# 데이터 수집 (openAPI 활용)

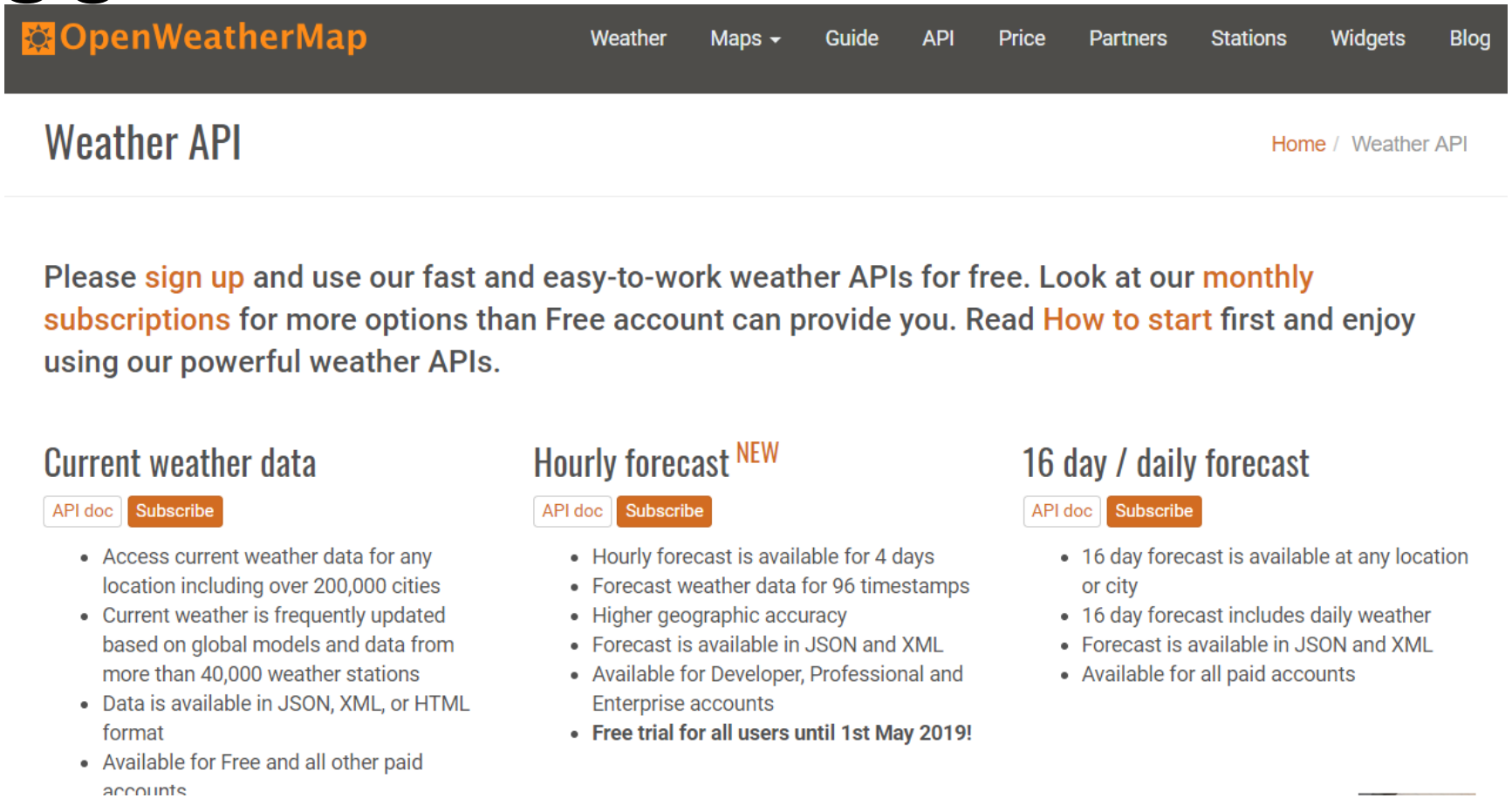
XML 및 JSON 자료 다루기

# 수업목표

- **데이터 수집 준비하기**
- Open API를 사용하기 위한 과정을 익힘
- Open API의 사용을 위한 요청과 응답 처리를 이해함
- 파이썬으로 Open API의 요청과 응답 처리를 프로그래밍 함

# 데이터 준비

- 계정 생성


OpenWeatherMap
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Maps
Guide
API
Price
Partners
Stations
Widgets
Blog
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Home / Weather API
Please sign up and use our fast and easy-to-work weather APIs for free. Look at our monthly subscriptions for more options than Free account can provide you. Read How to start first and enjoy using our powerful weather APIs.
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Current weather is frequently updated based on global models and data from more than 40,000 weather stations
Data is available in JSON, XML, or HTML format
Available for Free and all other paid accounts
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API doc
Subscribe
Hourly forecast is available for 4 days
Forecast weather data for 96 timestamps
Higher geographic accuracy
Forecast is available in JSON and XML
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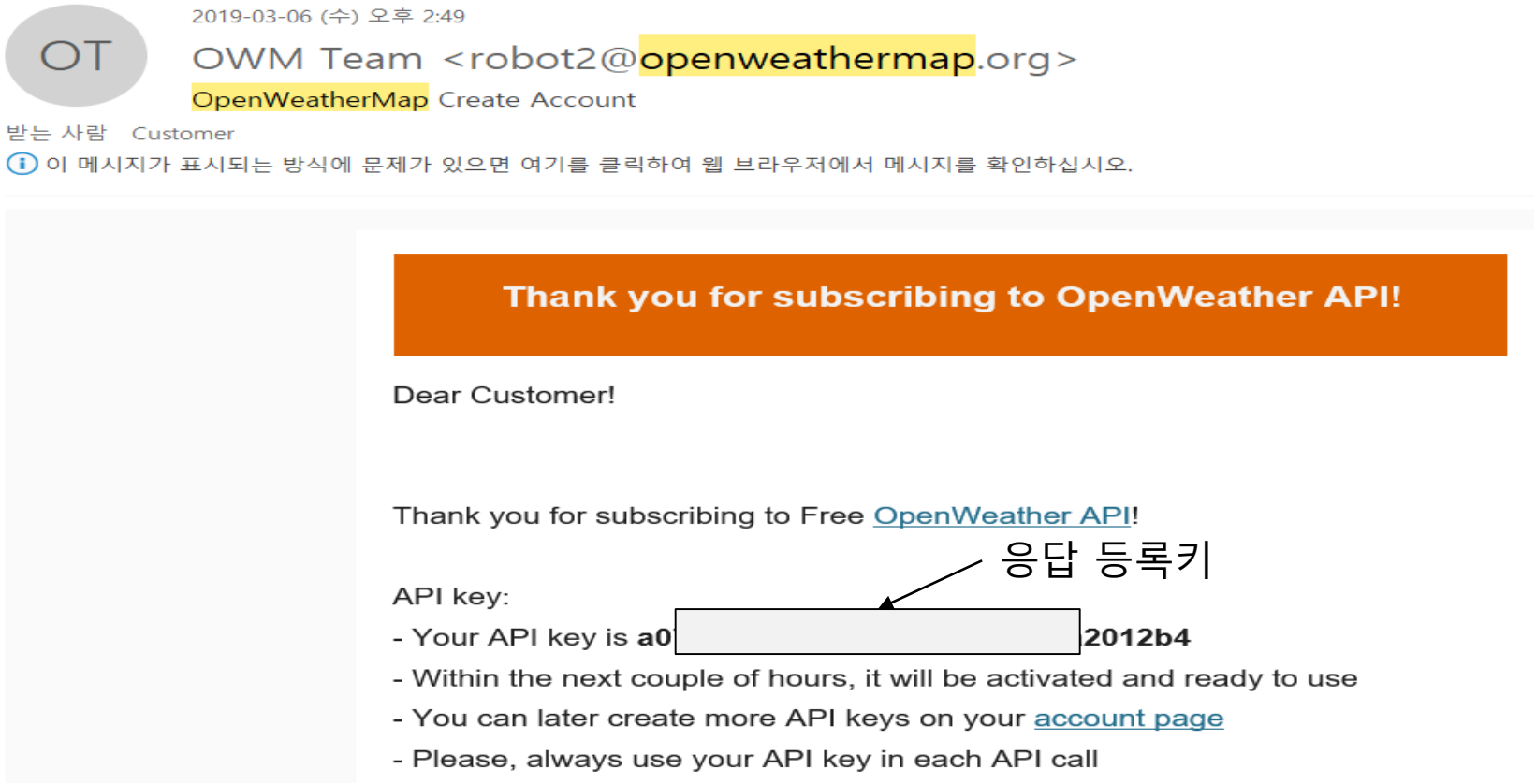
Free trial for all users until 1st May 2019!
16 day / daily forecast
API doc
Subscribe
16 day forecast is available at any location or city
16 day forecast includes daily weather
Forecast is available in JSON and XML
Available for all paid accounts

# 데이터 준비

- API 키 얻기



# 데이터 준비

- 도시 날씨 정보를 openweathermap에 요청함
  - (사전작업) 요청을 위해 id를 얻어야 함

요청

http://api.openweathermap.org/data/2.5/weather?q=Seoul&appid=등록id

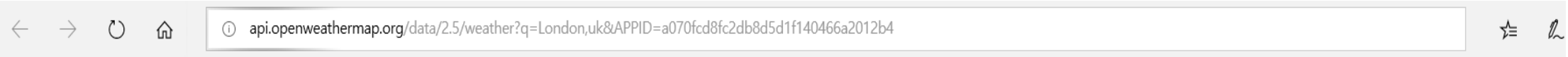
응답

{"coord":{"lon":126.98,"lat":37.57},"weather":[{"id":501,"main":"Rain","description":"moderate rain","icon":"10n"},
{"id":701,"main":"Mist","description":"mist","icon":"50n"}],"base":"stations","main":
{"temp":277.91,"pressure":1014,"humidity":93,"temp_min":276.15,"temp_max":279.15},"visibility":6000,"wind":
{"speed":2.6,"deg":10,"gust":6.2},"rain":{"1h":1.78},"clouds":{"all":90},"dt":1554817200,"sys":
{"type":1,"id":5509,"message":0.0044,"country":"KR","sunrise":1554757599,"sunset":1554804038},"id":1835848,"name":"Seoul","cod":200}

# 데이터 수집

- 특정 도시에 날씨정보 요청 및 응답

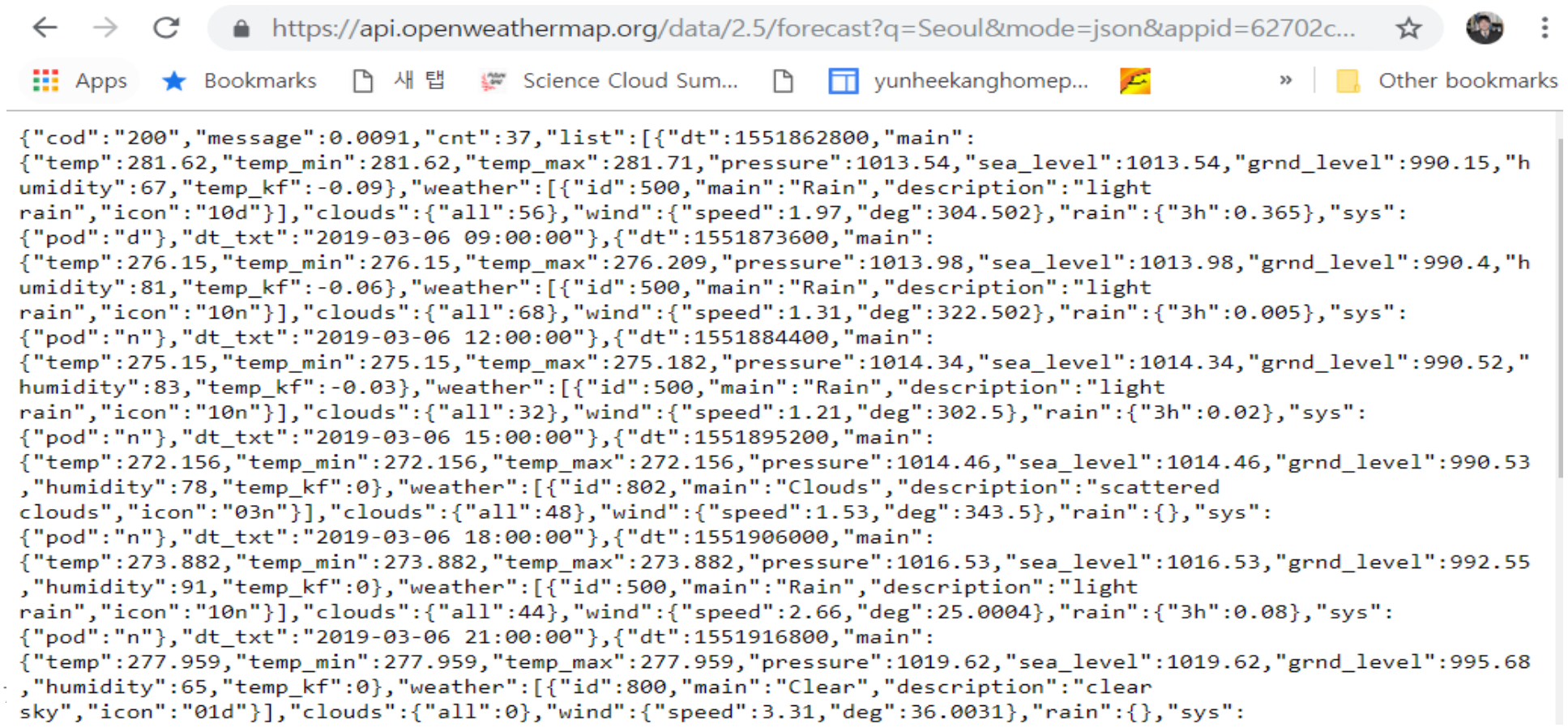
http:// api.openweathermap.org/data/2.5/weather?q=London,uk&APPID=키값




{"coord":{"lon":-0.13,"lat":51.51},"weather":[{"id":500,"main":"Rain","description":"light rain","icon":"10n"}],"base":"stations","main":
{"temp":281.06,"pressure":1019,"humidity":70,"temp_min":279.82,"temp_max":282.15},"visibility":10000,"wind":{"speed":7.7,"deg":210},"rain":{"1h":0.47},"clouds":{"all":92},"dt":1552354237,"sys":
{"type":1,"id":1414,"message":0.019,"country":"GB","sunrise":1552371725,"sunset":1552413568},"id":2643743,"name":"London","cod":200}

# 데이터 수집

https://api.openweathermap.org/data/2.5/forecast?q=Seoul&mode=json&appid=키값





```
{"cod":"200","message":0.0091,"cnt":37,"list":[{"dt":1551862800,"main":
{"temp":281.62,"temp_min":281.62,"temp_max":281.71,"pressure":1013.54,"sea_level":1013.54,"grnd_level":990.15,"h
umidity":67,"temp_kf":-0.09},"weather":[{"id":500,"main":"Rain","description":"light
rain","icon":"10d"}],"clouds":{"all":56},"wind":{"speed":1.97,"deg":304.502},"rain":{"3h":0.365},"sys":
{"pod":"d"},"dt_txt":"2019-03-06 09:00:00"},{"dt":1551873600,"main":
{"temp":276.15,"temp_min":276.15,"temp_max":276.209,"pressure":1013.98,"sea_level":1013.98,"grnd_level":990.4,"h
umidity":81,"temp_kf":-0.06},"weather":[{"id":500,"main":"Rain","description":"light
rain","icon":"10n"}],"clouds":{"all":68},"wind":{"speed":1.31,"deg":322.502},"rain":{"3h":0.005},"sys":
{"pod":"n"},"dt_txt":"2019-03-06 12:00:00"},{"dt":1551884400,"main":
{"temp":275.15,"temp_min":275.15,"temp_max":275.182,"pressure":1014.34,"sea_level":1014.34,"grnd_level":990.52,"
humidity":83,"temp_kf":-0.03},"weather":[{"id":500,"main":"Rain","description":"light
rain","icon":"10n"}],"clouds":{"all":32},"wind":{"speed":1.21,"deg":302.5},"rain":{"3h":0.02},"sys":
{"pod":"n"},"dt_txt":"2019-03-06 15:00:00"},{"dt":1551895200,"main":
{"temp":272.156,"temp_min":272.156,"temp_max":272.156,"pressure":1014.46,"sea_level":1014.46,"grnd_level":990.53
,"humidity":78,"temp_kf":0},"weather":[{"id":802,"main":"Clouds","description":"scattered
clouds","icon":"03n"}],"clouds":{"all":48},"wind":{"speed":1.53,"deg":343.5},"rain":{},"sys":
{"pod":"n"},"dt_txt":"2019-03-06 18:00:00"},{"dt":1551906000,"main":
{"temp":273.882,"temp_min":273.882,"temp_max":273.882,"pressure":1016.53,"sea_level":1016.53,"grnd_level":992.55
,"humidity":91,"temp_kf":0},"weather":[{"id":500,"main":"Rain","description":"light
rain","icon":"10n"}],"clouds":{"all":44},"wind":{"speed":2.66,"deg":25.0004},"rain":{"3h":0.08},"sys":
{"pod":"n"},"dt_txt":"2019-03-06 21:00:00"},{"dt":1551916800,"main":
{"temp":277.959,"temp_min":277.959,"temp_max":277.959,"pressure":1019.62,"sea_level":1019.62,"grnd_level":995.68
,"humidity":65,"temp_kf":0},"weather":[{"id":800,"main":"Clear","description":"clear
sky","icon":"01d"}],"clouds":{"all":0},"wind":{"speed":3.31,"deg":36.0031},"rain":{},"sys":
```

# 데이터 수집

In [1]:
```
import requests
```

In [10]:
```
def search_city(city):

    API_KEY = 'a070fcd8fc2db8d5d1f140466a2012b4'  # initialize your key here
    # call API and convert response into Python dictionary

    url = f'http://api.openweathermap.org/data/2.5/weather?q={city}&APPID={API_KEY}'
    response = requests.get(url).json()


    # error like unknown city name, inavalid api key
    if response.get('cod') != 200:
        message = response.get('message', '')
        return f'Error getting temperature for {city.title()}. Error message = {message}'

    # get current temperature and convert it into Celsius
    current_temperature = response.get('main', {}).get('temp')
    if current_temperature:
        current_temperature_celsius = round(current_temperature - 273.15, 2)
        return f'Current temperature of {city.title()} is {current_temperature_celsius}'
    else:
        return f'Error getting temperature for {city.title()}'
```

In [11]:
```
result = search_city('Seoul')
```

In [12]:
```
result
```

Out[12]:
```
'Current temperature of Seoul is 3.51'
```

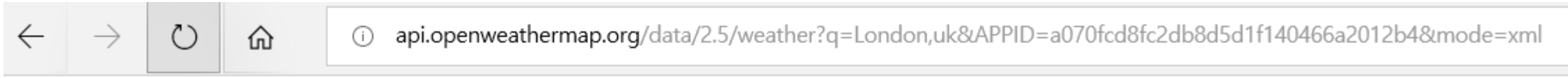
In [ ]:
```

```

# 데이터 수집

- 특정 도시에 날씨정보 요청 및 응답 (XML)

http://api.openweathermap.org/data/2.5/weather?q=London,uk&APPID=키값&mode=xml




```
<?xml version="1.0" encoding="ISO-8859-1"?>
- <current>
  - <city id="2643743" name="London">
      <coord lat="51.51" lon="-0.13"/>
      <country>GB</country>
      <sun set="2019-03-12T17:59:28" rise="2019-03-12T06:22:05"/>
    </city>
    <temperature unit="kelvin" max="282.15" min="279.82" value="281.06"/>
    <humidity unit="%" value="70"/>
    <pressure unit="hPa" value="1019"/>
  - <wind>
      <speed name="Moderate breeze" value="7.7"/>
      <gusts/>
      <direction name="South-southwest" value="210" code="SSW"/>
    </wind>
    <clouds name="overcast clouds" value="92"/>
```

# 데이터 수집

https://api.openweathermap.org/data/2.5/forecast?q=Seoul&mode=xml&appid=키값

This XML file does not appear to have any style information associated with it. The document tree is shown below.


```
<weatherdata>
  <location>
    <name>Seoul</name>
    <type/>
    <country>KR</country>
    <timezone/>
    <location altitude="0" latitude="37.5667" longitude="126.9783" geobase="geonames" geobaseid="1835848"/>
  </location>
  <credit/>
  <meta>
    <lastupdate/>
    <calctime>0.006</calctime>
    <nextupdate/>
  </meta>
  <sun rise="2019-03-05T21:57:09" set="2019-03-06T09:30:15"/>
  <forecast>
    <time from="2019-03-06T06:00:00" to="2019-03-06T09:00:00">
      <symbol number="500" name="light rain" var="10d"/>
      <precipitation unit="3h" value="0.365" type="rain"/>
      <windDirection deg="304.502" code="NW" name="Northwest"/>
      <windSpeed mps="1.97" name="Light breeze"/>
      <temperature unit="kelvin" value="281.62" min="281.62" max="281.71"/>
      <pressure unit="hPa" value="1013.54"/>
      <humidity value="67" unit="%"/>
      <clouds value="broken clouds" all="56" unit="%"/>
    </time>
    <time from="2019-03-06T09:00:00" to="2019-03-06T12:00:00">
      <symbol number="500" name="light rain" var="10n"/>
      <precipitation unit="3h" value="0.005" type="rain"/>
      <windDirection deg="322.502" code="NW" name="Northwest"/>
      <windSpeed mps="1.31" name="Calm"/>
      <temperature unit="kelvin" value="276.15" min="276.15" max="276.209"/>
      <pressure unit="hPa" value="1013.98"/>
      <humidity value="81" unit="%"/>
      <clouds value="broken clouds" all="68" unit="%"/>
    </time>
```

# 정리

- 정보서비스를 위해 openAPI 가 공공 및 민간 분야에서 활용되고 있음
- openAPI는 네트워크 상의 요청과 응답으로 이루어짐
- openAPI의 응답형식으로는 XML 과 JSON 이 활용되고 있음

- 다양한 분야에서 사용되는 openAPI를 조사하여 응용을 구성할 수 있음