



# 社会网络分析

案例：抓取并构建网易音乐人网络

邵鹏 博士

副教授 硕士生导师

西安工程大学管理学院

shaopengde@sohu.com

inebm.cn



# 问题

网易云音乐有很多原创音乐人，这些音乐人在在线上平台上社交关系。

这些音乐人的线上社交网络关系有什么特征？网络如何构建？

网易云音乐 发现音乐 我的音乐 朋友 商城 音乐人 下载客户端 HOT  [创作者中心](#)

**桃德李** CNIP·陆 Lv.8 ♂ [发私信](#) [+ 关注](#) [查看歌手页](#)

[音乐人](#) [网易音乐人](#) [作词](#) [作曲](#)

180 动态    191 关注    475063 粉丝

个人介绍：不那么独立的独立音乐人。  
所在地区：上海市    年龄：90后  
社交网络：

### 桃德李创建的电台

电台名称	订阅次数	期数
进来睡觉！	订阅701次	2期
ALL About Todd LI	订阅63007次	16期

### 桃德李创建的歌单<sup>®</sup> ( 5 )

歌单封面	播放量
	57.1万
	14.5万
	1031
	32767
	7907

1 确定数据爬取方案



2 爬取云音乐相关数据（创作人社交信息）



3 清洗数据、构建网络



# 1 确定数据爬取方案

以“原创榜100歌”的音乐人作为例进行研究

<https://music.163.com/#/discover/toplist?id=2884035>

The screenshot shows the NetEase Music (网易云音乐) website interface. The top navigation bar includes '发现音乐' (Discover Music), '我的音乐' (My Music), '朋友' (Friends), '商城' (Market), '音乐人' (Musicians), and '下载客户端' (Download Client). A search bar and '创作者中心' (Creator Center) are also visible. The main content area features a sidebar with various music charts, including '云音乐特色榜' (NetEase Music Specialty Charts) and '全球媒体榜' (Global Media Charts). The '原创榜' (Originality 100 Songs) chart is highlighted, showing its update schedule and interaction buttons. The main content area displays the '原创榜' title, update date, and a list of 100 songs with columns for title, duration, and artist.

	标题	时长	歌手
1	抢先	04:18	Todd Li
2	多少	03:43	金玟岐
3	如果呢	04:17	郑润泽
4	Pull The Trigger	04:27	夏日入侵企画
5	艳丽芬芳	04:23	要不要买菜
6	爱似包法利 (IMMORTAL)	03:28	ODD陈思键
7	云之彼端	03:24	CMJ
8	亲爱的你	03:57	郭静



# 1 确定数据爬取方案

## 获取歌手艺术家artist页面网址

https://music.163.com/#/artist?id=12268138

https://music.163.com/#/artist?id=12268138

网易云音乐 发现音乐 我的音乐 朋友 商城 音乐人 下载客户端 **HOT**

推荐 排行榜 歌单<sup>®</sup> 主播电台 歌手 新歌上架

Todd Li 桃德李

热门作品 所有专辑 相关MV 艺人介绍

个人主页 收藏

播放	+	收藏热门50	热门单曲
1	▶	小宇	03:46 小宇
2	▶	第三人称 - (The Third Person and I)	04:09 第三人称
3	▶	太久	04:02 太久?
4	▶	狂妄	03:51 狂妄
5	▶	抢先	04:18 抢先
6	▶	伴云	04:35 伴云

## 获取歌手用户user页面网址

https://music.163.com/#/user/home?id=109349540

https://music.163.com/#/user/home?id=109349540

网易云音乐 发现音乐 我的音乐 朋友 商城 音乐人 下载客户端 **HOT**

音乐/视频/电台/用户 创作者中心

桃德李 **CNIP·陆** **Lv.8** **♂** 发私信 + 关注 查看歌手页

音乐人 网易音乐人 作词 作曲

180 191 475064  
动态 关注 粉丝

个人介绍：不那么独立的独立音乐人  
所在地区：上海市 年龄：90后  
社交网络：👁️

桃德李创建的电台

	进来睡觉！	订阅701次	2期
	ALL About Todd LI	订阅63007次	16期

桃德李创建的歌单<sup>®</sup> (5)

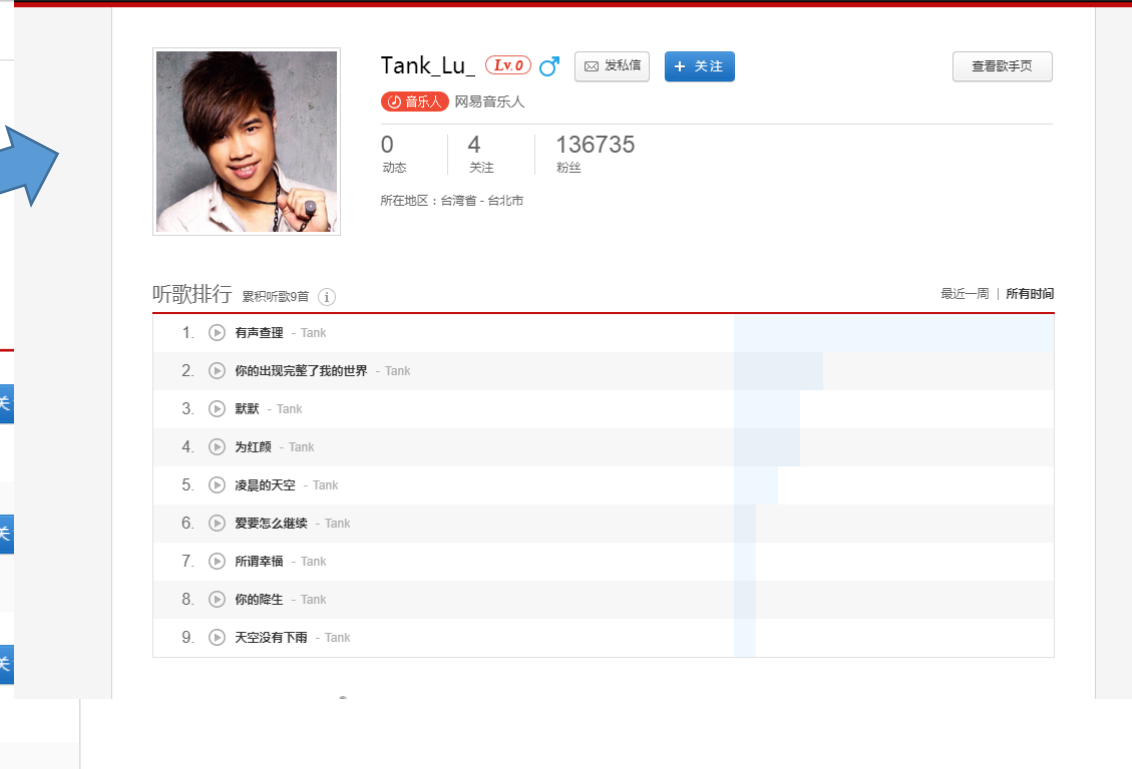
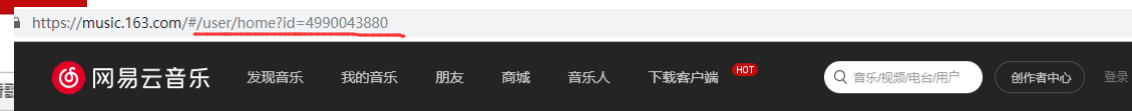
# 1 确定数据爬取方案

获取歌手出度follows网址

<https://music.163.com/#/user/follows?id=109349540>

抓取该歌手关注的用户的信息

<https://music.163.com/#/user/home?id=4990043880>

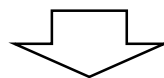




# 1 确定数据爬取方案

以“原创榜100歌”的音乐人为例进行研究

<https://music.163.com/#/discover/toplist?id=2884035>



获取100首歌的歌手艺术家artist页面网址

如 <https://music.163.com/#/artist?id=12268138>



EXCEL1, 数据n小于等于100条

获取歌手用户user页面网址,出度follows网址

如 <https://music.163.com/#/user/home?id=109349540>

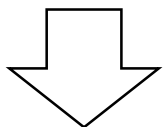
如 <https://music.163.com/#/user/follows?id=109349540>



EXCEL2, 数据n小于等于100条

抓取每位歌手关注的用户的信息

如 <https://music.163.com/#/user/home?id=4990043880>



EXCEL3, n位歌手及其关注的用户的网址



# 2 爬取云音乐相关数据

## 规则1, 获取100首歌的歌手艺术家artist页面网址

The screenshot displays a web crawler configuration interface. On the left, a workflow diagram shows a sequence: '打开网页' (Open page) -> '循环' (Loop) -> '提取数据' (Extract data). The main area shows a '循环列表 [总共100]' (Loop list [Total 100]) with a list of songs:

Rank	Artist	Song Title	Duration
1	ToddNuT Li	抢先	04:18
2	金如政	多少	03:43
3	郑润泽	如果呢	04:17
4	夏日入侵企画	Pull The Trigger	04:27
5	要不要买菜	艳丽芬芳	04:23
6	陈思键	爱似包法利 (I'MMORTAL)	03:28

A '运行任务' (Run Task) dialog box is open, with the '启动本地采集' (Start local collection) button circled in red. The dialog contains the following text:

**启动本地采集**

在本地计算机立即启动采集, 用来测试任务配置是否正确并按照预期运行, 如果任务配置正确, 则可以本机完成采集任务。

**启动云采集** [立即升级账号>>](#)

在八爪鱼云采集集群上立即启动采集, 并只运行一次, 如果任务配置无误, 云采集启动后可以在任务列表中看到采集的数据, 本增值服务限旗舰版及以上版本用户使用。

**设置定时云采集** [立即升级账号>>](#)

在八爪鱼云采集集群上定时运行该任务, 任务会根据定时设置的时间周期性多次运行, 多次运行采集的数据如果有重复的(所有数据字段完全一致即为重复), 重复数据将被自动过滤。本增值服务限旗舰版及以上版本用户使用。

云采集数据同步API说明 [分享采集规则赚钱](#) **关闭**

At the bottom, a '歌曲列表' (Song list) table is visible, showing the same list of songs as above.



# 2 爬取云音乐相关数据

## 导出数据到EXCEL

1原创音乐榜

编辑任务 采集设置

原创榜 - 排行榜 - 网易云音乐

网易云音乐 发现音乐 我的音乐 朋友 商城 音乐人 下载客户端 HOT 音乐/视频电台/用户 创作者中心 登录

推荐 排行榜 歌单<sup>®</sup> 主播电台 歌手 新碟上架

云音乐特色榜

提取到的数据

字段1_文本_文本	字段1_链接_链接
1 梦游蟹鹤缚动物园	https://music.163.co...
2 康康KAIJMG	https://music.163.co...
3 狮子侠Liou7zonman	https://music.163.co...
4 任菡聆实勋灿	https://music.163.co...
5 闫翁杰晨	https://music.163.co...
6 夏霁海慧日入侵企画	https://music.163.co...
7 买使派元辣椒也用券	https://music.163.co...
8 月事格尘	https://music.163.co...
9 AV规社米产楊佬叁	https://music.163.co...
10 不是花料三议火呀	https://music.163.co...

采集完成!

采集完成!

任务 1原创音乐榜

用时 23秒

共采集数据 100条

导出数据 稍后导出

已采集: 100条 已用时: 22秒 平均速度: 225条/分钟

云备份 导出数据

1原创音乐榜.xlsx - Excel

文件 开始 插入 页面 公式 数据 审阅 视图 开发 福利 Power 百度

A1 : x ✓ fx 字段1\_文本\_文本

	A	B	C
1	字段1_文本_文本	字段1_链接_链接	
2	Todd OoTLi	https://music.163.com/artist?id=12268138	
3	金棠镇嘎玟岐	https://music.163.com/artist?id=893259	
4	郑峻嶷道望润泽	https://music.163.com/artist?id=29051613	
5	夏慧日入侵企画	https://music.163.com/artist?id=12383009	
6	要姐会不要买菜	https://music.163.com/artist?id=33435854	
7	ODdFD陈思键	https://music.163.com/artist?id=12271141	
8	CCJvOMJ	https://music.163.com/artist?id=12157336	
9	郭雅静	https://music.163.com/artist?id=7760	
10	银满红金战临	https://music.163.com/artist?id=188565	
11	时间不耗耗够以后	https://music.163.com/artist?id=12554220	
12	Hayrul仁揭腕海力	https://music.163.com/artist?id=12148091	
13	结斗许冰冰	https://music.163.com/artist?id=31661567	
14	Quinrk4pn葵因	https://music.163.com/artist?id=12291562	
15	程皇情缺安	https://music.163.com/artist?id=12519065	
16	宋马交美阅	https://music.163.com/artist?id=32899861	
17	马也_CunCkrabbit	https://music.163.com/artist?id=13288861	
18	AricdontliNuv	https://music.163.com/artist?id=33900679	
19	徐观场远书	https://music.163.com/artist?id=12133084	
20	AY织熨竿楊佬叁	https://music.163.com/artist?id=12258420	
21	张文还省雪飞	https://music.163.com/artist?id=12138252	
22	文娱兆杰	https://music.163.com/artist?id=12200829	
23	林嗣喙达浪	https://music.163.com/artist?id=15199791	
24	椅子不燥嘛够酷	https://music.163.com/artist?id=29026951	
25	Mv0rai	https://music.163.com/artist?id=6309	
26	徐理它梓淳	https://music.163.com/artist?id=32244736	
27	浦东老福农民	https://music.163.com/artist?id=33284852	
28	胡被万先期皓	https://music.163.com/artist?id=31003906	
29	锦技本九零	https://music.163.com/artist?id=12277185	
30	HARIKI2RI	https://music.163.com/artist?id=12200029	
31	胡党党面部受期皓	https://music.163.com/artist?id=31003906	
32	Knop1wKnow	https://music.163.com/artist?id=27868624	
33	是的该头你的叁	https://music.163.com/artist?id=34301293	
34	共出性小千耽	https://music.163.com/artist?id=31253654	



## 2 爬取云音乐相关数据

**规则2**，循环92位艺术家artist页面网址，获取用户页面网址

保存 开始采集 设置 2个人网址 数据预览 流程

循环列表 [总共92]

- https://music.163.com/artist?id=12268138
- https://music.163.com/artist?id=893259
- https://music.163.com/artist?id=29051613
- https://music.163.com/artist?id=12383009
- https://music.163.com/artist?id=33435854
- https://music.163.com/artist?id=12271141

高级选项

操作名 循环

执行前等待 0秒 或出现元素 元素XPath

元素在Iframe里 IFrame XPath

循环方式  单个元素  固定元素列表  不固定元素列表  网址列表  文本列表

网址来源 手动输入 网址总数：92 编辑

确定

编辑任务 采集设置

正在打开 https://music.163.com/#/artist?id=14312549

网易云音乐 发现音乐 我的音乐

推荐 排行榜

王贰浪

提取到的数据

	字段1_链接	字段2
1	https://music.163.co...	Gold Child
2	https://music.163.co...	因你而在的梦
3	https://music.163.co...	NaCho
4	https://music.163.co...	孟琦
5	https://music.163.co...	小好Lil Good
6	https://music.163.co...	红白色乐队
7	https://music.163.co...	potatocake
8	https://music.163.co...	谢帝
9	https://music.163.co...	王同学Able

Todd Li (桃德李) - 歌手 - 网易云音乐

陈奕迅

网易云音乐

操作提示

请选择页面元素。

查看采集流程

2个人网址.xlsx - Excel

文件 开始 插入 页面 公式 数据 审阅 视图 开发 福昕 Power 百度

A1 : X ✓ f 字段1\_链接

	A	B
1	字段1_链接	字段2
2	https://music.163.com/user/home?id=109349540	Todd Li
3	https://music.163.com/user/home?id=9814155	金玟岐
4	https://music.163.com/user/home?id=542203503	郑润泽
5	https://music.163.com/user/home?id=474348590	夏日入侵企画
6	https://music.163.com/user/home?id=550065289	要不要买菜
7	https://music.163.com/user/home?id=396416696	ODD陈思键
8	https://music.163.com/user/home?id=328902811	CMJ
9	https://music.163.com/user/home?id=3240550060	郭静
10	https://music.163.com/user/home?id=2688170	银临
11	https://music.163.com/user/home?id=558653866	时间不够以后
12	https://music.163.com/user/home?id=250310027	Hayui海力
13	https://music.163.com/user/home?id=106523441	结冰水
14	https://music.163.com/user/home?id=421535995	Quinn葵因
15	https://music.163.com/user/home?id=270625553	程安
16	https://music.163.com/user/home?id=1525492313	宋美阅
17	https://music.163.com/user/home?id=1360962967	马也_Crabbit
18	https://music.163.com/user/home?id=86104955	Aricdontluv
19	https://music.163.com/user/home?id=40513452	徐远书
20	https://music.163.com/user/home?id=912583	AY楊倦叁
21	https://music.163.com/user/home?id=320958360	张雪飞
22	https://music.163.com/user/home?id=129086920	文兆杰
23	https://music.163.com/user/home?id=402563640	林达浪
24	https://music.163.com/user/home?id=1499458762	椅子不够酷
25	https://music.163.com/user/home?id=335940342	Mai
26	https://music.163.com/user/home?id=134899812	徐梓淳
27	https://music.163.com/user/home?id=415207075	浦东老农民
28	https://music.163.com/user/home?id=113910883	胡期皓
29	https://music.163.com/user/home?id=334310904	锦零
30	https://music.163.com/user/home?id=83956391	HARIKIRI
31	https://music.163.com/user/home?id=265841584	KnowKnow
32	https://music.163.com/user/home?id=1306433963	是你的珪

就绪 100%

分列

连接

文件 开始 插入 数据 数据工具 预测

获取和转换 连接 排序和筛选 数据工具 预测

E2 : X ✓ f = "https://music.163.com/#/user/follows?" & D2

	C	D	E	F
1	字段1_链接			
2	https://music.163.com/user/home	id=109349540	https://music.163.com/#/user/follows?id=109349540	
3	https://music.163.com/user/home	id=9814155	https://music.163.com/#/user/follows?id=9814155	
4	https://music.163.com/user/home	id=542203503	https://music.163.com/#/user/follows?id=542203503	
5	https://music.163.com/user/home	id=474348590	https://music.163.com/#/user/follows?id=474348590	
6	https://music.163.com/user/home	id=550065289	https://music.163.com/#/user/follows?id=550065289	
7	https://music.163.com/user/home	id=396416696	https://music.163.com/#/user/follows?id=396416696	
8	https://music.163.com/user/home	id=328902811	https://music.163.com/#/user/follows?id=328902811	
9	https://music.163.com/user/home	id=3240550060	https://music.163.com/#/user/follows?id=3240550060	
10	https://music.163.com/user/home	id=2688170	https://music.163.com/#/user/follows?id=2688170	
11	https://music.163.com/user/home	id=558653866	https://music.163.com/#/user/follows?id=558653866	
12	https://music.163.com/user/home	id=250310027	https://music.163.com/#/user/follows?id=250310027	
13	https://music.163.com/user/home	id=106523441	https://music.163.com/#/user/follows?id=106523441	
14	https://music.163.com/user/home	id=421535995	https://music.163.com/#/user/follows?id=421535995	
15	https://music.163.com/user/home	id=270625553	https://music.163.com/#/user/follows?id=270625553	
16	https://music.163.com/user/home	id=1525492313	https://music.163.com/#/user/follows?id=1525492313	
17	https://music.163.com/user/home	id=1360962967	https://music.163.com/#/user/follows?id=1360962967	
18	https://music.163.com/user/home	id=86104955	https://music.163.com/#/user/follows?id=86104955	
19	https://music.163.com/user/home	id=40513452	https://music.163.com/#/user/follows?id=40513452	
20	https://music.163.com/user/home	id=912583	https://music.163.com/#/user/follows?id=912583	
21	https://music.163.com/user/home	id=320958360	https://music.163.com/#/user/follows?id=320958360	
22	https://music.163.com/user/home	id=129086920	https://music.163.com/#/user/follows?id=129086920	
23	https://music.163.com/user/home	id=402563640	https://music.163.com/#/user/follows?id=402563640	
24	https://music.163.com/user/home	id=1499458762	https://music.163.com/#/user/follows?id=1499458762	
25	https://music.163.com/user/home	id=335940342	https://music.163.com/#/user/follows?id=335940342	
26	https://music.163.com/user/home	id=134899812	https://music.163.com/#/user/follows?id=134899812	
27	https://music.163.com/user/home	id=415207075	https://music.163.com/#/user/follows?id=415207075	
28	https://music.163.com/user/home	id=113910883	https://music.163.com/#/user/follows?id=113910883	

就绪 100%



## 2 爬取云音乐相关数据

**规则3**，循环92位用户页面网址，对于每位用户循环其所有关注的用户信息

配置抓取模板 (请点击你要抓取的数据)

字段名称	提取到的数据	找不到如何处理
字段1_文本_文本	Tank_Lu_	该字段留空
字段1_链接_链接	https://music.163.com/user/home?...	该字段留空
页面网址	https://music.163.com/#/user/follo...	该字段留空
页面标题	网易云音乐	该字段留空

高级选项

触发器

添加特殊字段

确定

网易云音乐

操作提示  
请选择页面元素。  
查看采集流程

用户名	动态	关注	粉丝
Tank Lu	动态0	关注4	粉丝136734
一支一榴蓮	动态53	关注177	粉丝915466
卫一名	动态9	关注23	粉丝2484
许嵩	动态13	关注0	粉丝4698511
wowdemxtia			

# 3 清洗数据、构建网络

页面网址	A的ID
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540
<a href="https://music.163.com/#/user/follows?id=109349540">https://music.163.com/#/user/follows?id=109349540</a>	109349540

关注



A	B	C
B	B	B的ID
炸鸡少女阿肆	<a href="https://music.163.com/user/home?id=73125610">https://music.163.com/user/home?id=73125610</a>	73125610
Tank_Lu_	<a href="https://music.163.com/user/home?id=4990043880">https://music.163.com/user/home?id=4990043880</a>	4990043880
一支一支榴莲	<a href="https://music.163.com/user/home?id=1649808342">https://music.163.com/user/home?id=1649808342</a>	1649808342
许嵩	<a href="https://music.163.com/user/home?id=31265745">https://music.163.com/user/home?id=31265745</a>	31265745
卫一名	<a href="https://music.163.com/user/home?id=388865241">https://music.163.com/user/home?id=388865241</a>	388865241
橘子海-OrangeOcean	<a href="https://music.163.com/user/home?id=109698685">https://music.163.com/user/home?id=109698685</a>	109698685
wowdemxntia	<a href="https://music.163.com/user/home?id=3267561367">https://music.163.com/user/home?id=3267561367</a>	3267561367
谭禧龙	<a href="https://music.163.com/user/home?id=435244105">https://music.163.com/user/home?id=435244105</a>	435244105
葛东琪	<a href="https://music.163.com/user/home?id=91724921">https://music.163.com/user/home?id=91724921</a>	91724921
惟安娜-Vienna-	<a href="https://music.163.com/user/home?id=52829347">https://music.163.com/user/home?id=52829347</a>	52829347
SuperLuckyQi	<a href="https://music.163.com/user/home?id=288477618">https://music.163.com/user/home?id=288477618</a>	288477618
EdSheeran	<a href="https://music.163.com/user/home?id=416608258">https://music.163.com/user/home?id=416608258</a>	416608258
張震嶽	<a href="https://music.163.com/user/home?id=5158334">https://music.163.com/user/home?id=5158334</a>	5158334
BrunoMars	<a href="https://music.163.com/user/home?id=1671465495">https://music.163.com/user/home?id=1671465495</a>	1671465495
金玟岐	<a href="https://music.163.com/user/home?id=9814155">https://music.163.com/user/home?id=9814155</a>	9814155
Keshimusic	<a href="https://music.163.com/user/home?id=3827086435">https://music.163.com/user/home?id=3827086435</a>	3827086435
mrbrunomajor	<a href="https://music.163.com/user/home?id=1409309284">https://music.163.com/user/home?id=1409309284</a>	1409309284
WeAreVarious	<a href="https://music.163.com/user/home?id=75388755">https://music.163.com/user/home?id=75388755</a>	75388755
er呆酱	<a href="https://music.163.com/user/home?id=260930930">https://music.163.com/user/home?id=260930930</a>	260930930
TaylorSwift	<a href="https://music.163.com/user/home?id=1880071427">https://music.163.com/user/home?id=1880071427</a>	1880071427
ShawnMendesCN	<a href="https://music.163.com/user/home?id=3773216955">https://music.163.com/user/home?id=3773216955</a>	3773216955
蛙池WaChi	<a href="https://music.163.com/user/home?id=73884324">https://music.163.com/user/home?id=73884324</a>	73884324
笛呆子囚牛	<a href="https://music.163.com/user/home?id=358189202">https://music.163.com/user/home?id=358189202</a>	358189202
茄子蛋EggPlantEgg	<a href="https://music.163.com/user/home?id=590126810">https://music.163.com/user/home?id=590126810</a>	590126810
裘德Chiu	<a href="https://music.163.com/user/home?id=98087305">https://music.163.com/user/home?id=98087305</a>	98087305
glassanimalsband	<a href="https://music.163.com/user/home?id=3718571391">https://music.163.com/user/home?id=3718571391</a>	3718571391
溺溺__	<a href="https://music.163.com/user/home?id=85065212">https://music.163.com/user/home?id=85065212</a>	85065212
悶餅MOONBAND	<a href="https://music.163.com/user/home?id=342197871">https://music.163.com/user/home?id=342197871</a>	342197871
傻子與白痴Foolandldio...	<a href="https://music.163.com/user/home?id=1456859256">https://music.163.com/user/home?id=1456859256</a>	1456859256
西彬呀	<a href="https://music.163.com/user/home?id=323445735">https://music.163.com/user/home?id=323445735</a>	323445735
OneRepublic_CN	<a href="https://music.163.com/user/home?id=1924705910">https://music.163.com/user/home?id=1924705910</a>	1924705910
棱镜乐队	<a href="https://music.163.com/user/home?id=6356356">https://music.163.com/user/home?id=6356356</a>	6356356
动物朋友红子户内队	<a href="https://music.163.com/user/home?id=124108424">https://music.163.com/user/home?id=124108424</a>	124108424



# 3 清洗数据、构建网络

A的ID	B的ID
109349540	73125610
109349540	4990043880
109349540	1649808342
109349540	31265745
109349540	388865241
109349540	109698685
109349540	3267561367
109349540	435244105
109349540	91724921
109349540	52829347
109349540	288477618
109349540	416608258
109349540	5158334
109349540	1671465495
109349540	9814155
109349540	3827086435
109349540	1409309284
109349540	75388755
109349540	260930930
109349540	1880071427
109349540	3773216955
109349540	73884324
109349540	358189202
109349540	590126810
109349540	98087305
109349540	3718571391
109349540	85065212
109349540	342197871
109349540	1456859256
109349540	323445735
109349540	1924705910
109349540	6356356

建立  
A(音乐人)→  
B(关注的人)  
的网络

## 大网络

"A B 1"格式，表示A节点为源节点，B为目标节点，边的权重为1；  
导入Gephi/pajek即可绘制网络。

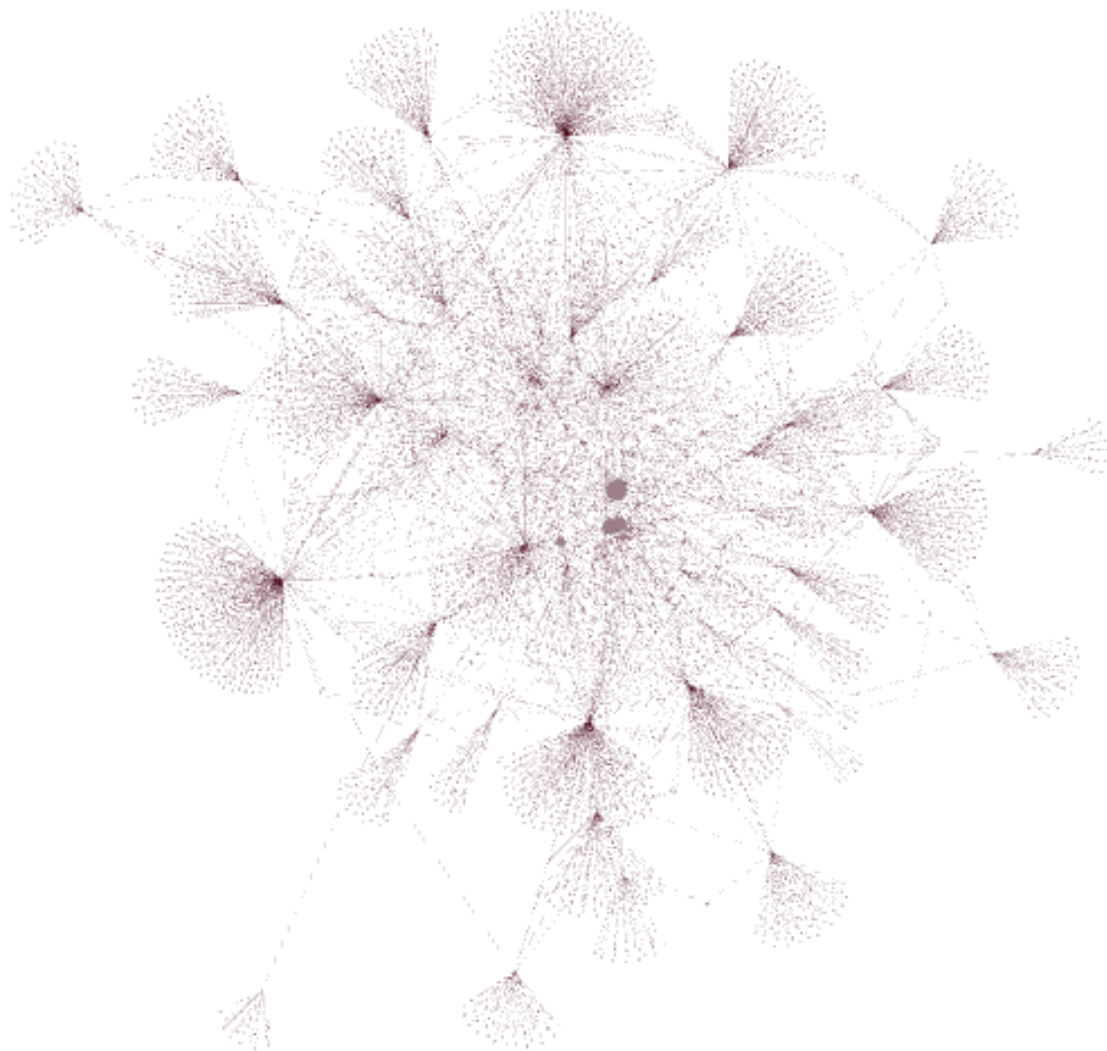
## 小网络

A（源节点）、B（目标节点）的ID两列保存在Sheet2  
Step1:如果Sheet2第j行第2列中ID不在Sheet2第2列中，则删除第j行；  
Step2:根据关注关系，构建 $n(A) \times n(A)$ 的矩阵；  
导入Gephi/pajek即可绘制网络



# 3 清洗数据、构建网络

## 大网络



# 3 清洗数据、构建网络

## 小网络

Step1: 如果B列中ID不在A列中, 则删除该行;

将A (源节点, 音乐人) 的信息复制到 Sheet3)



A	B	C
1	109349540	Todd Li
2	9814155	金玟岐
3	542203503	郑润泽
4	474348590	夏日入侵企画
5	550065289	要不要买菜
6	396416696	ODD陈思键
7	328902811	CMJ
8	3240550060	郭静
9	2688170	银临
10	558653866	时间不够以后
11	250310027	Hayrul海力
12	106523441	结冰水
13	421535995	Quinn葵因
14	270625553	程安
15	1525492313	宋美阅
16	1360962967	马也_Crabbit
17	86104955	Aricdontliuv
18	40513452	徐远书
19	912583	AY楊佬叁
20	320958360	张雪飞
21	129086920	文兆杰
22	402563640	林达浪
23	1499458762	椅子不够酷
24	335940342	Mai
25	134899812	徐梓淳
26	415207075	浦东老农民
27	113910883	胡期皓
28	334310904	锦零
29	83956391	HARIKIRI

```
3个人页面关注.xlsm - 模块1 (代码)
(通用) 删除B非100成员

Sub 删除B非100成员()
Dim arr() As Double '定义动态数组
Dim n As Long
Dim jj As Double
n = Sheet3.Range("A65535").End(xlUp).Row '根据A列数据重新定义数组
ReDim arr(1 To n) As Double
For i = 1 To n '给数组赋值
arr(i) = Sheet3.Cells(i, 2)
Next
nrow = Sheet2.Range("A65535").End(xlUp).Row
For j = nrow To 2 Step -1
jj = Sheet2.Cells(j, 2)
ii = Application.Match(CDbl(jj), Array(arr), 0) '判断是否属于原创音乐人
If IsError(ii) Then Sheet2.Rows(j).Delete '如果不属于原创音乐人则删除行
Next
End Sub
```

```
Dim arr() As Double
Dim n As Long
Dim jj As Double
n = Sheet3.Range("A65535").End(xlUp).Row
ReDim arr(1 To n) As Double
For i = 1 To n
arr(i) = Sheet3.Cells(i, 2)
Next
nrow = Sheet2.Range("A65535").End(xlUp).Row
For j = nrow To 2 Step -1
jj = Sheet2.Cells(j, 2)
ii = Application.Match(CDbl(jj), Array(arr), 0)
If IsError(ii) Then Sheet2.Rows(j).Delete
Next
```





# 3 清洗数据、构建网络

## 小网络

Step2:根据关注关系，构建 $n(A) \times n(A)$ 的矩阵；

```
3个人页面关注.xlsm - 模块2 (代码)
(通用) 网络
Sub 网络()
Dim arr() As Double
Dim n As Long
Dim jj As Double
n = Sheet3.Range("A65535").End(xlUp).Row
ReDim arr(1 To n) As Double
For i = 1 To n
arr(i) = Sheet3.Cells(i, 2)
Next
For ii = 2 To Sheet2.Range("A65535").End(xlUp).Row
i1 = Sheet3.Application.Match(CDbl(Sheet2.Cells(ii, 1)), Array(arr), 0)
j1 = Sheet3.Application.Match(CDbl(Sheet2.Cells(ii, 2)), Array(arr), 0)
Sheet4.Cells(i1 + 1, j1 + 1).Value = Sheet4.Cells(i1 + 1, j1 + 1).Value + 1
Next
End Sub
```

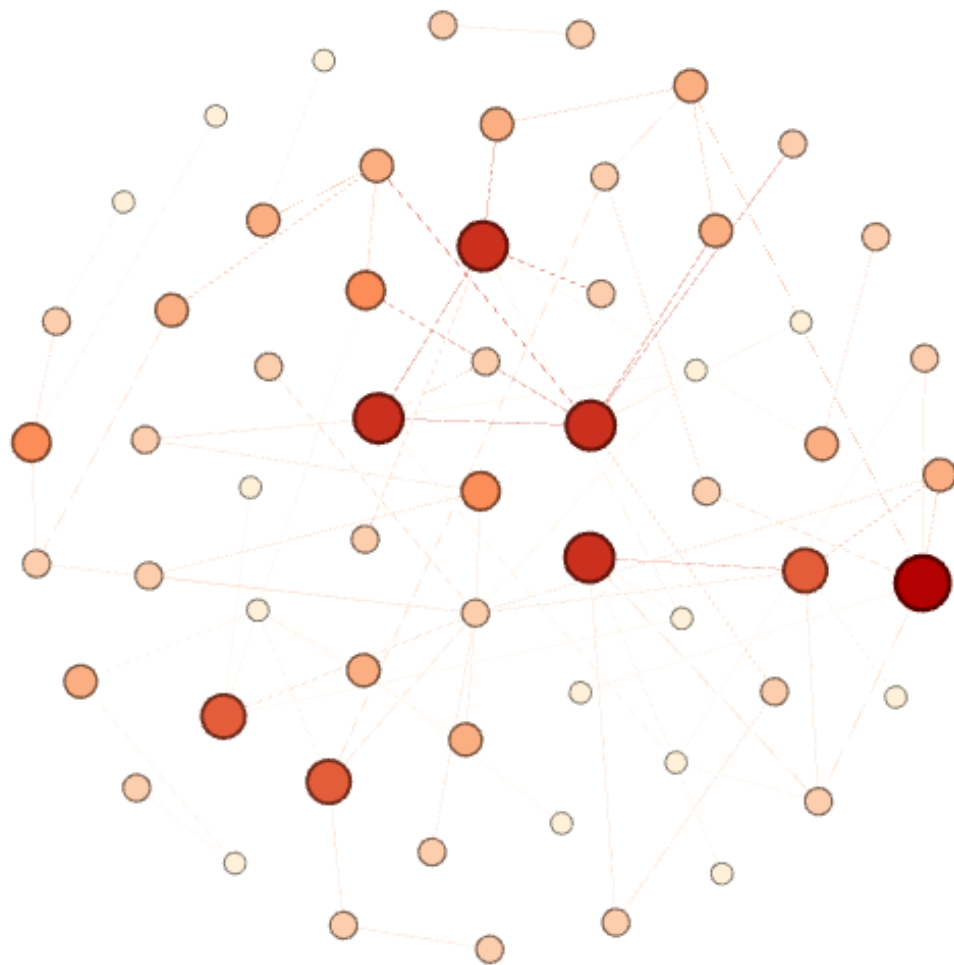
```
Dim arr() As Double
Dim n As Long
Dim jj As Double
n = Sheet3.Range("A65535").End(xlUp).Row
ReDim arr(1 To n) As Double
For i = 1 To n
arr(i) = Sheet3.Cells(i, 2)
Next
For ii = 2 To Sheet2.Range("A65535").End(xlUp).Row
i1 = Sheet3.Application.Match(CDbl(Sheet2.Cells(ii, 1)), Array(arr), 0)
j1 = Sheet3.Application.Match(CDbl(Sheet2.Cells(ii, 2)), Array(arr), 0)
Sheet4.Cells(i1 + 1, j1 + 1).Value = Sheet4.Cells(i1 + 1, j1 + 1).Value + 1
Next
```



# 3 清洗数据、构建网络

## 小网络

A	B	C	D	E	F	G	H	I	J	K	L
	1	2	3	4	5	6	7	8	9	10	11
1		1		1							
2											
3		1									
4	1										
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											1





谢谢