REPORT

과목: 컴퓨터 네트워크

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제출일: 19. 09. 17

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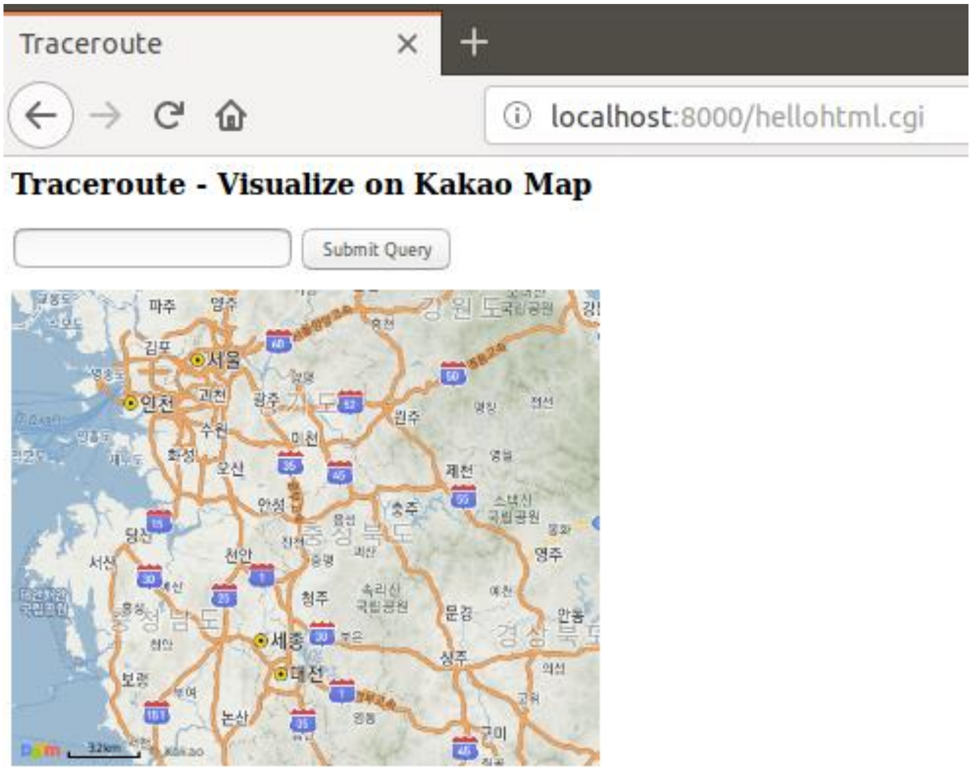
CHUNGNAM NATIONAL UNIVERSITY

결과화면

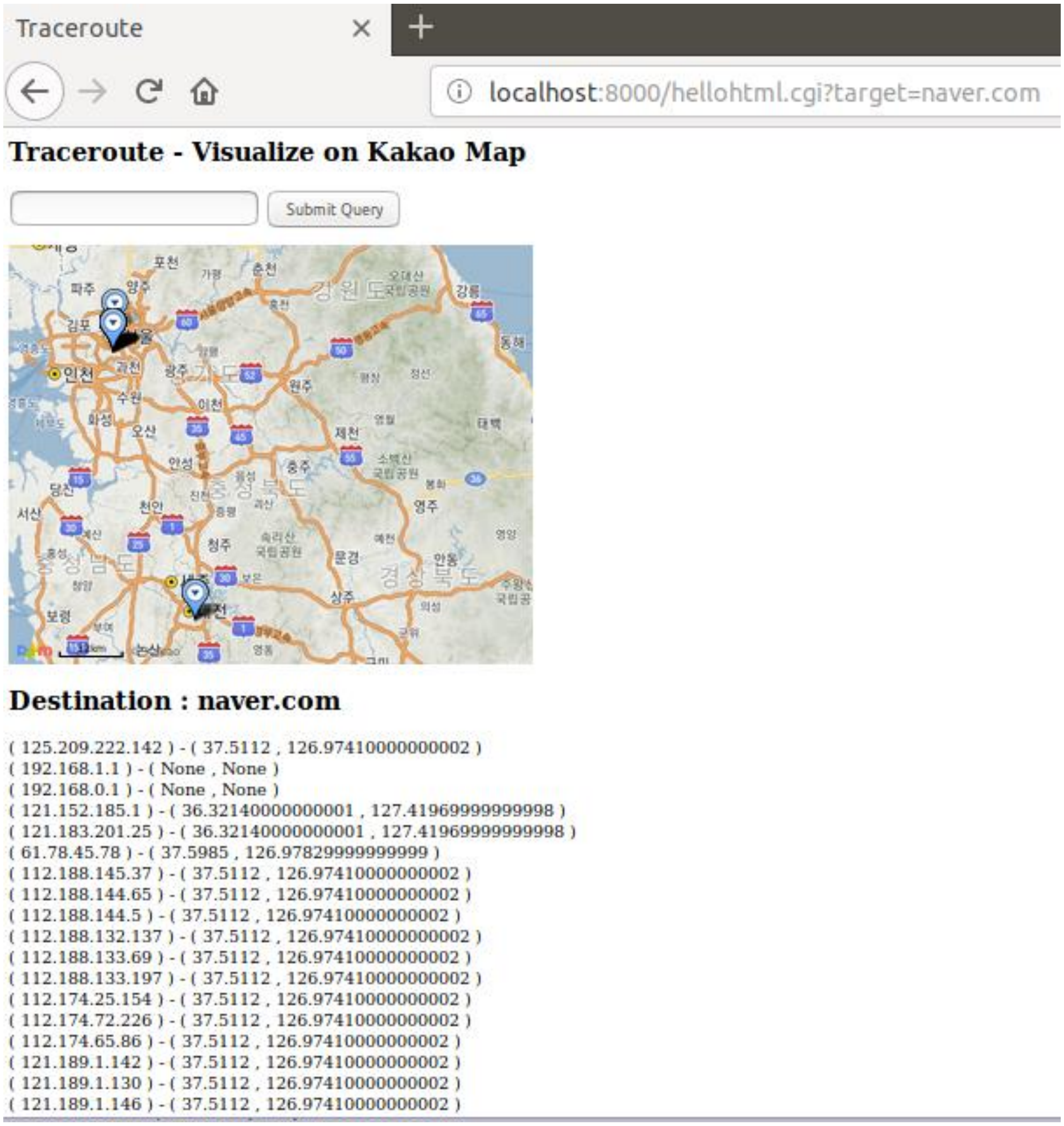
도메인 입력 전 화면



localhost:8000/hellohtml.cgi

Traceroute - Visualize on Kakao Map

- naver.com

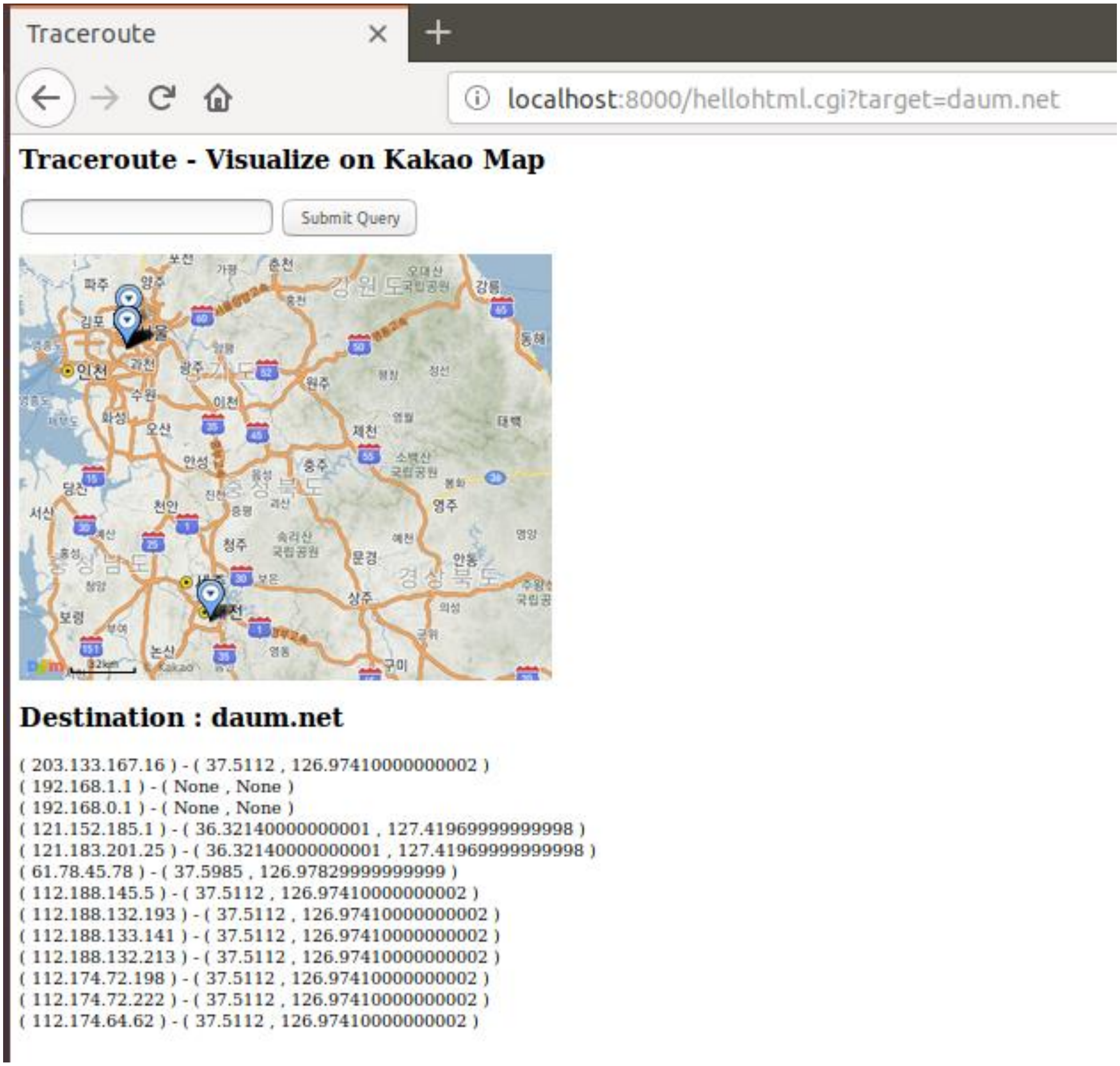


Traceroute - Visualize on Kakao Map

Destination : naver.com

```
( 125.209.222.142 ) - ( 37.5112 , 126.97410000000002 )
( 192.168.1.1 ) - ( None , None )
( 192.168.0.1 ) - ( None , None )
( 121.152.185.1 ) - ( 36.32140000000001 , 127.41969999999998 )
( 121.183.201.25 ) - ( 36.32140000000001 , 127.41969999999998 )
( 61.78.45.78 ) - ( 37.5985 , 126.97829999999999 )
( 112.188.145.37 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.144.65 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.144.5 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.132.137 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.69 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.197 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.25.154 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.72.226 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.65.86 ) - ( 37.5112 , 126.97410000000002 )
( 121.189.1.142 ) - ( 37.5112 , 126.97410000000002 )
( 121.189.1.130 ) - ( 37.5112 , 126.97410000000002 )
( 121.189.1.146 ) - ( 37.5112 , 126.97410000000002 )
```

- daum.net

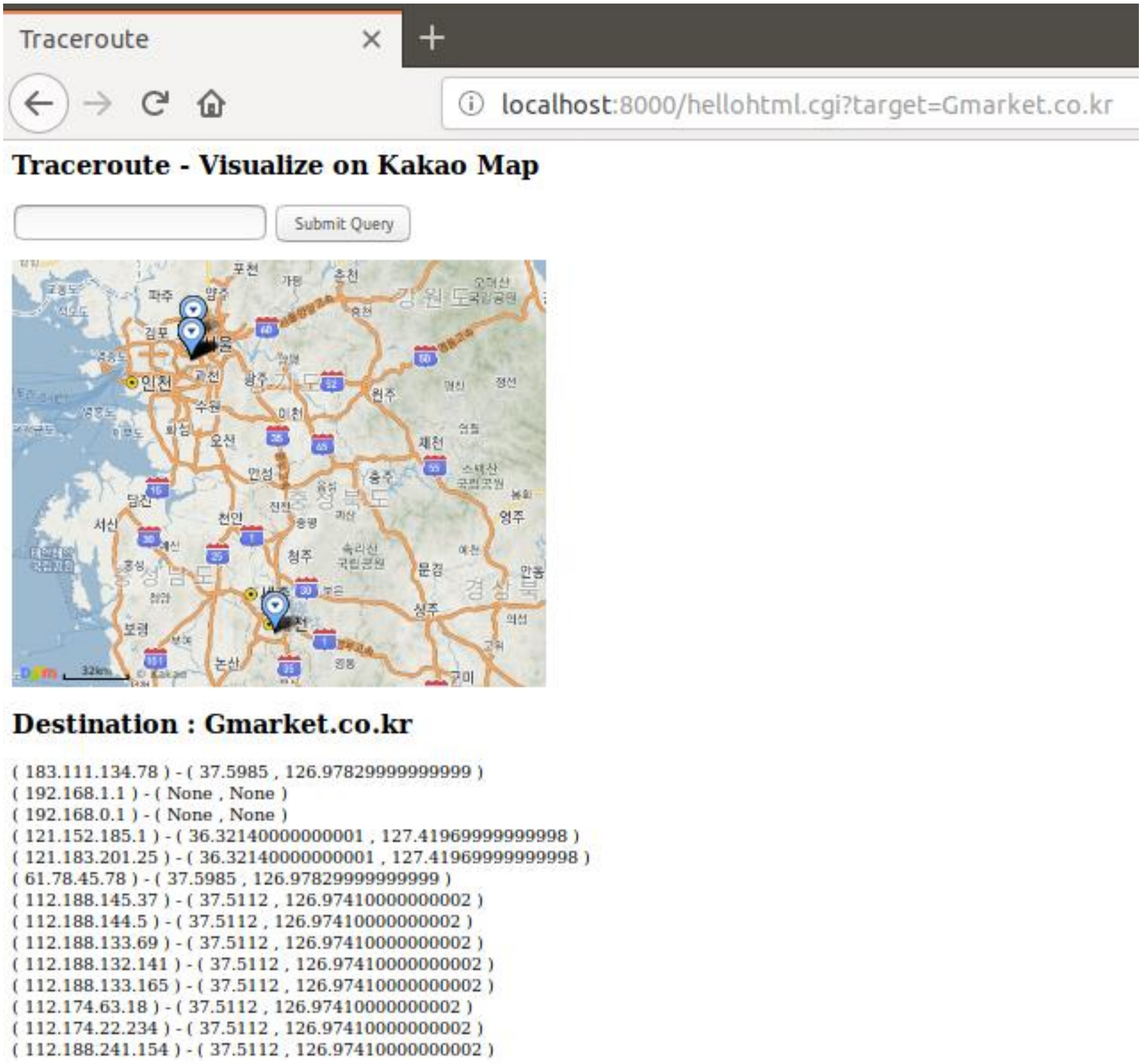


Traceroute - Visualize on Kakao Map

Destination : daum.net

```
( 203.133.167.16 ) - ( 37.5112 , 126.97410000000002 )
( 192.168.1.1 ) - ( None , None )
( 192.168.0.1 ) - ( None , None )
( 121.152.185.1 ) - ( 36.32140000000001 , 127.41969999999998 )
( 121.183.201.25 ) - ( 36.32140000000001 , 127.41969999999998 )
( 61.78.45.78 ) - ( 37.5985 , 126.97829999999999 )
( 112.188.145.5 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.132.193 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.141 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.132.213 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.72.198 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.72.222 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.64.62 ) - ( 37.5112 , 126.97410000000002 )
```

- Gmarket.co.kr

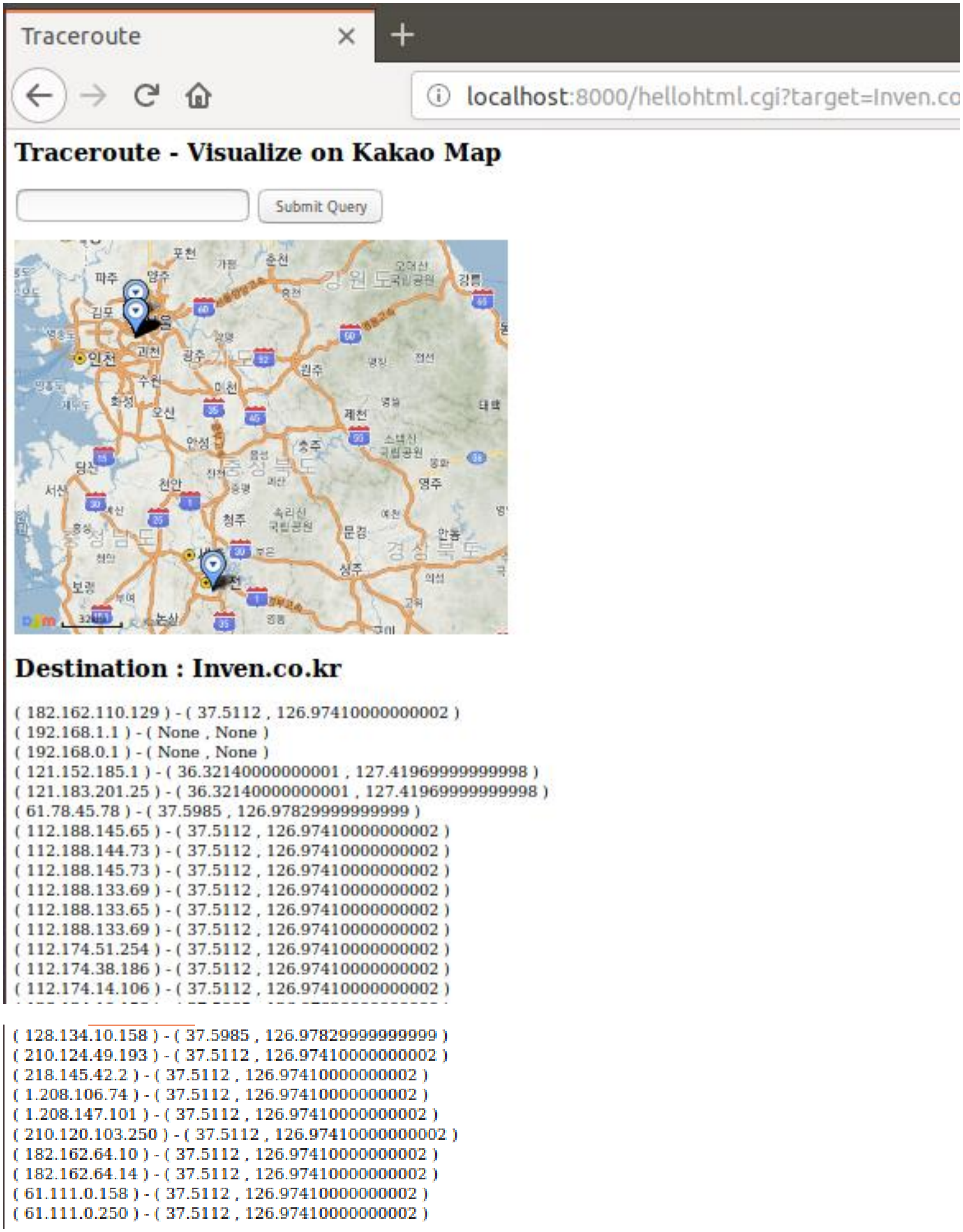


Traceroute - Visualize on Kakao Map

Destination : Gmarket.co.kr

```
( 183.111.134.78 ) - ( 37.5985 , 126.97829999999999 )
( 192.168.1.1 ) - ( None , None )
( 192.168.0.1 ) - ( None , None )
( 121.152.185.1 ) - ( 36.32140000000001 , 127.41969999999998 )
( 121.183.201.25 ) - ( 36.32140000000001 , 127.41969999999998 )
( 61.78.45.78 ) - ( 37.5985 , 126.97829999999999 )
( 112.188.145.37 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.144.5 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.69 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.132.141 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.165 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.63.18 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.22.234 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.241.154 ) - ( 37.5112 , 126.97410000000002 )
```

- Inven.co.kr

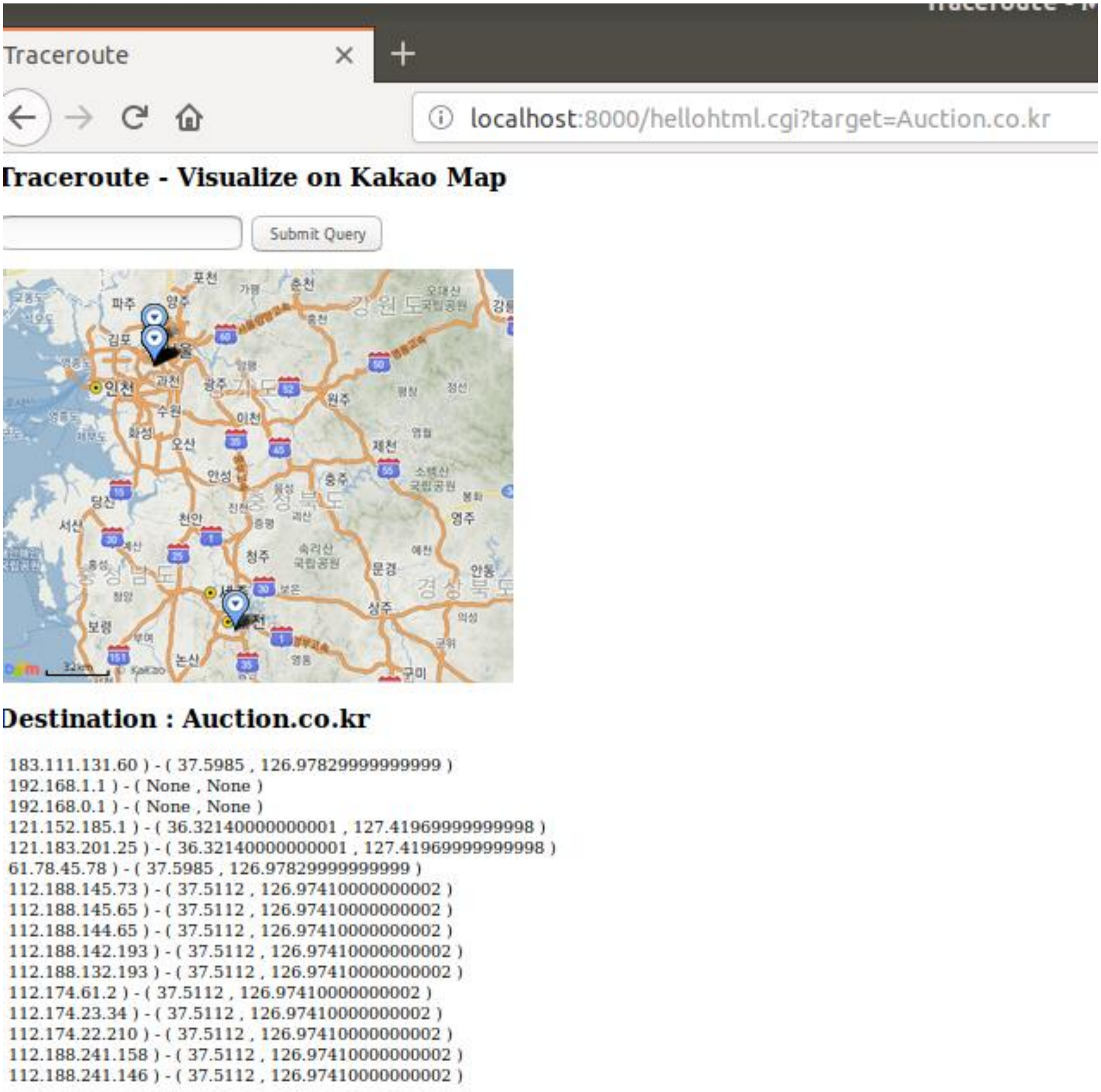


Traceroute - Visualize on Kakao Map

Destination : Inven.co.kr

```
( 182.162.110.129 ) - ( 37.5112 , 126.97410000000002 )
( 192.168.1.1 ) - ( None , None )
( 192.168.0.1 ) - ( None , None )
( 121.152.185.1 ) - ( 36.32140000000001 , 127.41969999999998 )
( 121.183.201.25 ) - ( 36.32140000000001 , 127.41969999999998 )
( 61.78.45.78 ) - ( 37.5985 , 126.97829999999999 )
( 112.188.145.65 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.144.73 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.145.73 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.69 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.65 ) - ( 37.5112 , 126.97410000000002 )
( 112.188.133.69 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.51.254 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.38.186 ) - ( 37.5112 , 126.97410000000002 )
( 112.174.14.106 ) - ( 37.5112 , 126.97410000000002 )
( 128.134.10.158 ) - ( 37.5985 , 126.97829999999999 )
( 210.124.49.193 ) - ( 37.5112 , 126.97410000000002 )
( 218.145.42.2 ) - ( 37.5112 , 126.97410000000002 )
( 1.208.106.74 ) - ( 37.5112 , 126.97410000000002 )
( 1.208.147.101 ) - ( 37.5112 , 126.97410000000002 )
( 210.120.103.250 ) - ( 37.5112 , 126.97410000000002 )
( 182.162.64.10 ) - ( 37.5112 , 126.97410000000002 )
( 182.162.64.14 ) - ( 37.5112 , 126.97410000000002 )
( 61.111.0.158 ) - ( 37.5112 , 126.97410000000002 )
( 61.111.0.250 ) - ( 37.5112 , 126.97410000000002 )
```

- Auction.co.kr



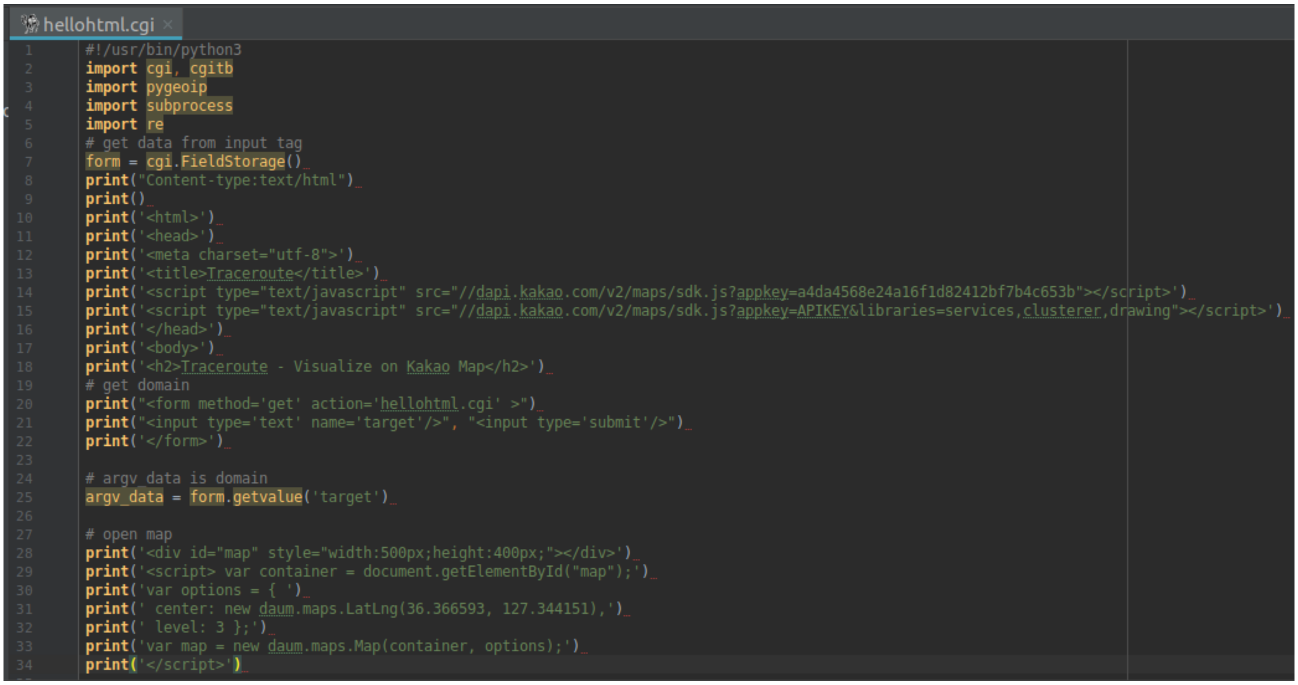
Traceroute - Visualize on Kakao Map

Destination : Auction.co.kr

```
183.111.131.60 ) - ( 37.5985 , 126.97829999999999 )
192.168.1.1 ) - ( None , None )
192.168.0.1 ) - ( None , None )
121.152.185.1 ) - ( 36.32140000000001 , 127.41969999999998 )
121.183.201.25 ) - ( 36.32140000000001 , 127.41969999999998 )
61.78.45.78 ) - ( 37.5985 , 126.97829999999999 )
112.188.145.73 ) - ( 37.5112 , 126.97410000000002 )
112.188.145.65 ) - ( 37.5112 , 126.97410000000002 )
112.188.144.65 ) - ( 37.5112 , 126.97410000000002 )
112.188.142.193 ) - ( 37.5112 , 126.97410000000002 )
112.188.132.193 ) - ( 37.5112 , 126.97410000000002 )
112.174.61.2 ) - ( 37.5112 , 126.97410000000002 )
112.174.23.34 ) - ( 37.5112 , 126.97410000000002 )
112.174.22.210 ) - ( 37.5112 , 126.97410000000002 )
112.188.241.158 ) - ( 37.5112 , 126.97410000000002 )
112.188.241.146 ) - ( 37.5112 , 126.97410000000002 )
```

과제 해결 방법

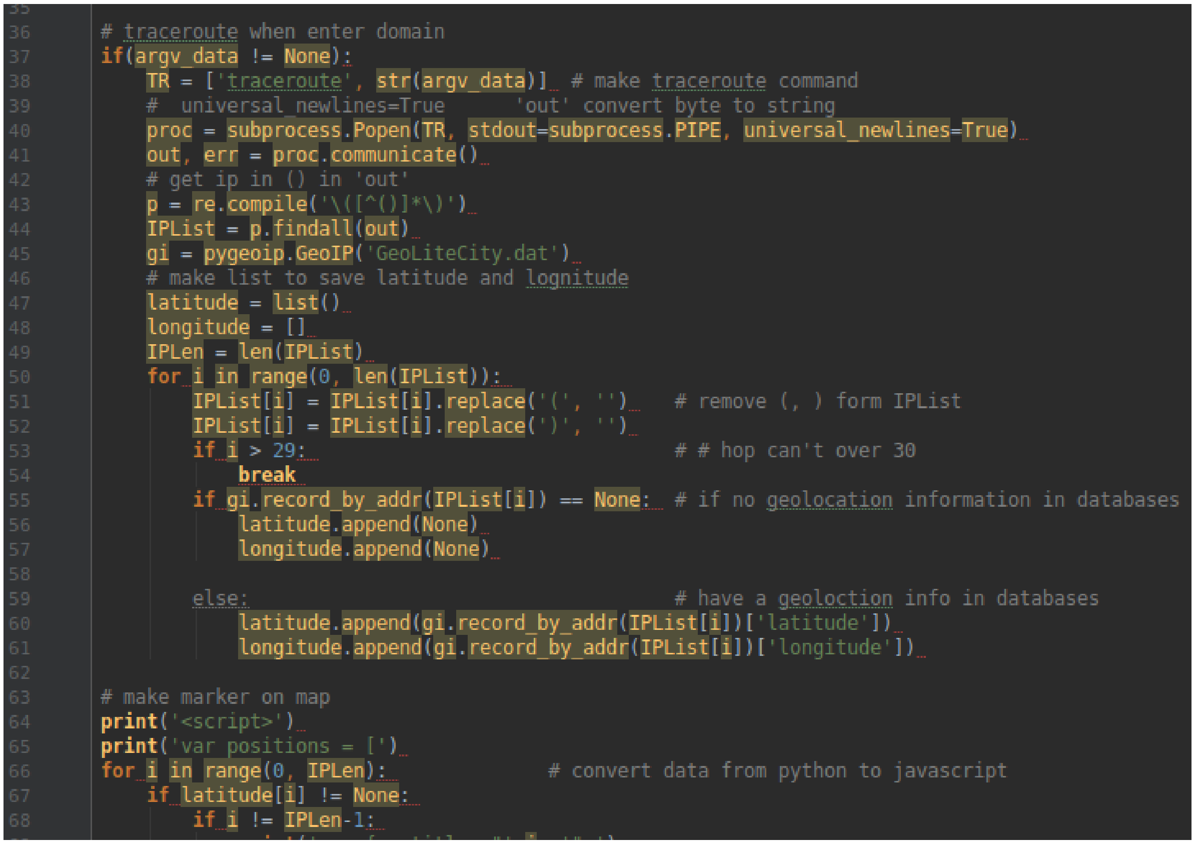
- hellohtml.cgi



```
#!/usr/bin/python3
import cgi, cgitb
import pygeoip
import subprocess
import re
# get data from input tag
form = cgi.FieldStorage()
print("Content-type:text/html")
print()
print('<html>')
print('<head>')
print('<meta charset="utf-8">')
print('<title>Traceroute</title>')
print('<script type="text/javascript" src="//dapi.kakao.com/v2/maps/sdk.js?appkey=a4da4568e24a16f1d82412bf7b4c653b"></script>')
print('<script type="text/javascript" src="//dapi.kakao.com/v2/maps/sdk.js?appkey=APIKEY&libraries=services,clusterer,drawing"></script>')
print('</head>')
print('<body>')
print('<h2>Traceroute - Visualize on Kakao Map</h2>')
# get domain
print("<form method='get' action='hellohtml.cgi' >")
print("<input type='text' name='target'/>", "<input type='submit'/>")
print('</form>')

# argv_data is domain
argv_data = form.getvalue('target')

# open map
print('<div id="map" style="width:500px;height:400px;"></div>')
print('<script> var container = document.getElementById("map");')
print('var options = { ')
print(' center: new daum.maps.LatLng(36.366593, 127.344151),')
print(' level: 3 };')
print('var map = new daum.maps.Map(container, options);')
print('</script>')
```

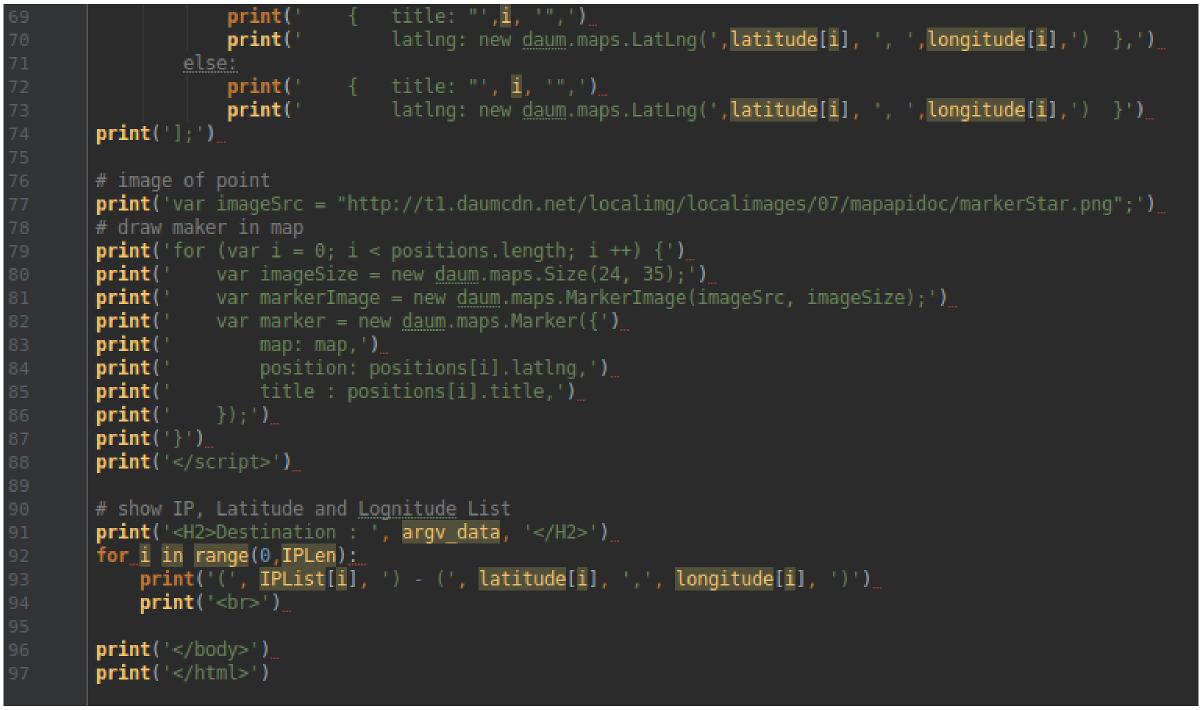


```

# traceroute when enter domain
if(argv_data != None):
    TR = ['traceroute', str(argv_data)] # make traceroute command
    #  universal_newlines=True      'out' convert byte to string
    proc = subprocess.Popen(TR, stdout=subprocess.PIPE, universal_newlines=True)
    out, err = proc.communicate()
    # get ip in () in 'out'
    p = re.compile('\([^()]*\)')
    IPList = p.findall(out)
    gi = pygeoip.GeoIP('GeoLiteCity.dat')
    # make list to save latitude and lognitude
    latitude = list()
    longitude = []
    IPLen = len(IPList)
    for i in range(0, len(IPList)):
        IPList[i] = IPList[i].replace('(', '')    # remove (, ) form IPList
        IPList[i] = IPList[i].replace(')', '')
        if i > 29:                                # # hop can't over 30
            break
        if gi.record_by_addr(IPList[i]) == None:  # if no geolocation information in databases
            latitude.append(None)
            longitude.append(None)

        else:                                     # have a geoloction info in databases
            latitude.append(gi.record_by_addr(IPList[i])['latitude'])
            longitude.append(gi.record_by_addr(IPList[i])['longitude'])

# make marker on map
print('<script>')
print('var positions = [')
for i in range(0, IPLen):              # convert data from python to javascript
    if latitude[i] != None:
        if i != IPLen-1:
```



```
            print('    {   title: "',i, '",')
            print('        latlng: new daum.maps.LatLng(',latitude[i], ', ',longitude[i],')  },')
        else:
            print('    {   title: "', i, '",')
            print('        latlng: new daum.maps.LatLng(',latitude[i], ', ',longitude[i],')  }')
print('];')

# image of point
print('var imageSrc = "http://t1.daumcdn.net/localimg/localimages/07/mapapidoc/markerStar.png";')
# draw maker in map
print('for (var i = 0; i < positions.length; i ++) {')
print('    var imageSize = new daum.maps.Size(24, 35);')
print('    var markerImage = new daum.maps.MarkerImage(imageSrc, imageSize);')
print('    var marker = new daum.maps.Marker({')
print('        map: map,')
print('        position: positions[i].latlng,')
print('        title : positions[i].title,')
print('    });')
print('}')
print('</script>')

# show IP, Latitude and Lognitude List
print('<H2>Destination : ', argv_data, '</H2>')
for i in range(0,IPLen):
    print('(', IPList[i], ') - (', latitude[i], ',', longitude[i], ')')
    print('<br>')

print('</body>')
print('</html>')
```

1. 마커가 없는 지도 화면을 띄운다.

2. 입력한 도메인이 저장된 argv_data가 비어 있지 않을 때만 traceroute를 실행한다.

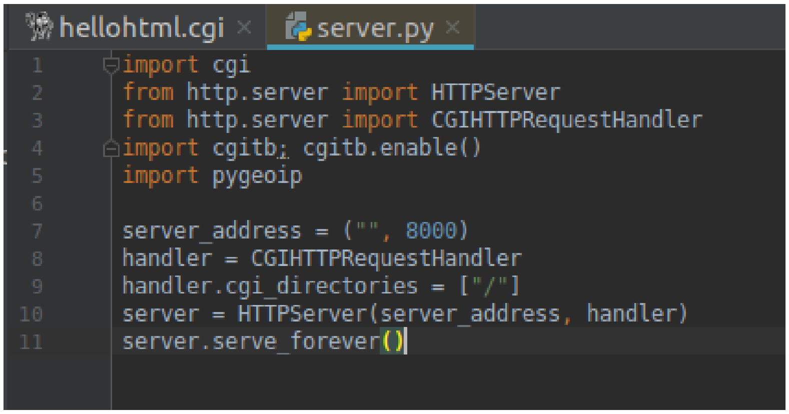
(traceroute과정 과제_01과 동일)

3. Maps API 중에서 마커 표시하기 기능을 이용하기 위해 파이썬에 담겨있던 IP, latitude, longitude List를 자바스크립트 데이터로 바꾼다.

4, 바꾼 데이터를 마커 표시기능으로 지도상에 표시한다.

5. IP와 위도, 경도를 텍스트로 출력한다.

- server.py



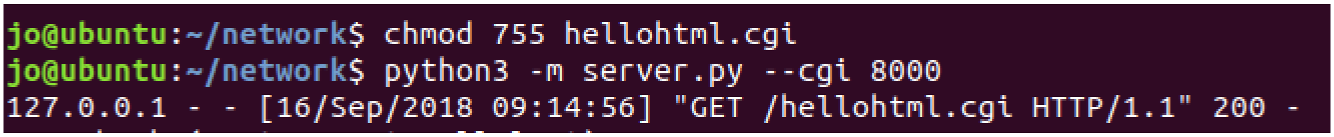
```
import cgi
from http.server import HTTPServer
from http.server import CGIHTTPRequestHandler
import cgitb; cgitb.enable()
import pygeoip

server_address = ("", 8000)
handler = CGIHTTPRequestHandler
handler.cgi_directories = ["/"]
server = HTTPServer(server_address, handler)
server.serve_forever()
```

cgitb 모듈로 각종 오류등을 전부 출력해준다.

8000번 포트를 통해 HTTP Daemon 서버를 만든다.

- 터미널 실행 창



```
jo@ubuntu:~/network$ chmod 755 hellohtml.cgi
jo@ubuntu:~/network$ python3 -m server.py --cgi 8000
127.0.0.1 - - [16/Sep/2018 09:14:56] "GET /hellohtml.cgi HTTP/1.1" 200 -
```

hellohtml.cgi 파일의 소유자에게 모든 권한을 준다.

m옵션을 통해 모듈의 위치를 인자로 받는다.

--cgi 옵션으로 cgi 웹 서버를 8000번 포트로 시작한다.

브라우져에서 get 요청을 한번 받은 결과이다.