上海外国语大学
SHANGHAI INTERNATIONAL STUDIES UNIVERSITY

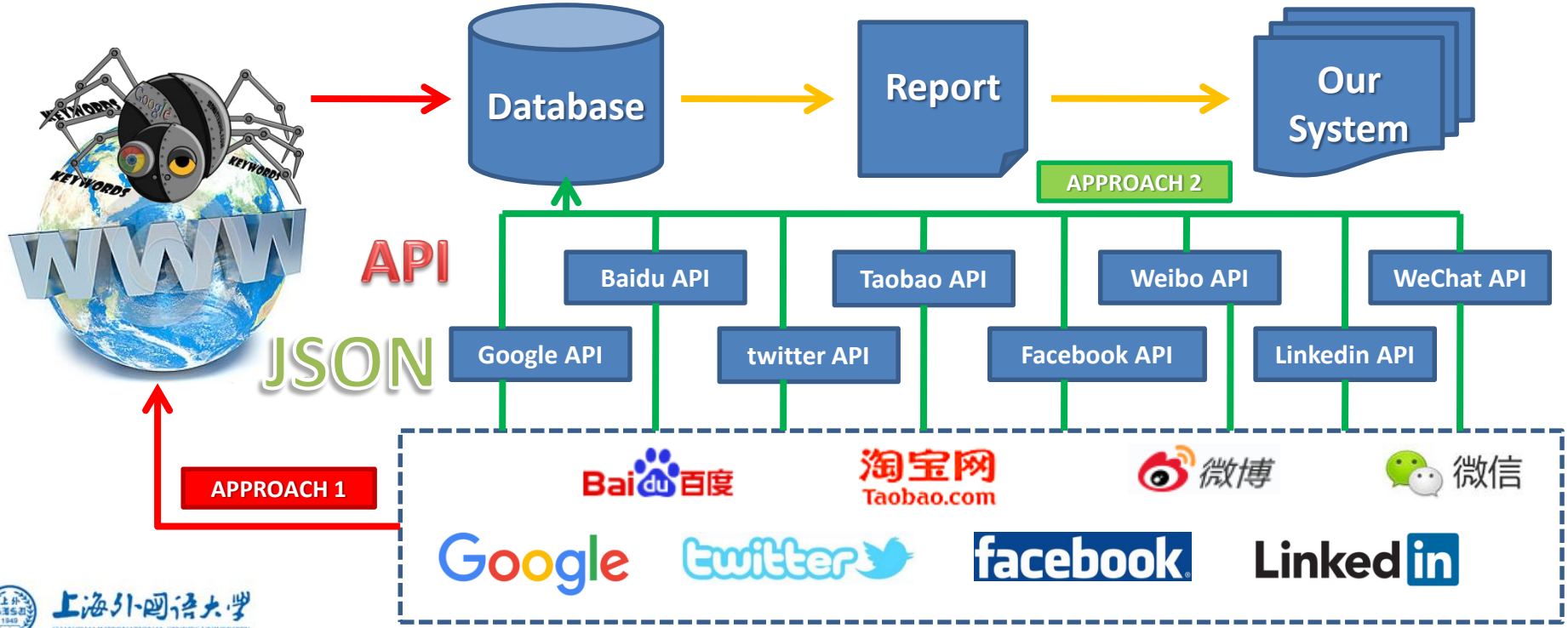
Computational Journalism

Lecture 4: Data Collection via Web API

Ting Wang

Objectives

How to get data from social media?



Outlines

- Web API
- JSON
- Examples of Web API Applications

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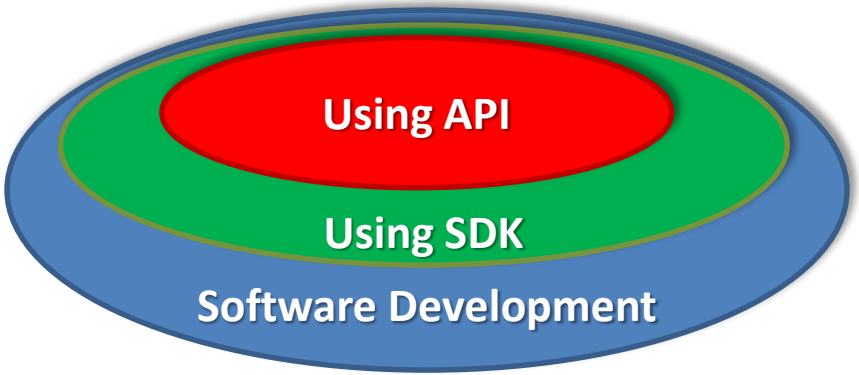
an access to the web site data

Web API

SDK (Software Development Kit)

软件开发工具包

a set of
- software development tools,
- source code,
- instructions,
- examples,
- and …



Web API

How to print a booklet for our sport games?

具体的

2

Using SDK
在人家的套路基础上走

1

Traditional Software Development
自己设计套路走

抽象的

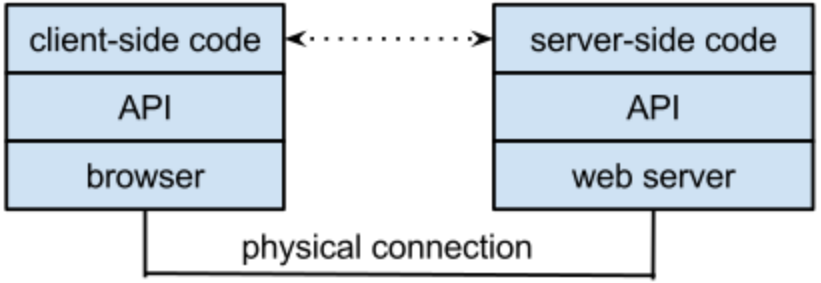
3

Using Web API
自己不动脑子，
完全按人家的套路走

API (Application Programming Interface)

应用程序接口

a set of
subroutine definitions,
protocols,
and tools

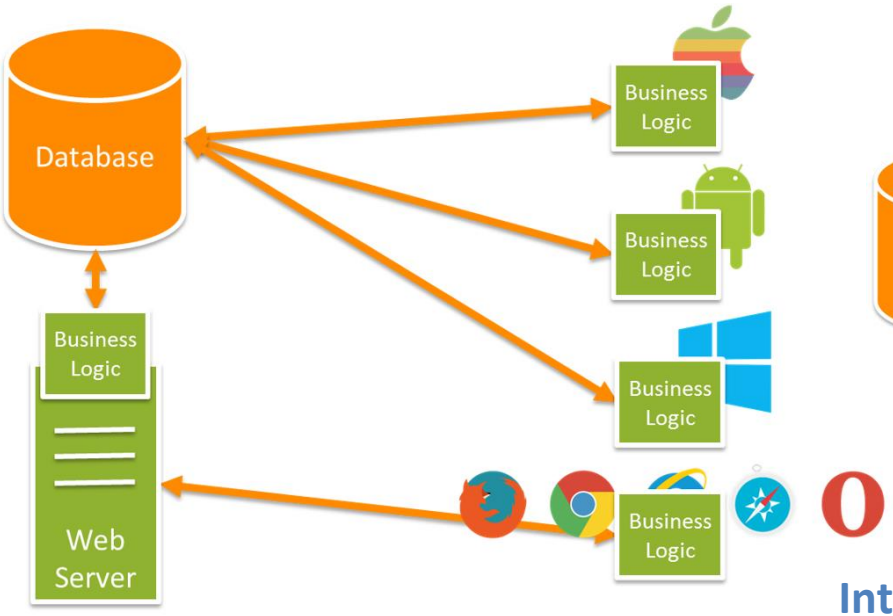


- What is Web API?

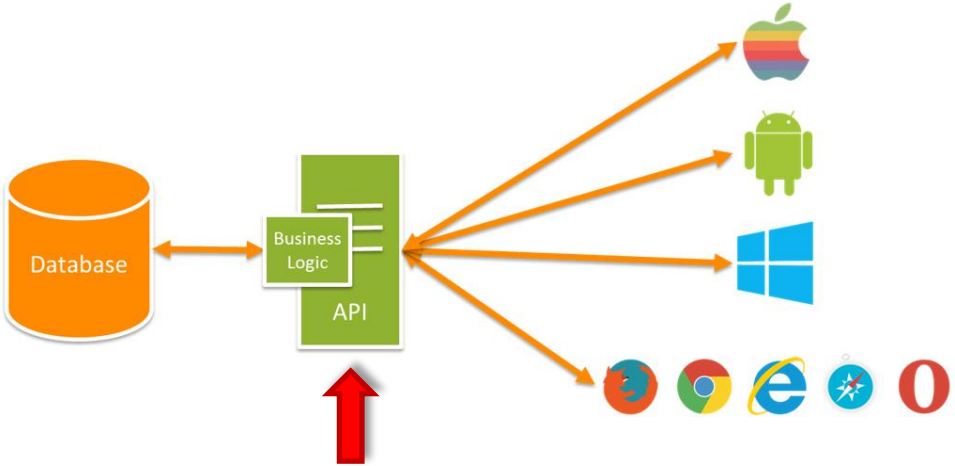
BS/CS

Web API

Short Short Ago



Now



ALL via ONE!!

Integrating all the operations into one package, including “insert”, “delete”, “update”, and “select”.

In Unified Style, two crucial elements:

– Unified Method :

- HTTP (HyperText Transfer Protocol)

超文本传输协议

– Unified Language :

- JSON
- XML

HTTP(HyperText Transfer Protocol)

超文本传输协议

an application protocol for distributed, collaborative, hypermedia information systems, which is the foundation of data communication for the World Wide Web.

- GET
  - Give Me Information
- POST
  - Give Server Information

Do you remember "Login.py" ?

Ref. http://www.w3school.com.cn/tags/html_ref_httpmethods.asp

Web API

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-

from flask import Flask
from flask import request
#import pymysql
import pymssql
#import sqlite3

app = Flask(__name__)

@app.route('/', methods=['GET', 'POST'])
def home():
    return '''<h1>Home</h1>
              <p><a href="/login">Login</a></p>'''


@app.route('/login', methods=['GET'])
def login_form():
    return '''<form action="/login" method="POST">
              <p><input name="username"></p>
              <p><input name="password" type="password"></p>
              <p><button type="submit">Log In Now</button></p>
              </form>'''
```

```python
@app.route('/login', methods=['POST'])
def login():
    # get data from database:
    # 1.Connection Open
    conn = pymssql.connect(user='sa', password='123456', database='login')
    # 2.Cursor Creating:
    cursor = conn.cursor()
    # 3.SQL Execution
    sqlstr = 'select * from customer where customer_name=\''+request.form['username']+\
             '\' and customer_pwd=\''+request.form['password']+'\''
    # 4.Cursor Moving
    cursor.execute(sqlstr)
    numrows = len(cursor.fetchall())
    conn.commit()
    # 5.Connection Close
    cursor.close()
    conn.close()
    # get data from request:
    if numrows>0:
        return '<h3>Hello, '+request.form['username']+'</h3>'
    return '<h3>Bad username or password.</h3>'

if __name__ == '__main__':
    app.run()
```

Login.py

Language of Web API

– XML (EXtensible Markup Language)

```
<?xml version="1.0" encoding="UTF-8" ?>
        <employees>
                <firstName>Bill</firstName>
                <lastName>Gates</lastName>
        </employees>
        <employees>
                <firstName>George</firstName>
                <lastName>Bush</lastName>
        </employees>
        <employees>
                <firstName>Thomas</firstName>
                <lastName>Carter</lastName>
        </employees>
```

Ref. http://www.w3school.com.cn/x.asp

Language of Web API

– JSON (JavaScript Object Notation)

```
{ "employees": [
{ "firstName":"Bill" , "lastName":"Gates" },
{ "firstName":"George" , "lastName":"Bush" },
{ "firstName":"Thomas" , "lastName":"Carter" }
] }
```

Ref. http://www.w3school.com.cn/json/index.asp

Transfer between XML and JSON

http://www.bejson.com/xml2json/

在线XML、JSON数据互转

如题

XML

```
<?xml version="1.0" encoding="UTF-8" ?>
    <employees>
        <firstName>Bill</firstName>
        <lastName>Gates</lastName>
    </employees>
    <employees>
        <firstName>George</firstName>
        <lastName>Bush</lastName>
    </employees>
    <employees>
        <firstName>Thomas</firstName>
        <lastName>Carter</lastName>
    </employees>
```

转义编码

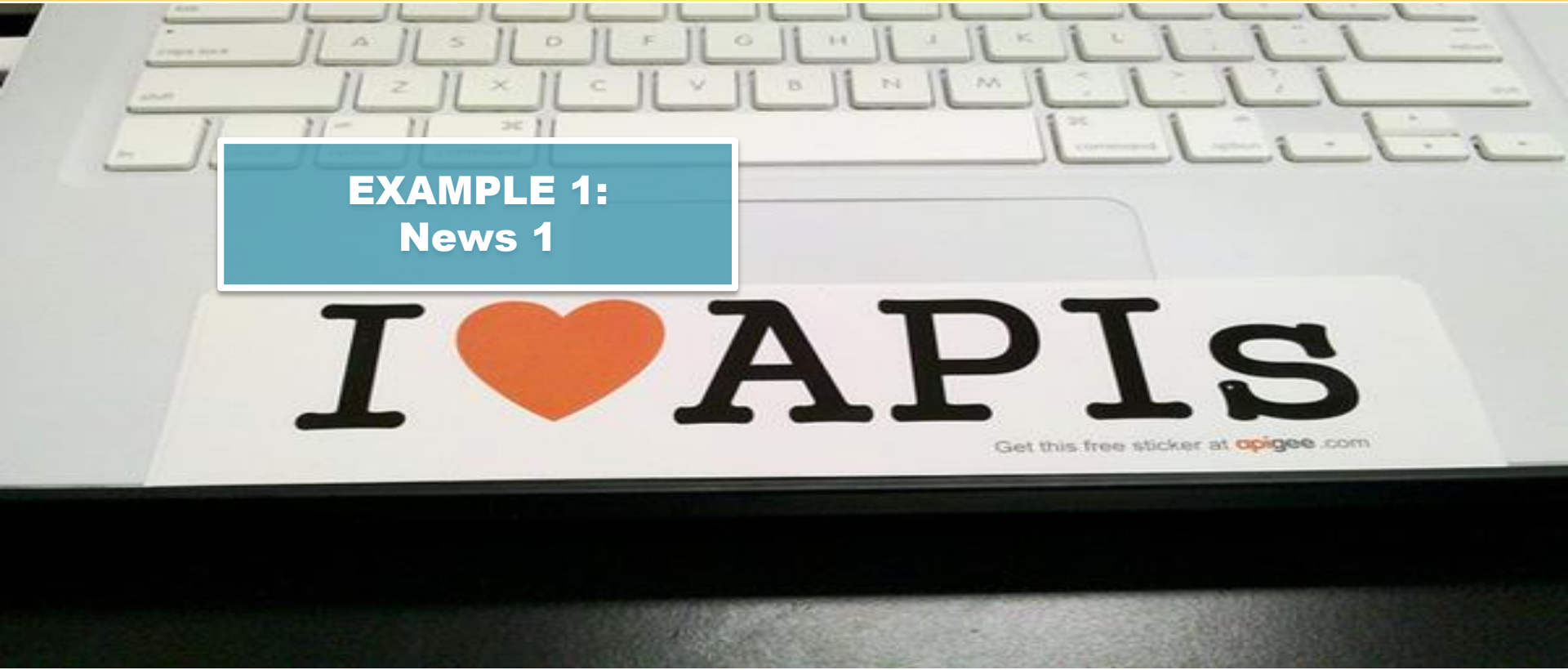
清空

JSON

```
{ "employees": [ { "firstName":"Bill" , "lastName":"Gates" }, {
"firstName":"George" , "lastName":"Bush" },{ "firstName":"Thomas" ,
"lastName":"Carter" } ] }
```

Why JSON is more and more popular?

Web API

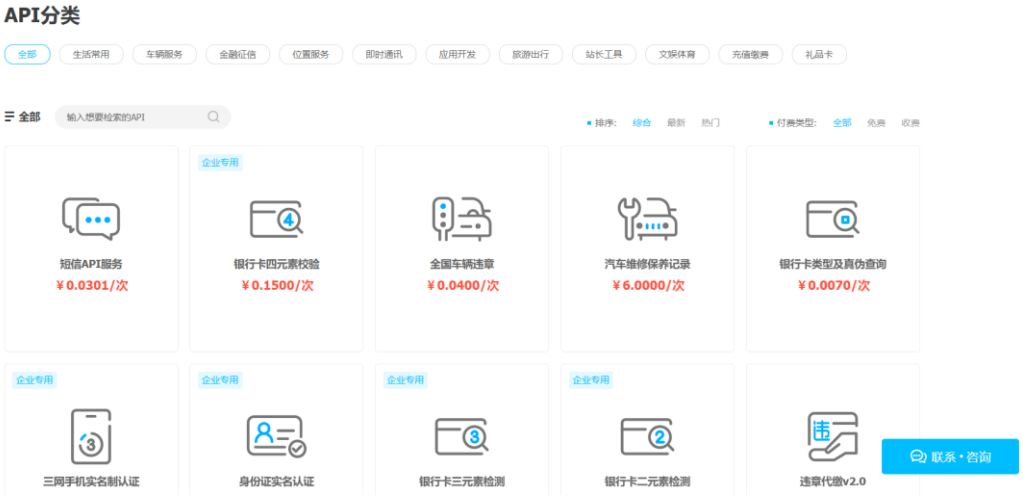


EXAMPLE 1:
News 1

Web API

www.juhe.cn

聚合数据



Juhe is a technology company that offers mobile data services and products in China.

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Step 1: you should have your own account

- Log in the web: https://www.juhe.cn/register
- You may register your account by cellphone or email.
- You may log in the website after you register it.

Step 2: select an API(1)

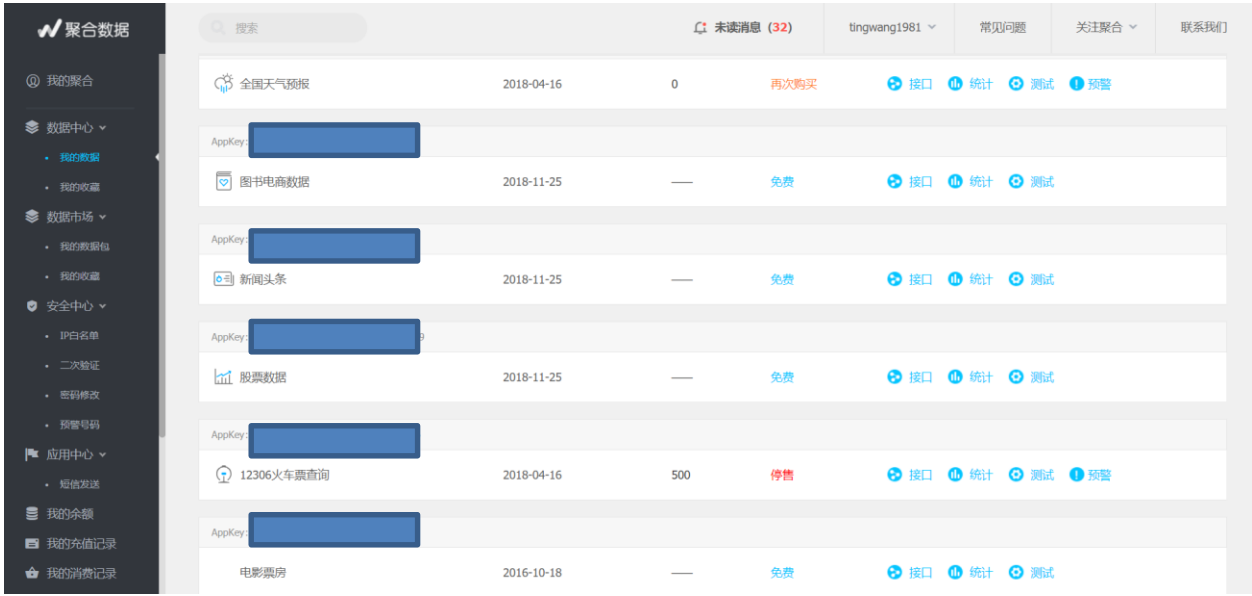
- You may select
  a FREE API for test.

Step 2: select an API(2)

- Do not forget to confirm your information in two months, if the API is not free.

Step 3: Save the AppKey of API

- You may start to use your API after you confirm your information.



Web API

- You may visit the main page of your API to get more detailed information.

- If the API is not free, you should pay for it.

Step 4: write the code

- Examples are important.
- Sometimes, there is no Python examples.

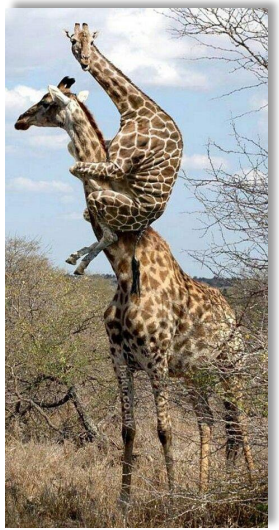
How to write python code,

if we cannot find it in examples?

To look for a similar one!

Web API

- Here is an example which has a code in Python.
  https://www.juhe.cn/docs/api/id/11



Standing on the Shoulders of Giants (SSG)

不要什么都去自己写，要thinking in SSG！

Web API

- Thinking in SSG!

① Analyze Code: https://code.juhe.cn/docs/1018

② Rewrite Code: based on both python examples from other APIs and the codes in your API.

③ Test Code

Some Codes are in Python 2, which should be rewritten with Python 3.

Project

Lecture 6 D:\SISU\Courses\2018新媒体数据分析与应用 (20

- API.py
- CityWeather.py
- CityWeather2.py
- CityWeatherAPI.py

External Libraries

CityWeatherAPI.py

```python
# 全国天气预报调用示例代码 — 聚合数据
# 在线接口文档：https://www.juhe.cn/docs/api/id/39
# ----------------------------------------

def main():
    # 配置您申请的APPKey
    appkey = "[redacted]"

    # 1.城市天气查询
    request1(appkey, "GET")


# 城市天气查询
def request1(appkey, m="GET"):
    url = "http://v.juhe.cn/weather/index"
    params = {
        "cityname": "苏州",  # 需要查询的城市
        "key": appkey,  # 应用APPKEY(应用详细页查询)
        "dtype": "",  # 返回数据的格式,xml或json，默认json
        "format": "",  # //未来6天预报(future)两种返回格式，1或2，默认1
    }
    params = urlencode(params)
    if m == "GET":
```

main()

Run CityWeatherAPI

'wind': '东南风3-5级', 'week': '星期六', 'date': '20180421'}, 'day_20180422': {'temperature': '9℃~21℃', 'weather': '晴', 'weather_id': {'fa': '00', 'fb': '00'}, 'wind': '东南风3-5级', 'week': '星期日', 'date': '20180422'}}}

Web API

- The Code

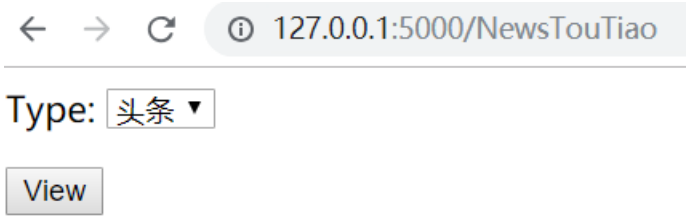
```python
# -*- coding: utf-8 -*-
import json, urllib.request
from urllib.parse import urlencode

# ----------------------------------

#  新闻头条调用示例代码 — 聚合数据
by Dr. Ting Wang
#  在线接口文档: https://www.juhe.cn/docs/api/id/235
# ----------------------------------

def main():
    # 配置您申请的APPKey
    appkey = "04f*****************************17c"

    # 1.新闻头条查询
    request1(appkey, "GET")
```

```python
def request1(appkey, m="GET"):
    url = "http://v.juhe.cn/toutiao/index"
    params = {
        "type": "shehui",  # top(头条，默认),shehui(社会),guonei(国内),guoji(国际),yule(娱乐),tiyu(体育),junshi(军事),keji(科技),caijing(财经),shishang(时尚)
        "key": appkey,  # 应用APPKEY(应用详细页查询)
        "dtype": "",  # 返回数据的格式,xml或json，默认json
    }
    params = urlencode(params)
    if m == "GET":
        f = urllib.request.urlopen("%s?%s" % (url, params))
    else:
        f = urllib.request.urlopen(url, params)
    content = f.read()
    res = json.loads(content)
    if res:
        error_code = res["error_code"]
        if error_code == 0:
            # 成功请求
            print(res["result"])
        else:
            print("%s:%s" % (res["error_code"], res["reason"]))
    else:
        print("request api error")
if __name__ == '__main__':
    main()
```

Step 5: embed your API code to your system

- Question:
  Flask can provide us a web interface. Can we embed the code to Flask website?

Results：



Web API

```python
from flask import Flask
from flask import request
import json, urllib.request
from urllib.parse import urlencode

app = Flask(__name__)

@app.route('/', methods=['GET', 'POST'])
def home():
    return '''<h1>Home</h1>
            <p><a href="/NewsTouTiao">NewsTouTiao</a></p>'''

@app.route('/NewsTouTiao', methods=['GET'])
def login_form():
    return '''<form action="/NewsTouTiao" method="POST">
            <p>Type:
            <select name="NewsType">
            <option value="top">头条</option>
            <option value="shehui">社会</option>
            <option value="guonei">国内</option>
            <option value="guoji">国际</option>
            <option value="yule">娱乐</option>
            <option value="tiyu">体育</option>
            <option value="junshi">军事</option>
            <option value="keji">科技</option>
            <option value="caijing">财经</option>
            <option value="shishang">时尚</option>
            </select>
            </p>
            <p><button type="submit">View</button></p>
            </form>'''
```

<-Login

```python
@app.route('/NewsTouTiao', methods=['POST'])
def login():
    # 配置您申请的APPKey
    appkey = "04f*****************************17c"

    NewsType = request.form["NewsType"]

    # 1.新闻查询
    return NewsType+"新闻："+request1(NewsType, appkey, "GET")

# 新闻查询
def request1(NewsType, appkey, m="GET"):
    url = "http://v.juhe.cn/toutiao/index"
    params = {
        "type": NewsType,  # top(头条，默认),shehui(社会),guonei(国内),guoji(国际),yule(娱乐),tiyu(体育),junshi(军事),keji(科技),caijing(财经),shishang(时尚)
        "key": appkey,  # 应用APPKEY(应用详细页查询)
        "dtype": "",  # 返回数据的格式,xml或json，默认json
    }
    params = urlencode(params)
    if m == "GET":
        f = urllib.request.urlopen("%s?%s" % (url, params))
    else:
        f = urllib.request.urlopen(url, params)
    content = f.read()
    res = json.loads(content)
    if res:
        error_code = res["error_code"]
        if error_code == 0:
            # 成功请求
            return str(res["result"])
        else:
            return str(res["error_code"])+":"+ str(res["reason"])
    else:
        return "request api error"
if __name__ == '__main__':
    app.run()
```

<-Main()

<-almost the same

Web API

Tips:

1. Register, Login, and get your **API KEY** from each website before you use API.

2. Different websites have different API Keys.

3. Copy and Paste, **Standing on the Shoulders of Giants**

Web API

*What are the **advantages** and **disadvantages** of using API?*

- *Advantages:*
  - *much easier to get useful information*
  - *more efficient to develop website platforms*
  - *more helps from professionals*
- *Disadvantages:*
  - *maybe not free*
  - *maybe limitations (cannot use it sometime in the future)*
  - *maybe some mistakes or exceptions*

human-readable text for data transmission

JSON

Analyzing JSON

1. import json
2. json.loads
3. json.dumps
4. get data following the tree
5. output results

JSON结构视图

http://www.bejson.com/jsonviewernew/

视图 JSON数据

```
JSON
  stat : "1"
  data
    0
      uniquekey : "0b69145dce86d165f455b08b77082e84"
      title : "将巧克力丢入容器并抽走空气，1分钟后神奇一幕"
      date : "2018-11-25 23:44"
      category : "社会"
      author_name : "核市财经说"
      url : "http://mini.eastday.com/mobile/181125234405549.html"
      thumbnail_pic_s : "http://03imgmini.eastday.com/mobile/20181125/20181125234405_333e22ba6145b70a2dfc73ae764ad760_2_mwpm_03200403.jpg"
      thumbnail_pic_s02 : "http://03imgmini.eastday.com/mobile/20181125/20181125234405_333e22ba6145b70a2dfc73ae764ad760_1_mwpm_03200403.jpg"
      thumbnail_pic_s03 : "http://03imgmini.eastday.com/mobile/20181125/20181125234405_333e22ba6145b70a2dfc73ae764ad760_5_mwpm_03200403.jpg"
    1
    2
    3
    4
    5
    6
    7
    8
    9
    10
    11
    12
    13
    14
    15
    16
    17
    18
    19
    20
    21
    22
```

有中文

```
NewTitle = json.dumps(response_json['data'][0].get("title"), ensure_ascii=False)

NewsDate = json.dumps(response_json['data'][0].get("date"))
```

无中文

JSON

- The result :

{‘stat’: ‘1’, ‘data’: [{‘uniquekey’: ‘0b69145dce86d165f455b08b77082e84’, ‘title’: ‘将巧克力丢入容器并抽走空气，1分钟后神奇一幕’, ‘date’: ‘2018-11-25 23:44’, ‘category’: ‘社会’, ‘author_name’: ‘楼市财经说’, ‘url’: ‘http://mini.eastday.com/mobile/181125234405549.html’, ‘thumbnail_pic_s’: ‘http://03imgmini.eastday.com/mobile/20181125/20181125234405_333e22ba6145b70a2dfc73ae764ad760_2_mwpm_03200403.jpg’, ‘thumbnail_pic_s02’: ‘http://03imgmini.eastday.com/mobile/20181125/20181125234405_333e22ba6145b70a2dfc73ae764ad760_1_mwpm_03200403.jpg’, ‘thumbnail_pic_s03’: ‘http://03imgmini.eastday.com/mobile/20181125/20181125234405_333e22ba6145b70a2dfc73ae764ad760_5_mwpm_03200403.jpg’},……

JSON

```
@app.route('/NewsTouTiao', methods=['POST'])
def login():
    # 配置您申请的APPKey
    appkey = "04f*********************************17c"
    NewsType = request.form["NewsType"]
    if NewsType == "top":
        CNewsType = "头条"
    elif NewsType == "shehui":
        CNewsType = "社会"
    elif NewsType == "guonei":
        CNewsType = "国内"
    elif NewsType == "guoji":
        CNewsType = "国际"
    elif NewsType == "yule":
        CNewsType = "娱乐"
    elif NewsType == "tiyu":
        CNewsType = "体育"
    elif NewsType == "junshi":
        CNewsType = "军事"
    elif NewsType == "keji":
        CNewsType = "科技"
    elif NewsType == "caijing":
        CNewsType = "财经"
    elif NewsType == "shishang":
        CNewsType = "时尚"
    else:
        CNewsType = "头条"
    ResultTable="<table><tr><td>#</td><td>Title</td><td>Date</td><td>Category</td><td>Author</td></tr>"
    response = request1(NewsType, appkey, "GET").replace("'", '"')
    response_json = json.loads(response)
    for i in range(30):
        NewTitle = json.dumps(response_json['data'][i].get("title"), ensure_ascii=False)
        NewsDate = json.dumps(response_json['data'][i].get("date"))
        NewCate = json.dumps(response_json['data'][i].get("category"), ensure_ascii=False)
        NewAuthor = json.dumps(response_json['data'][i].get("author_name"), ensure_ascii=False)
        NewsURL = json.dumps(response_json['data'][i].get("url"))
        ResultTable+="<tr><td>"+str((i+1))+"</td><td><a href='"+NewsURL[1:-1]+"' target='_blank'>"+NewTitle[1:-
1]+"</a></td><td>"+NewsDate[1:-1]+"</td><td>"+NewCate[1:-1]+"</td><td>"+NewAuthor[1:-1]+"</td></tr>"
    ResultTable+="</table>"
    # 1.新闻查询
    return CNewsType+"新闻："+ResultTable
```

EXAMPLE 2:
News 2

JSON

Example

127.0.0.1:5000/NewsTouTiao

财经新闻：

#	Title	Date	Category	Author
1	实体店定价超原产国 加拿大鹅打击代购缺诚意	2018-11-26 00:29	财经	北京商报
2	当U盘已成往事：关于青春，你还记得什么？	2018-11-26 00:27	财经	中国新闻网
3	家庭不和睦，人就会生病！	2018-11-26 00:07	财经	一生致富
4	“爸，在忙吗？”这两天，杭州多位家长收到这种短信	2018-11-25 23:49	财经	杭州卡洛儿
5	捐款1个亿！80后夫妇王麒诚和妻子吴艳浙大演讲，满满的创业干货	2018-11-25 23:46	财经	GW34568创业家
6	企业出现如下几种现象，仍不进行变革，结局只能是关门大吉	2018-11-25 23:24	财经	诺言说职场
7	东北玉米价位已至高位 或难以持续上涨行情	2018-11-25 23:23	财经	科学兴农
8	大蒜市场观察：今年大蒜市场遇冷，2019年会上涨吗？	2018-11-25 23:23	财经	科学兴农
9	这个一线城市二手房市场凉凉，业主降价15%卖房，中介半年没接单	2018-11-25 23:19	财经	每日经济新闻
10	龙头点评：目前市场唯一四板，有望领涨大盘（附股）	2018-11-25 23:19	财经	美湖路的老程
11	再生水利用将成破解水资源短缺重要途径 千亿级水处理行业迎来新风口	2018-11-25 23:17	财经	每日经济新闻
12	四川自贸试验区：为内陆开放添动力	2018-11-25 23:17	财经	新华网
13	国际煤市要闻回顾（11.19-11.23）	2018-11-25 22:48	财经	懂焦帝
14	目前主产区玉米价格仍处于上涨通道中 农民怎么才能卖个最高价	2018-11-25 22:45	财经	每日粮油
15	家家悦亿元入股福悦祥，11家门店及13万平物流中心尽归麾下！	2018-11-25 22:41	财经	第一纺织网
16	柬埔寨智慧农业领域发展潜力依旧巨大	2018-11-25 22:40	财经	华彩国际传媒
17	300多天，400余次调控，未来房价如何走	2018-11-25 22:27	财经	今朝聊房事
18	实话告诉你! 未来10年才是最好的买房时期	2018-11-25 22:27	财经	深度金融
19	房价涨愁，房价跌忧，刚需到底怎么了？	2018-11-25 22:27	财经	天狼说地产
20	这 6 只年报预增翻倍股被机构盯上了！	2018-11-25 22:25	财经	21世纪经济报道
21	马云讲：没钱该不该创业三句话选择创业新思路	2018-11-25 22:24	财经	要树立干事创业的鲜明导向
22	股价“梦回2017”，缺钱的复星医药正“骑虎难下”	2018-11-25 22:23	财经	中访网
23	家族信托与集合资金信托的区别是什么?	2018-11-25 22:17	财经	超仁博一博
24	从禁止石油开采到成为全球头号产油国，美国为何突然大量出口石油	2018-11-25 22:16	财经	环球财经天下

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some examples on social media

Web API Applications

OAuth

An open protocol to allow secure API authorization in a simple and standard method from web, mobile and desktop applications.

```
+--------+                               +---------------+
|        |--(A)- Authorization Request ->|   Resource    |
|        |                               |     Owner     |
|        |<-(B)-- Authorization Grant ---|               |
|        |                               +---------------+
|        |
|        |                               +---------------+
|        |--(C)-- Authorization Grant -->| Authorization |
| Client |                               |     Server    |
|        |<-(D)----- Access Token -------|               |
|        |                               +---------------+
|        |
|        |                               +---------------+
|        |--(E)----- Access Token ------>|    Resource   |
|        |                               |     Server    |
|        |<-(F)--- Protected Resource ---|               |
+--------+                               +---------------+
```

API Key needed

Access Token needed

Ref. http://www.ruanyifeng.com/blog/2014/05/oauth_2_0.html

Web API Applications

EXAMPLE 3:
Friendship of TVs on Twitter

Problem Description

This research aims to investigate the significance and activeness of TV media companies in the world. Twitter friendships between TV broadcasting companies were employed for this research. Totally, about 104 TV channels from different countries are selected for this research. In-Degree and Out-Degree are used as features in this study.

Features:

In-Degree: Followed by Others, which shows the significance to the world

Out-Degree: Following Others, which shows the activeness in the world

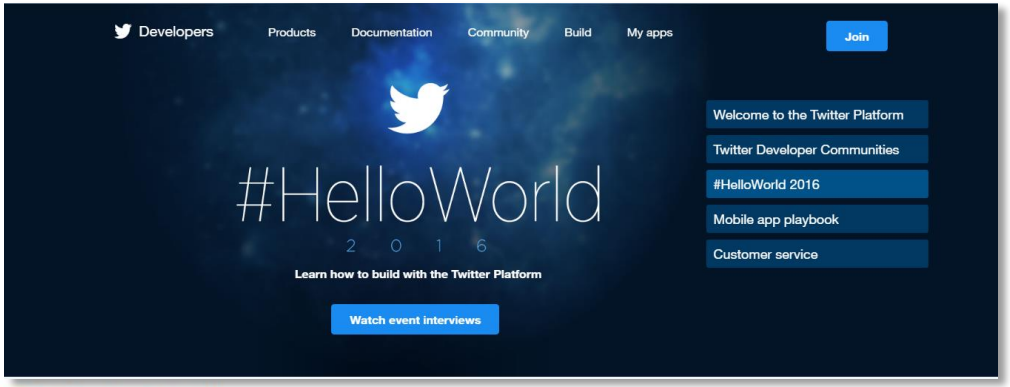
twitter and Its API

twitter

Do NOT tell me you do NOT know twitter, even you are a Chinese.

If you really do not know it, visit https://twitter.com right now!

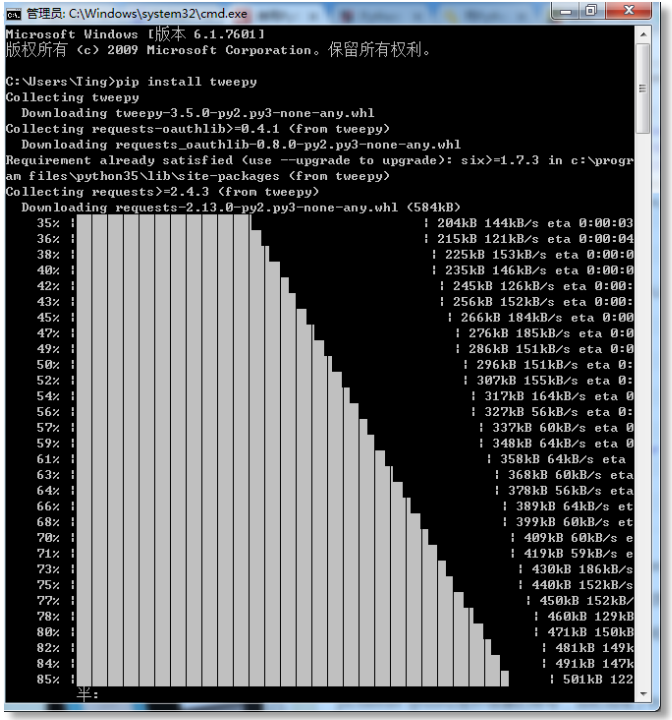
twitter API: https://dev.twitter.com/



Friendship of TVs on Twitter

Tweepy

An easy-to-use Python library for accessing the Twitter API



Installation

pip install tweepy

Reference to Tweepy

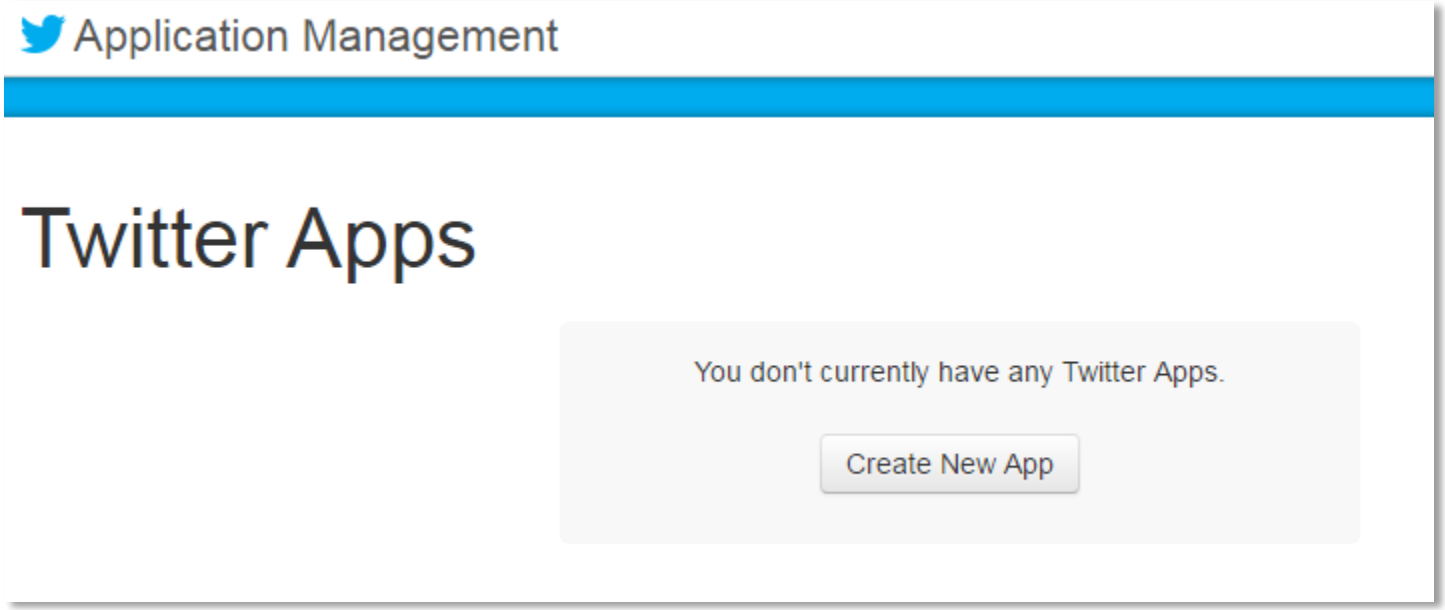
https://github.com/tweepy/tweepy

http://www.tweepy.org/

http://pythonhosted.org/tweepy/

Register Your Twitter APPs

Step 1 : visit **https://apps.twitter.com/,** and click on the button "**Create New APP**".



Friendship of TVs on Twitter

Step2 : Input the detailed information of your new app.

Create an application

Application Details

Name *

Your application name. This is used to attribute the source of a tweet and in user-facing authorization screens. 32 characters max.

Description *

Your application description, which will be shown in user-facing authorization screens. Between 10 and 200 characters max.

Website *

Your application's publicly accessible home page, where users can go to download, make use of, or find out more information about your application. This fully-qualified URL is used in the source attribution for tweets created by your application and will be shown in user-facing authorization screens.
(If you don't have a URL yet, just put a placeholder here but remember to change it later.)

Friendship of TVs on Twitter

Step3: Get your API keys and Access Tokens

[Notes]

You may get all these information when you click on "**Keys and Access Tokens**".

Details | Settings | Keys and Access Tokens | Permissions

https://twitter.com/tingandwang

Organization

Information about the organization or company associated with your a

Organization	None
Organization website	None

Application Settings

Your application's Consumer Key and Secret are used to authenticate

Access level	Read and write (modify app permissions)
Consumer Key (API Key)	qcQYzdOBWYMArsRHp3vTbogC tokens)
Callback URL	None
Callback URL Locked	No
Sign in with Twitter	Yes
App-only authentication	https://api.twitter.com/oauth2/token
Request token URL	https://api.twitter.com/oauth/request_token
Authorize URL	https://api.twitter.com/oauth/authorize

Friendship of TVs on Twitter

Steps for the System

1. Connect to twitter by API Keys and Access Tokens
2. Find the relationship using Tweepy functions

`API.show_friendship`(*source_id/source_screen_name, target_id/target_screen_name*)

Returns detailed information about the relationship between two users.

Parameters:

- **source_id** – The user_id of the subject user.
- **source_screen_name** – The screen_name of the subject user.
- **target_id** – The user_id of the target user.
- **target_screen_name** – The screen_name of the target user.

Return type: `Friendship` object

3. Save the results

Results

In-Degree for the significance of TV media

In-Degree Ranking

	Country	TV Media	Twitter ID	In-Degree
1	USA	CNN	CNN	26
2	Russia	Russia Today	RT_com	14
3	UK	BBC	BBCNews	13
4	Qatar	Al Jazeera television	AJENews	6
5	Spain	Radio Televisión Española	rtve	5
6	Netherland	Nederlandse Omroep Stichting	NOS	2
7	South Africa	South African Broadcasting Corporation, SABC	SABCNewsOnline	2
8	Lebanon	Al-Manar TV	almanarnews	2

Friendship of TVs on Twitter

Out-Degree for the activeness of TV media

Out-Degree Ranking

	Country	TV Media	Twitter ID	Out-Degree
1	Ireland	Raidió Teilifís Éireann, Ireland's National Public Service Multi-Media Organisation	rte	17
2	Ecuador	Ecuavisa	ecuavisa	6
3	Kenya	Kenya Broadcasting Corporation	KBCChannel1	5
4	Namibia	Namibian Broadcasting Corporation	NBCNamibia	4
5	Russia	Russia Today	RT_com	4
6	Bolivia	Bolivia TV	Canal_BoliviaTV	3
7	Singapore	Television Corporation of Singapore	ChannelNewsAsia	3
8	Fiji	Fiji Television Limited	FijiOneNews	3
9	Guyana	National Communications Network, Guyana	NCNGuyana	3
10	Tonga	Tonga Broadcasting Commission	TBCa3z	3
11	Afghanistan	TOLONews	TOLONews	3
12	Macedonia	Macedonian Radio-Television	mrt1web	3

Friendship of TVs on Twitter

Conclusions

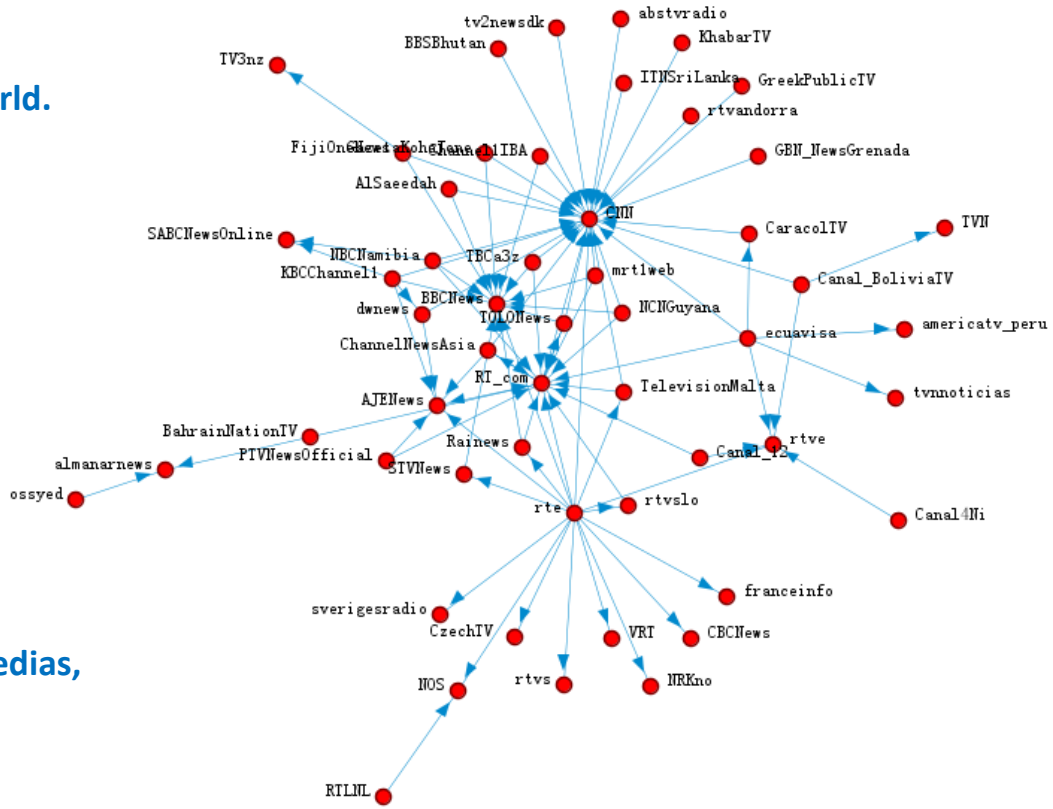
1. CNN, BBCNews, and Russia Today have the greatest significance to the world.

2. Raidió Teilifís Éireann from Ireland is the most active TV media.

3. Media from developed countries have greater influence.

4. Media from developing countries are more active.

5. CCTV, China neither follow any other medias, nor be followed by any other medias.



Reference

Reference

- XML
  - http://www.w3school.com.cn/x.asp
- JSON
  - http://www.w3school.com.cn/json

Reference

Baidu (http://apistore.baidu.com/)
Weibo (http://open.weibo.com/wiki/微博API)
WeChat (http://dev.wechat.com/)
QQ Tencent (http://wiki.open.qq.com/wiki/API文档)
360 (http://open.360.cn/)
Taobao (http://open.taobao.com/docs/api_list.htm?spm=a219a.7386653.1.22.3XIaLs)
JD (http://jos.jd.com/)
Suning (http://open.suning.com/)
Douban (https://developers.douban.com/)
Juhe (https://www.juhe.cn/)
Google (https://developers.google.com/)
Facebook (http://developers.facebook.com/)
Twitter (https://dev.twitter.com/)
Linkedin (https://developer.linkedin.com/)

Homework

Homework

1. Save the results of Example 2 to Data Base. Deadline: Dec. 9th.

   Please DO NOT forget to send your code to tingwang_sisu@163.com

Homework

2. Prepare for your final paper.

1. 金鸡奖的国际影响力分析
2. 金鸡奖最佳演员的国际影响力分析
3. 金鸡奖最佳导演的国际影响力分析
4. 金鸡奖最佳故事片的国际影响力分析
5. 国内影视基地的国际影响力分析
6. 国内影视公司的国际影响力分析
7. 国内影视基金的国际影响力分析
8. 国内电影节的国际影响力分析
9. 香港电影金像奖的国际影响力分析
10. 香港电影金像奖最佳演员的国际影响力分析
11. 香港电影金像奖最佳导演的国际影响力分析
12. 中国台湾电影金马奖的国际影响力分析
13. 中国台湾电影金马奖最佳演员的国际影响力分析
14. 中国台湾电影金马奖最佳导演的国际影响力分析
15. 上海国际电影节的国际影响力分析
16. 上海国际电影节金爵奖华人最佳影片的国际影响力分析
17. 上海国际电影节金爵奖华人最佳演员的国际影响力分析
18. 上海国际电影节金爵奖华人最佳导演的国际影响力分析
19. 近年来中国奥运冠军的国际影响力分析
20. 中国新能源汽车国际影响力分析
21. 中国国家级对外媒体的国际影响力分析
22. 中国航空公司的国际影响力分析
23. 中国手机品牌的国际影响力分析

The End of Lecture 4

Thank You

http://www.wangting.ac.cn