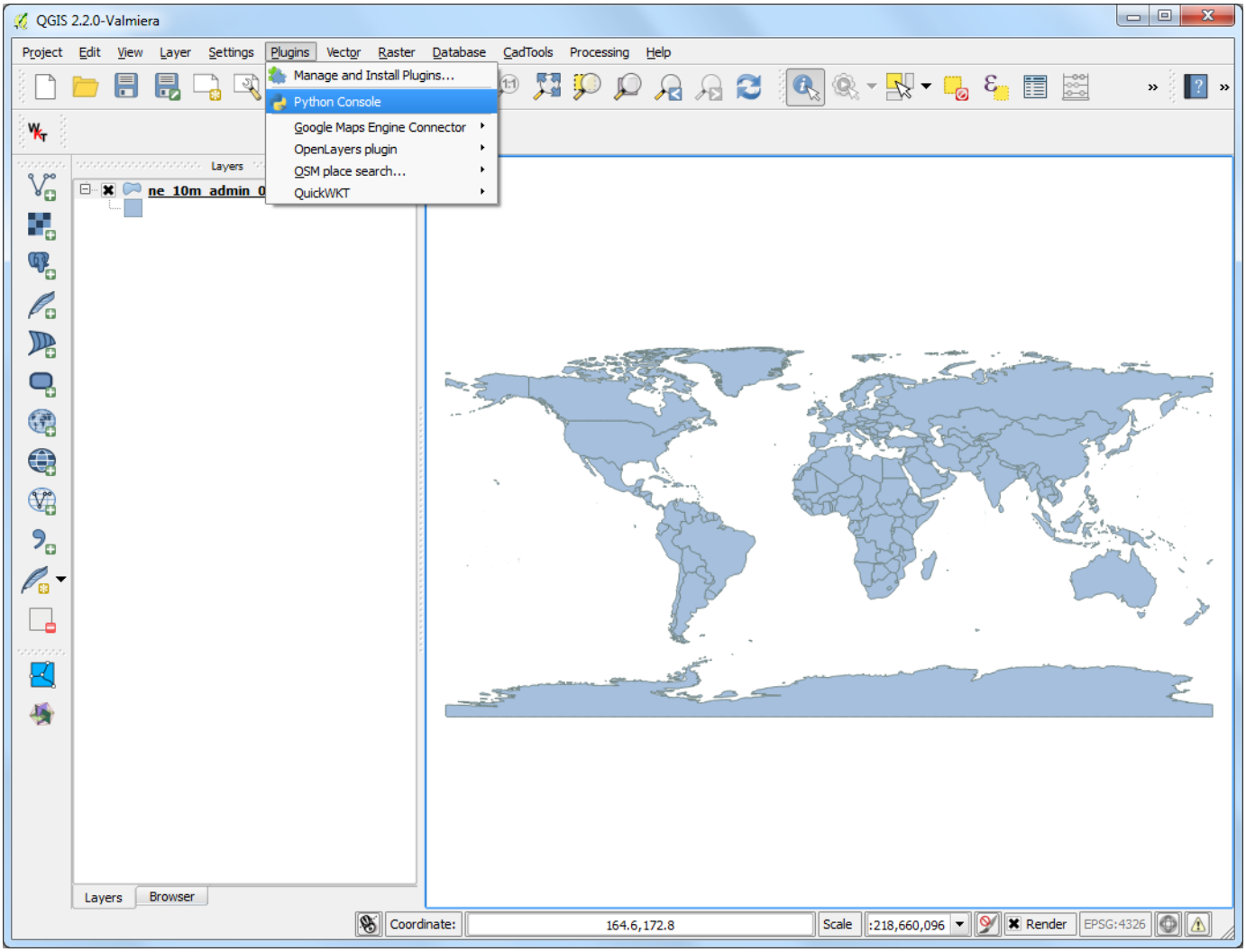
1. Caricate lo shapefile `ne_10m_admin_0_countries` layer andando su *Layer* ■ *Aggiungi Vettore*.



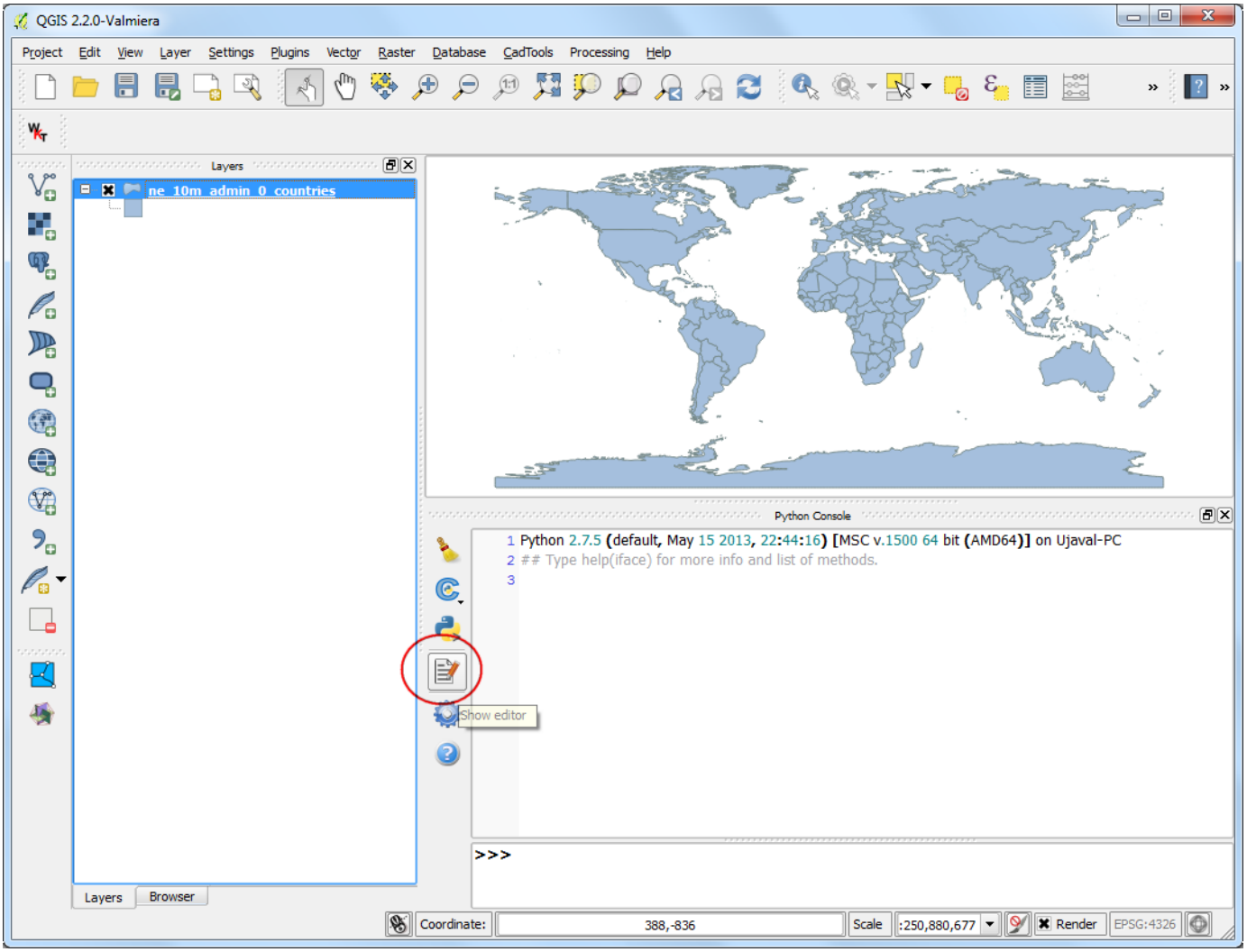
2. Lo script adotta due campi per realizzare la propria azione. Un campo nome e un campo che noi abbiamo deciso di aggiungere. Usate lo strumento identifica elemento per fare click su una qualsiasi delle geometrie e quindi esaminare gli attributi. In questo caso il campo nome è NAME e noi vogliamo aggiungere la somma della popolazione stimata nei paesi confinanti con il campo POP_EST.



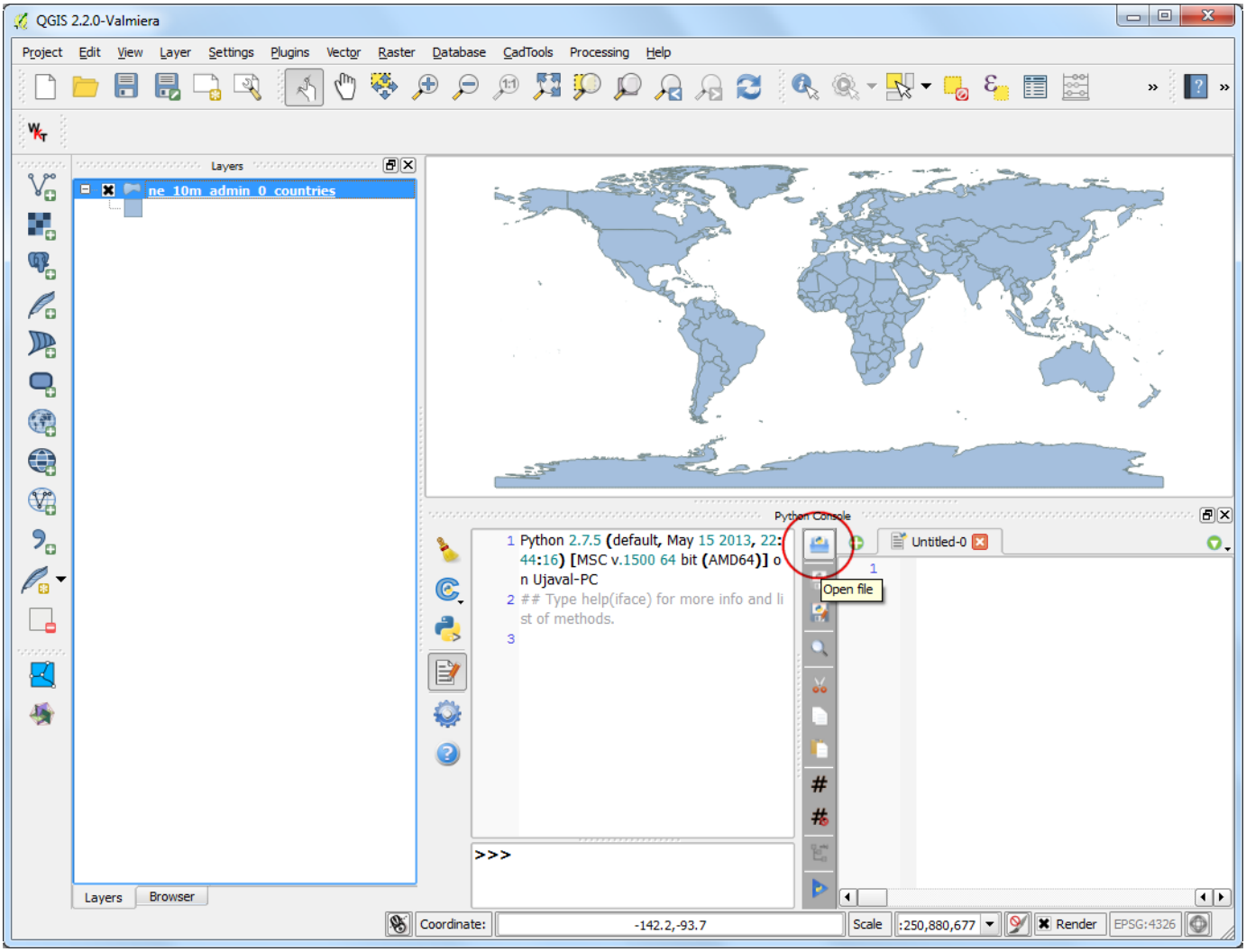
3. Andate su *Plugins* ■ *Console python*.



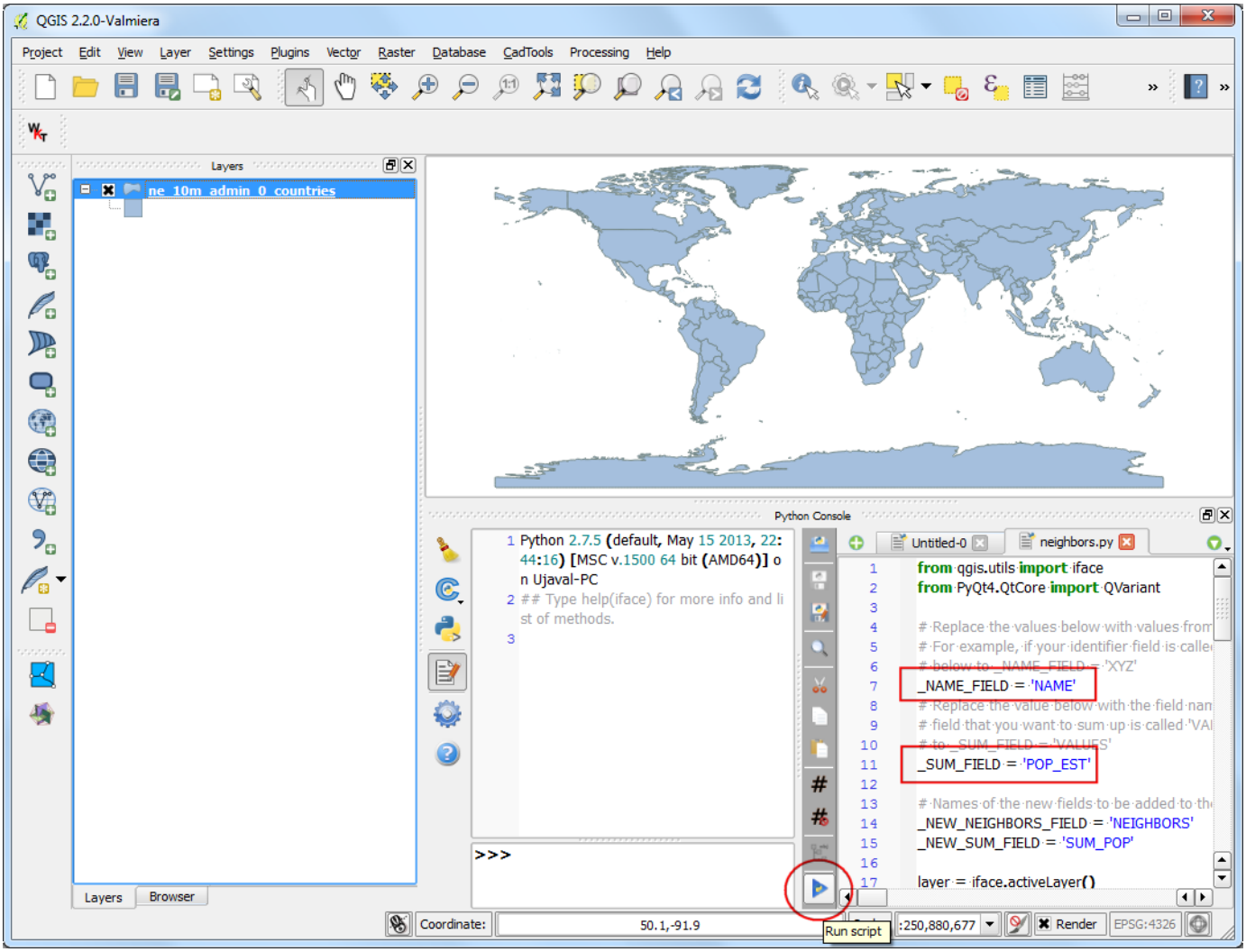
4. nella finestra *Console Python* fate click sul pulsante *Mostra Editor*.



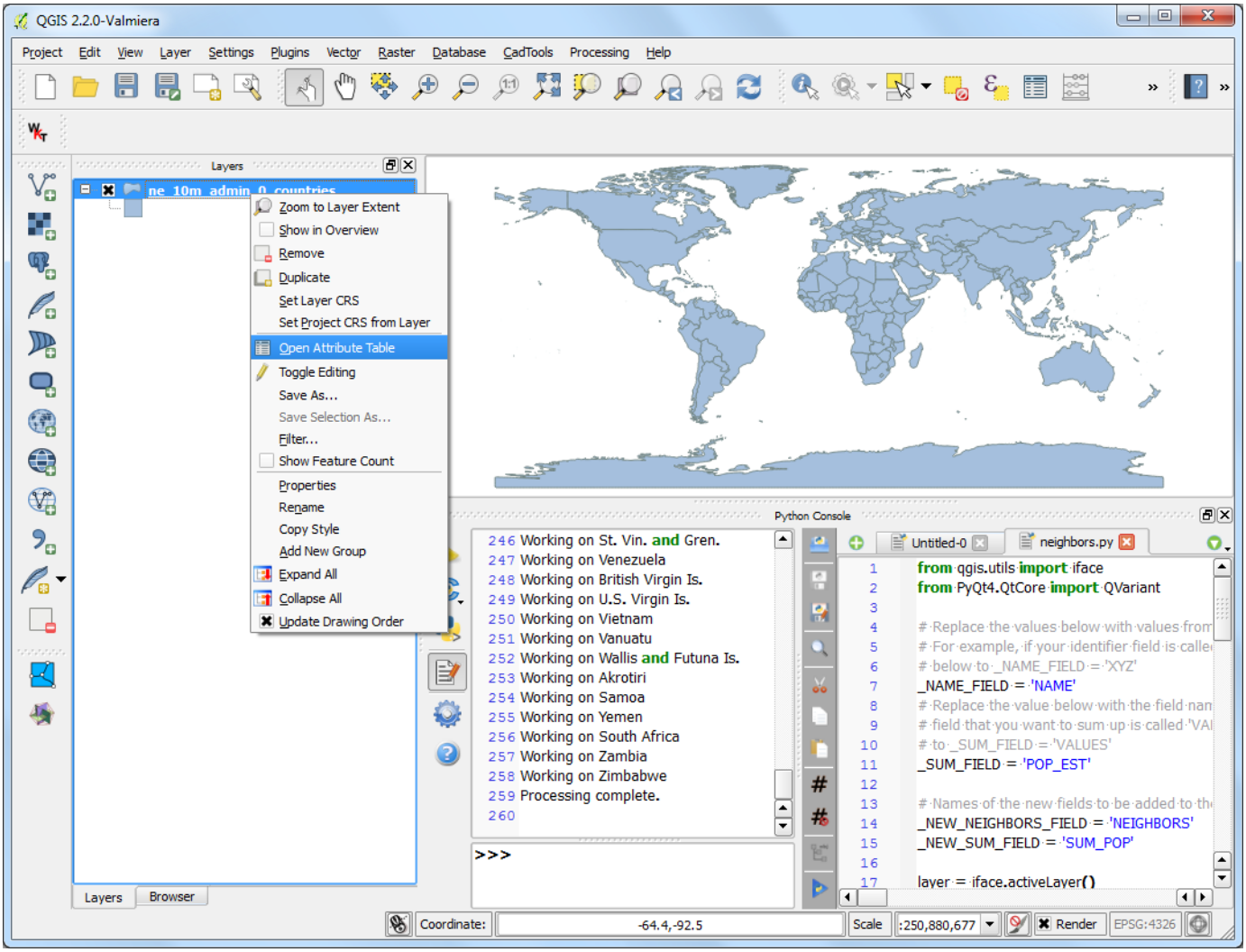
5. Nel pannello *Editor*, fate click sul pulsante *Apri file* e individuate lo script he avete scaricato poco fa e che si chiama ``neighbors.py` fate click su *Apri*.



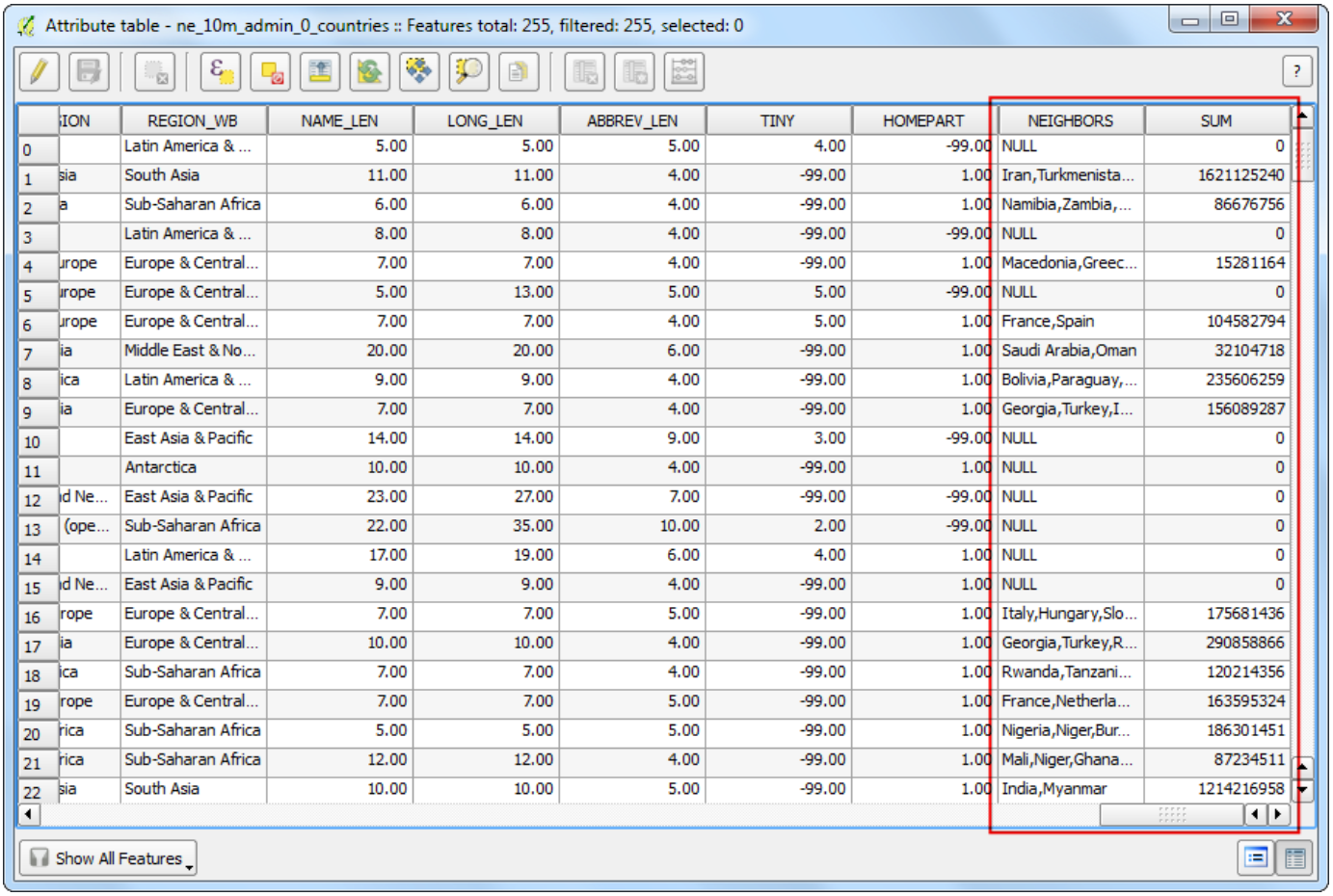
6. Una volta che lo script è stato caricato, potreste decidere di cambiare le intestazioni del `_NAME_FIELD` e quelle del `_SUM_FIELD` in modo che corrispondano con con quelle presenti sul vostro layer. Ma se state lavorando sul `ne_10m_admin_0_countries` potete lasciare le cose esattamente come sono. Fate click sul pulsante *Salva* all'interno dell'*Editor* se effettuate dei cambiamenti. Adesso fate click sul pulsante *Esegui script* per eseguire lo script.



7. Una volta che lo script termina il suo lavoro, fate click col tasto destro sul layer `ne_10m_admin_0_countries` e selezionate *Apri tabella degli attributi*.



8. Potrete notare 2 nuovi attribiuti chiamati `NEIGHBORS` e `SUM`. Entrambe le colonne sono state aggiunte dallo script.



	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

Di seguito avete lo script completo a disposizione. Siete liberi di modificarlo per adattarlo alle vostre esigenze.

```
##############################################################################
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#
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#of the License, or (at your option) any later version.
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#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())
    # Initalize 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.'
```