

# Getting Started with Python Programming

## QGIS Tutorials and Tips



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QGIS는 오픈 소스 GIS 소프트웨어로 GIS를 사용하여 데이터를 시각화하고 분석하는 데 사용됩니다. QGIS는 GIS 데이터를 처리하고 분석하는 데 사용되는 소프트웨어입니다. QGIS는 GIS 데이터를 처리하고 분석하는 데 사용되는 소프트웨어입니다. QGIS (PyQGIS)는 GIS 데이터를 처리하고 분석하는 데 사용되는 소프트웨어입니다.

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Natural Earth의 Airports 데이터를 다운로드합니다.

`Airports shapefile <[http://www.naturalearthdata.com/http://www.naturalearthdata.com/download/10m/cultural/ne\\_10m\\_airports.zip](http://www.naturalearthdata.com/http://www.naturalearthdata.com/download/10m/cultural/ne_10m_airports.zip)>`\_□ □□□□ □□□□.

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1. QGIS□□ □□ □□□ --> □□□ □□ --> □□ □□□ □□ :menuselection: `Layers --> Add Vector Layer`□ □□□□. □□□□□ `ne\_10m\_airports.zip`□□□ □□ □□ :guilabel: `Open`□ □□□□. `ne\_10m\_airports.shp`□□□□ □□□□ □□ :guilabel: `OK`□ □□□□.



2. QGIS `ne\_10m\_airports` 数据集加载到 QGIS 中。



3. Click Identify tool to identify the airports. The Identify tool will display a list of airports. The list will include the airport name, IATA code, and other information.



4. QGIS 是一个开源的地理信息系统。它支持多种数据格式，并且可以通过 Python 脚本进行定制和扩展。在 QGIS 中，可以通过以下路径访问 Python 控制台：
- 菜单栏：Plugins --> Python Console
  - 工具栏：Python 图标
  - 窗口：Python Console





6. `dir()` returns a list of attributes and methods for the active layer. This list can be used to check the attributes and methods of the layer. `layer` is the name of the layer.

```
dir(layer)
```



7. `getFeatures()` returns a list of features. Each feature is a dictionary with keys for the feature's attributes and values for the attribute values. The first key is always 'id', which is the feature's unique identifier. The other keys are the names of the attributes. The values are the values of the attributes. For example, if a feature has attributes 'name' and 'population', the dictionary would look like this:

```
{
  'id': 1,
  'name': 'New York',
  'population': 20000000
}
```

```

for f in layer.getFeatures():
    print f
  
```





8. `f['name']` and `f['iata_code']` are attributes of the feature object `f`. `f['name']` returns the name of the airport and `f['iata_code']` returns the IATA code of the airport.

```
for f in layer.getFeatures():
    print f['name'], f['iata_code']
```



```

    geom = f.geometry()
    print geom.asPoint()

```

```

for f in layer.getFeatures():
    geom = f.geometry()
    print geom.asPoint()

```



10. `geom.x()` returns the x-coordinate of the point geometry.

```

for f in layer.getFeatures():
    geom = f.geometry()
    print geom.asPoint().x()

```



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0000, 00 000 000 000000 000 000 000000. ``%s`` 0 ``%f`` 000 000 000000  
0000 00000.

```

for f in layer.getFeatures():
    geom = f.geometry()
    print '%s, %s, %f, %f' % (f['name'], f['iata_code'],
        geom.asPoint().y(), geom.asPoint().x())

```



```
output_file = open('c:/Users/Ujaval/Desktop/airports.txt', 'w')
for f in layer.getFeatures():
    geom = f.geometry()
    line = '%s, %s, %f, %f\n' % (f['name'], f['iata_code'],
                                geom.asPoint().y(), geom.asPoint().x())
    unicode_line = line.encode('utf-8')
    output_file.write(unicode_line)
output_file.close()
```



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airports.txt - Notepad

File Edit Format View Help

Sahnawal, LUH, 30.850360, 75.957072  
Solapur, SSE, 17.625415, 75.933060  
Birsamunda, IXR, 23.317725, 85.323597  
Ahwaz, AWZ, 31.343159, 48.747107  
Gwalior, GWL, 26.285488, 78.217219  
Hodeidah Int'l, HOD, 14.755253, 42.971096  
Devi Ahilyabai Holkar Int'l, IDR, 22.727749, 75.809292  
Gandhinagar, ISK, 19.966021, 73.810567  
Chandigarh Int'l, IXC, 30.670725, 76.801726  
Aurangabad, IXU, 19.867297, 75.395843  
Faisalabad Int'l, LYP, 31.362744, 72.987819  
Omsk Tsentralny, OMS, 54.957648, 73.316360  
Novosibirsk Tolmachev, OVB, 55.009585, 82.667152  
Zaporozhye Int'l, OZH, 47.873264, 35.301873  
Simpang Tiga, PKU, 0.464601, 101.446569  
Rota Int'l, ROP, 14.171771, 145.243980  
Surgut, SGC, 61.340167, 73.408496  
Tiruchirappalli, TRZ, 10.760357, 78.708958  
Turbat Int'l, TUK, 25.988795, 63.027933  
Quetta Int'l, UET, 30.249043, 66.948731  
Zahedan Int'l, ZAH, 29.475294, 60.900709  
Abdul Rachman Saleh, MLG, -7.929980, 112.711419  
Barnaul, BAX, 53.363385, 83.550453  
Adampur, NULL, 31.432942, 75.758483  
Bareilly, NULL, 28.421809, 79.452003  
Dhamial, NULL, 33.561415, 73.032050  
Cheongju Int'l, CJJ, 36.722023, 127.495916  
Gwangju, KWJ, 35.140005, 126.810839  
Daegu Int'l, TAE, 35.899928, 128.637538  
Ulsan, USN, 35.592896, 129.355731  
Radin Inten II, TKG, -5.242567, 105.176060  
Allahabad, IXD, 25.443522, 81.731727  
Chelyabinsk, CEK, 55.297792, 61.512259  
Tainan, TNN, 22.950668, 120.209733  
Taichung, RMQ, 24.266656, 120.630704  
Rotterdam The Hague, RTM, 51.949130, 4.433844  
Voronezh-Chertovitskoye, VOZ, 51.812617, 39.225450  
Liverpool John Lennon, LPL, 53.336375, -2.858621  
Vishakapatnam, VTZ, 17.727958, 83.223522  
Sultan Hasanuddin Int'l, UPG, -5.058937, 119.545691  
Vava'u Int'l, VAV, -18.586006, -173.968094  
Newcastle Int'l, NCL, 55.037085, -1.710346  
Goloson Int'l, LCE, 15.745160, -86.851469