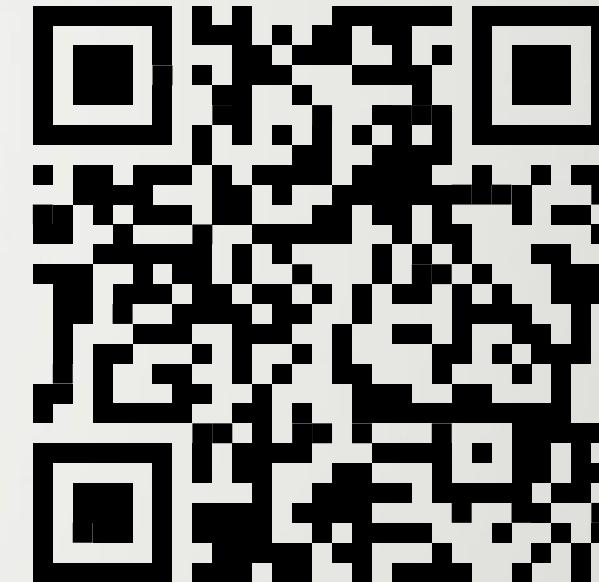


Psychoinformatics & Neuroinformatics



Week 3 Web APIs



by Tsung-Ren (Tren) Huang 黃從仁

What are API & SDK?

API = Application Programming Interface ~ functions

SDK = Software Development Kit = A collection of APIs



Interfaces of
the Black Box

Software/Hardware
Resource Black Box

Data scientists need to use/make APIs?

Is Data Science Dying in 2022?



<https://www.youtube.com/watch?v=rqvyWUODZGE&t=705s>

Why are APIs Important for Data Science?



<https://www.youtube.com/watch?v=s1gD35Z4eUc&t=98s>

Behavioral scientists need to use/make APIs?

The future of human behaviour research

Human behaviour is complex and multifaceted, and is studied by a broad range of disciplines across the social and natural sciences. To mark our 5th anniversary, we asked leading scientists in some of the key disciplines that we cover to share their vision of the future of research in their disciplines. Our contributors underscore how important it is to broaden the scope of their disciplines to increase ecological validity and diversity of representation, in order to address pressing societal challenges that range from new technologies, modes of interaction and sociopolitical upheaval to disease, poverty, hunger, inequality and climate change. Taken together, these contributions highlight how achieving progress in each discipline will require incorporating insights and methods from others, breaking down disciplinary silos.

You need to *use* APIs to get real-world data collected *by others*.
You need to *make* APIs to collect real-world data *by yourself*.

Goals for today

Learning APIs of social media

E.g., Reddit & Twitter

Learning APIs for data analytics

E.g., Google APIs & Azure APIs

Inspired to learn other APIs

E.g., LINE & Telegram



Goals for today

Learning APIs of social media

E.g., Reddit & Twitter

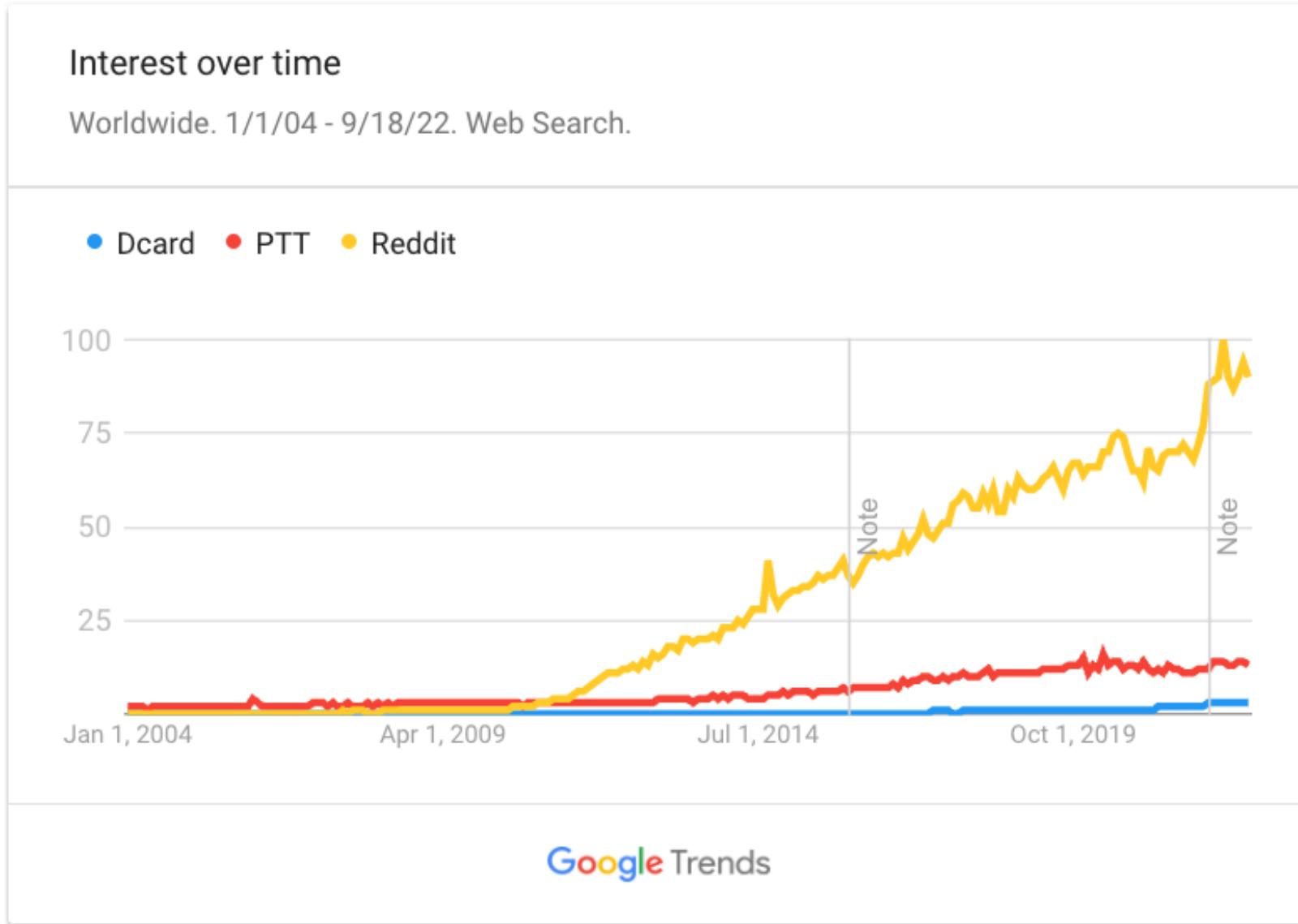
Learning APIs for data analytics

E.g., Google APIs & Azure APIs

Inspired to learn other APIs

E.g., LINE & Telegram

Goodbye Dcard & PTT



Reddit & Subreddits

The image shows a split-screen view of the Reddit website. On the left, the main Reddit homepage is displayed with various posts and a search bar at the top. A search results dropdown menu is open, showing several subreddits related to 'taiwan'. On the right, the specific subreddit page for 'r/taiwan' is shown, titled 'Welcome to Taiwan!'. This page includes a 'Create Post' button, navigation links for 'Posts', 'Wiki', 'Rules', and 'Subcommunities', and a list of pinned posts. One pinned post discusses a bridge collapse in Taiwan due to an earthquake.

https://www.reddit.com

reddit Home

taiwan

r/taiwan Community • 178k members

r/taiwanica Community • 3.7k members

r/Taiwancirclejerk Community • 2.6k members

r/TaiwanPics Community • 5.9k members

r/taiwandramas Community • 2.0k members

Create Post

TA 6 got leaked, talking abc TALK 48 in u/UsaHamb...

Best Hot New

r/WearOS • Posted by u/Wild-Theo
This is normal right? Support

Watch 43% - approx. 100%

Search for "taiwan"

/r/taiwan: Welcome to Taiwan!

r/taiwan

Posts Wiki Rules Subcommunities

Create Post

Hot New Top ...

推噓 PINNED BY MODERATORS
20 Posted by u/AutoModerator 18 days ago
Discussion Monthly Travel, Questions, & Mandarin Thread
541 Comments Award Share Save ...

推噓
Posted by u/CastleNorsk 台東 - Taitung 8 hours ago
News bridge collapsed from 7.2 Earthquake today. Apartment complex collapsed in Hualien as well.

Reddit APIs



API methods

[by section](#) [by oauth scope](#)

account

/api/v1/me
/api/v1/me/blocked
/api/v1/me/friends
/api/v1/me/karma
/api/v1/me/prefs
/api/v1/me/trophies
/prefs/blocked
/prefs/friends
/prefs/messaging
/prefs/trusted
/prefs/where

oauth
oauth

captcha

/api/needs_captcha

oauth

collections

/api/v1/collections/add_post_to_collection
/api/v1/collections/collection oauth
/api/v1/collections/create_collection
/api/v1/collections/delete_col oauth
/api/v1/collections/follow_col oauth
/api/v1/collections/remove_p_oauth_collection
/api/v1/collections/reorder_c_oauth_in
/api/v1/collections/subreddit_oauth_tions

This is automatically-generated documentation for the reddit API.

Please take care to respect our [API access rules](#).

overview

listings

Many endpoints on reddit use the same protocol for controlling pagination. These endpoints are called Listings and share five common parameters: `after`, `before`, `limit`, `count`, and `show`.

Listings do not use page numbers because their content changes so frequently. They allow you to view slices of the underlying data. Listing JSON responses have `after` and `before` fields which are equivalent to the "next" and "prev" buttons on the site and in combination with `count` can be used to page through the

The common parameters are as follows:

- `after` / `before` - only one should be specified. These indicate the item in the listing to use as the anchor point of the slice.
- `limit` - the maximum number of items to return in this slice of the listing.
- `count` - the number of items already seen in this listing. The JSON builder uses this to determine when to give values for `before` and `after` in the response.
- `show` - optional parameter; if `all` is passed, filters such as "hide" and "hide voted on" will be disabled.

To page through a listing, start by fetching the first page without specifying `after` and `count`. The response will contain an `after` value which you can use in the next request. It is a good idea, but not required, to send an updated `count` which should be the number of items already fetched.

GET [\[/r subreddit\]/hot](#) [read](#) [rss support](#)

This endpoint is a listing.

g

one of (GLOBAL, US, AR, AU, BG, CA, CL, CO, HR, CZ, FI, FR, DE, GR, HU, IS, IN, IE, IT, JP, MY, MX, NZ, PH, PL, PT, PR, RO, RS, SG, ES, SE, TW, TH, TR, GB, US_WA, US_DE, US_DC, US_WI, US_WV, US_HI, US_FL, US_WY, US_NH, US_NJ, US_NM, US_TX, US_LA, US_NC, US ND, US_NE, US_TN, US_NY, US_PA, US_CA, US_NV, US_VA, US_CO, US_AK, US_AL, US_AR, US_VT, US_IL, US_GA, US_IN, US_IA, US_OK, US_AZ, US_ID, US_CT, US_ME, US_MD, US_MA, US_OH, US_UT, US_MO, US_MN, US_MI, US_RI, US_KS, US_MT, US_MS, US_SC, US_KY, US_OR, US_SD)

after

fullname of a thing

before

fullname of a thing

count

a positive integer (default: 0)

limit

the maximum number of items desired (default: 25, maximum: 100)

show

(optional) the string all

sr_detail

(optional) expand subreddits

GET [\[/r subreddit\]/new](#) [read](#) [rss support](#)

This endpoint is a listing.

after

fullname of a thing

before

fullname of a thing

count

a positive integer (default: 0)

limit

the maximum number of items desired (default: 25, maximum: 100)

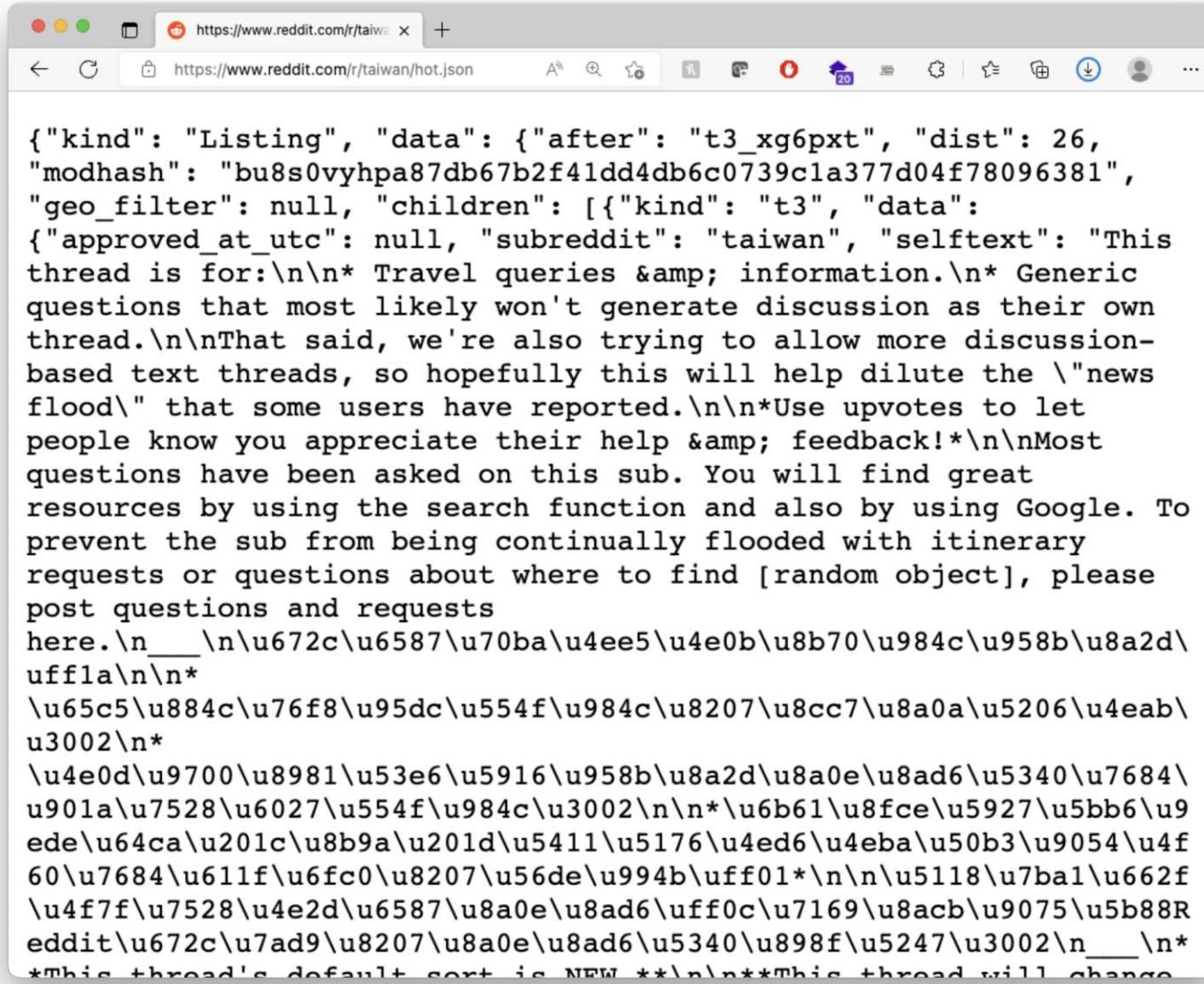
show

(optional) the string all

sr_detail

(optional) expand subreddits

JavaScript Object Notation (JSON)

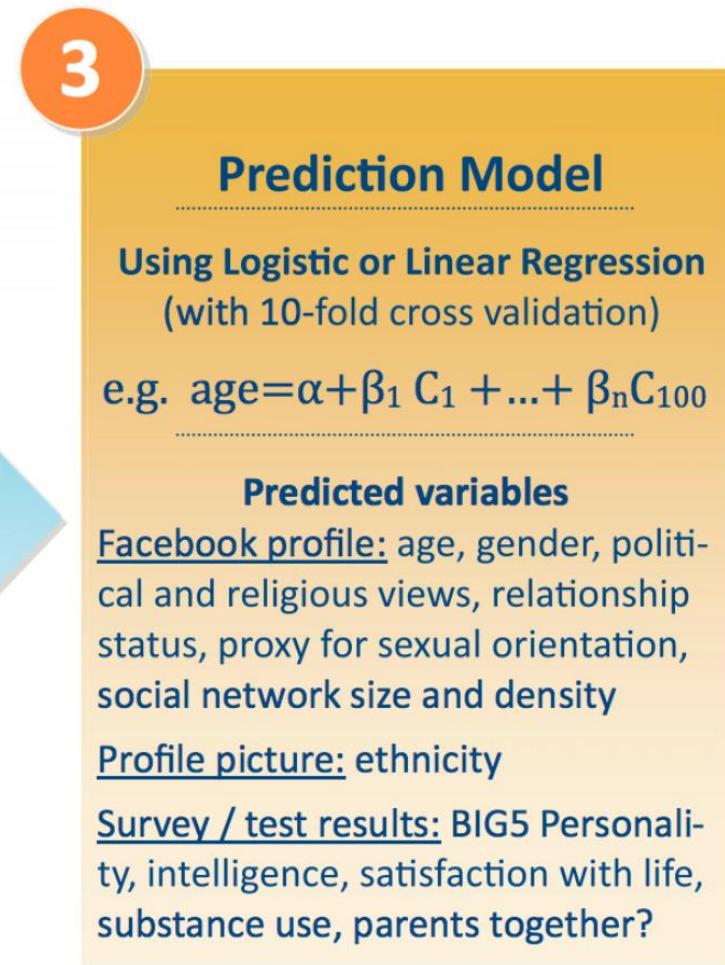
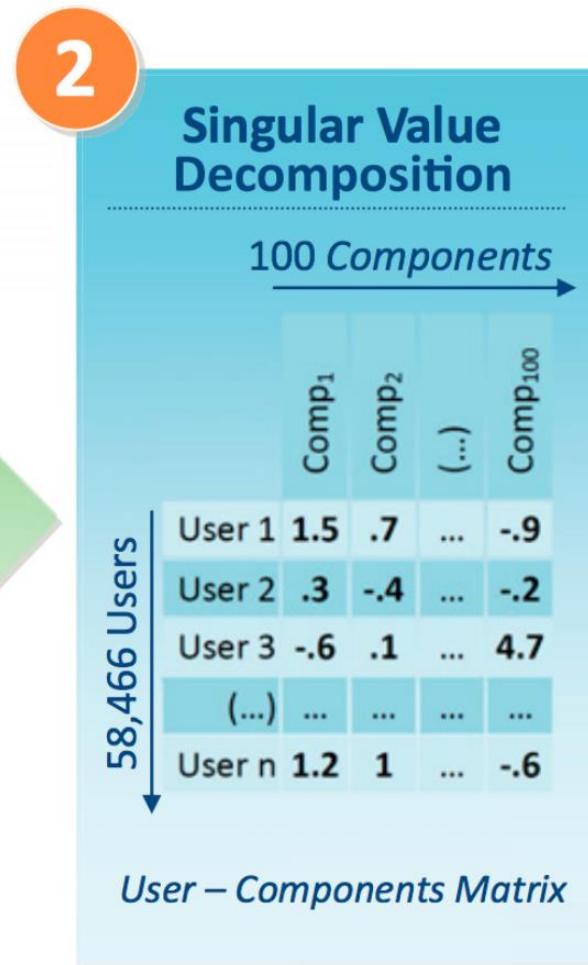
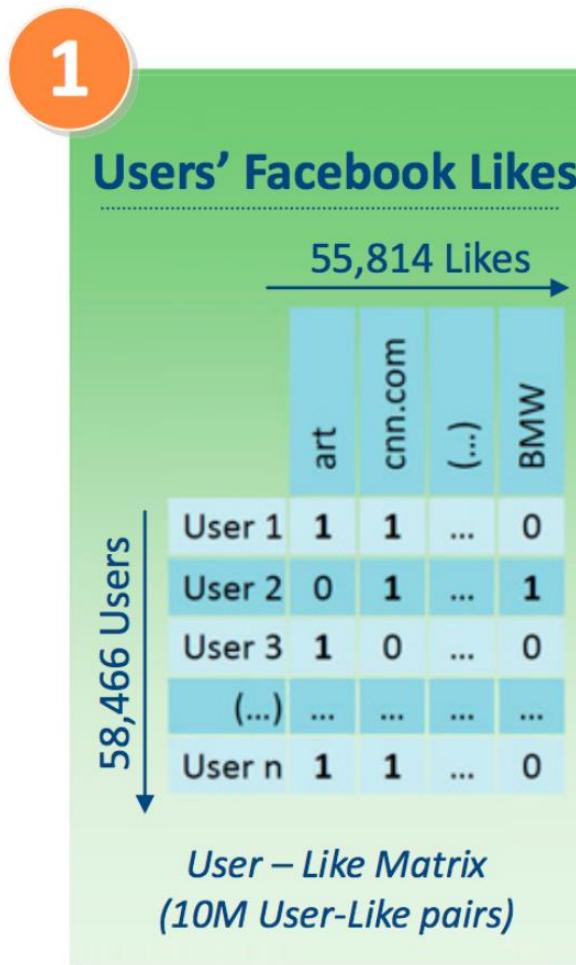


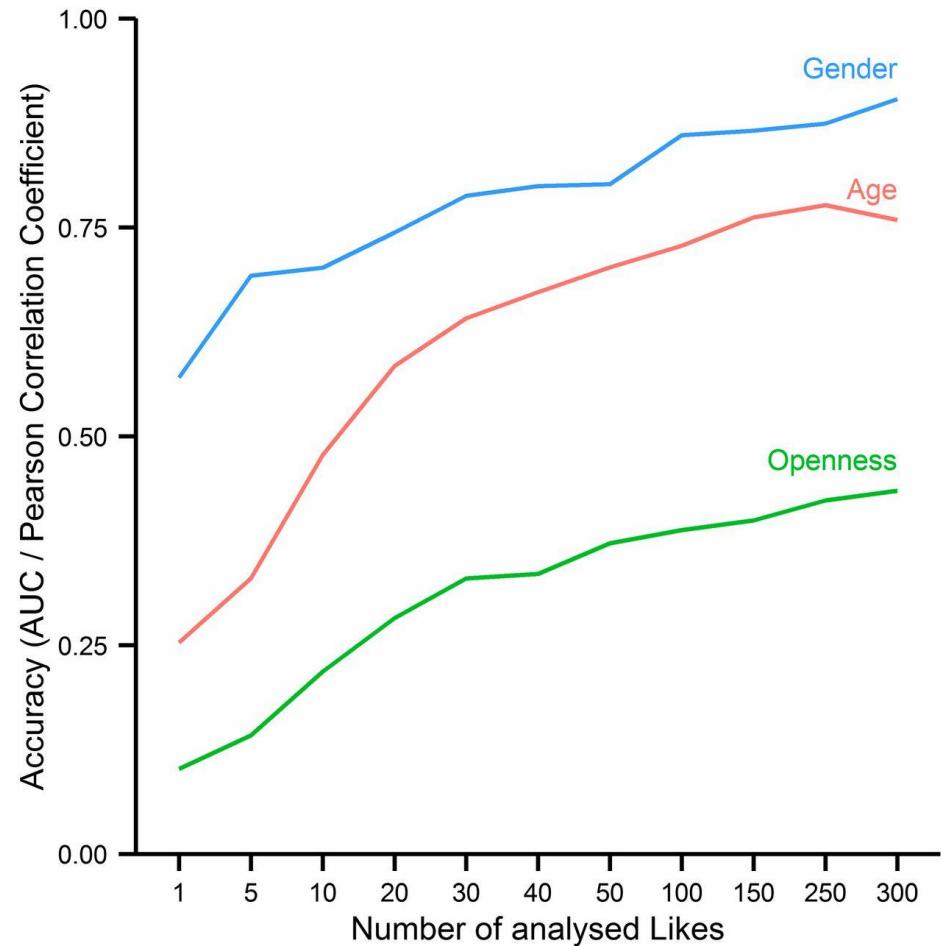
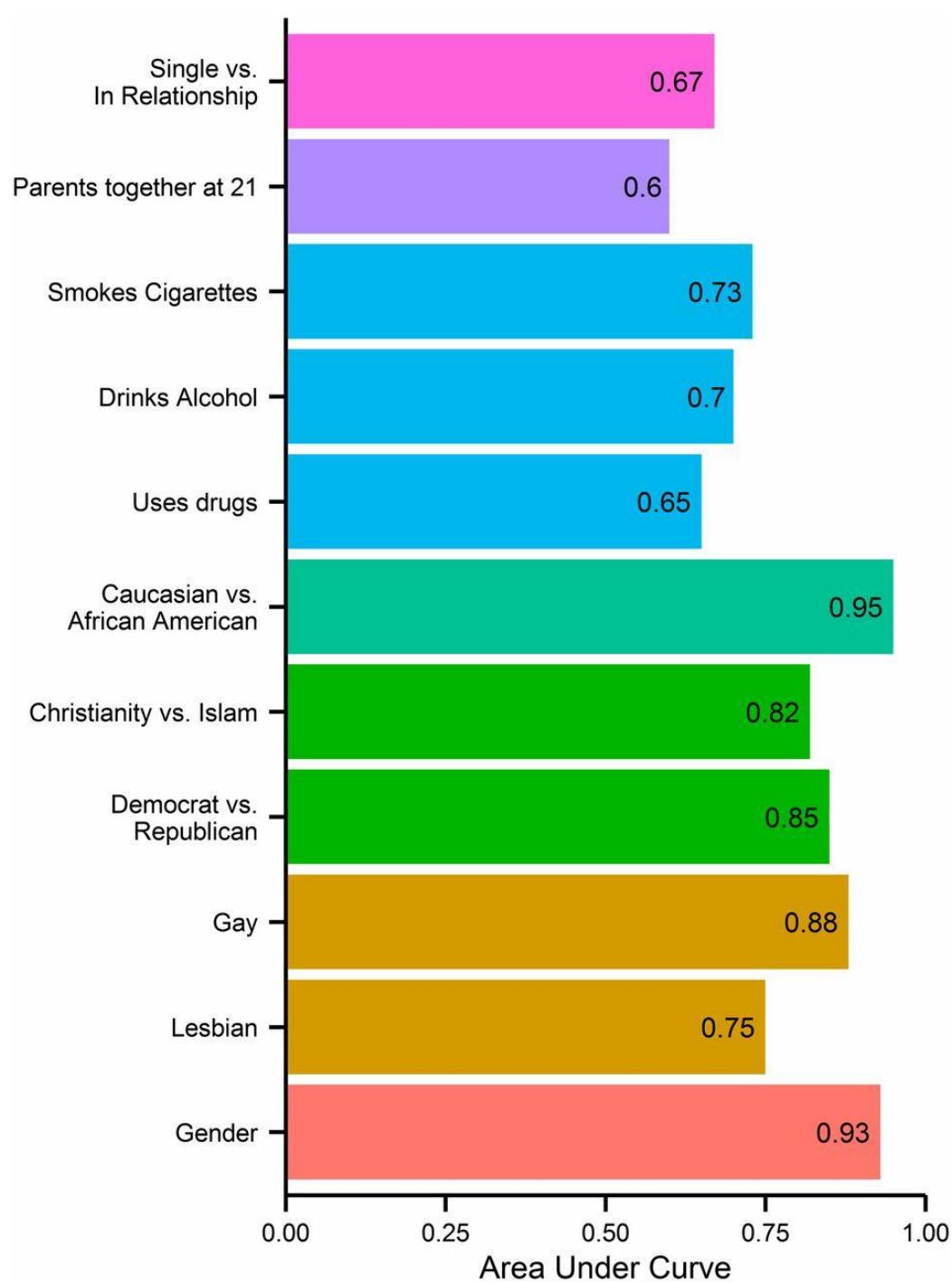
```
{"kind": "Listing", "data": {"after": "t3_xg6pxt", "dist": 26, "modhash": "bu8s0vyhpa87db67b2f41dd4db6c0739c1a377d04f78096381", "geo_filter": null, "children": [{"kind": "t3", "data": {"approved_at_utc": null, "subreddit": "taiwan", "selftext": "This thread is for:\n\n* Travel queries & information.\n* Generic questions that most likely won't generate discussion as their own thread.\n\nThat said, we're also trying to allow more discussion-based text threads, so hopefully this will help dilute the \"news flood\" that some users have reported.\n\n*Use upvotes to let people know you appreciate their help & feedback!\n\nMost questions have been asked on this sub. You will find great resources by using the search function and also by using Google. To prevent the sub from being continually flooded with itinerary requests or questions about where to find [random object], please post questions and requests here.\n\n\u202a\n\n\u672c\u6587\u70ba\u4ee5\u4e0b\u8b70\u984c\u958b\u8a2d\uff1a\n\n\u65c5\u884c\u76f8\u95dc\u554f\u984c\u8207\u8cc7\u8a0a\u5206\u4eab\u3002\n\n\u4e0d\u9700\u8981\u53e6\u5916\u958b\u8a2d\u8a0e\u8ad6\u5340\u7684\u901a\u7528\u6027\u554f\u984c\u3002\n\n\u64ca\u201c\u8b9a\u201d\u5411\u5176\u4ed6\u4eba\u50b3\u9054\u4f60\u7684\u611f\u6fc0\u8207\u56de\u994b\uuff01*\n\n\u5118\u7ba1\u662f\u4f7f\u7528\u4e2d\u6587\u8a0e\u8ad6\uuff0c\u7169\u8acb\u9075\u5b88redit\u672c\u7ad9\u8207\u8a0e\u8ad6\u5340\u898f\u5247\u3002\n\n*This thread's default sort is NEW *\n\n**This thread will change"}}
```

```
{
  "firstName": "John",
  "lastName": "Smith",
  "isAlive": true,
  "age": 27,
  "address": {
    "streetAddress": "21 2nd Street",
    "city": "New York",
    "state": "NY",
    "postalCode": "10021-3100"
  },
  "phoneNumbers": [
    {
      "type": "home",
      "number": "212 555-1234"
    },
    {
      "type": "office",
      "number": "646 555-4567"
    }
  ],
  "children": [
    "Catherine",
    "Thomas",
    "Trevor"
  ],
  "spouse": null
}
```

Facebook: Predictions by “likes” (1/3)

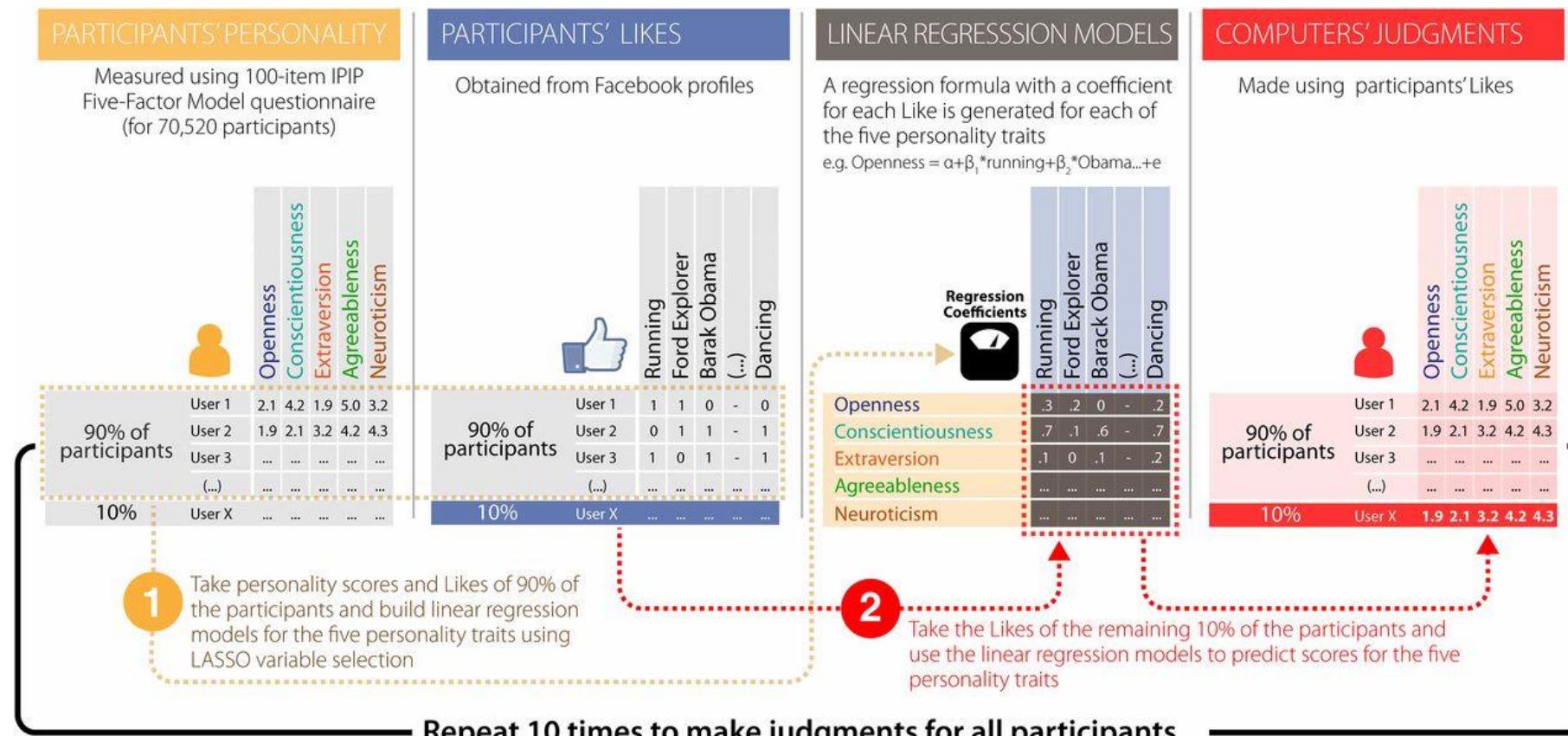
Private traits and attributes are predictable from digital records of human behavior





Facebook: Predictions by “likes” (2/3)

Computer-based personality judgments are more accurate than those made by humans



Repeat 10 times to make judgments for all participants



Humans' Judgments

Humans' Accuracy



Self-ratings

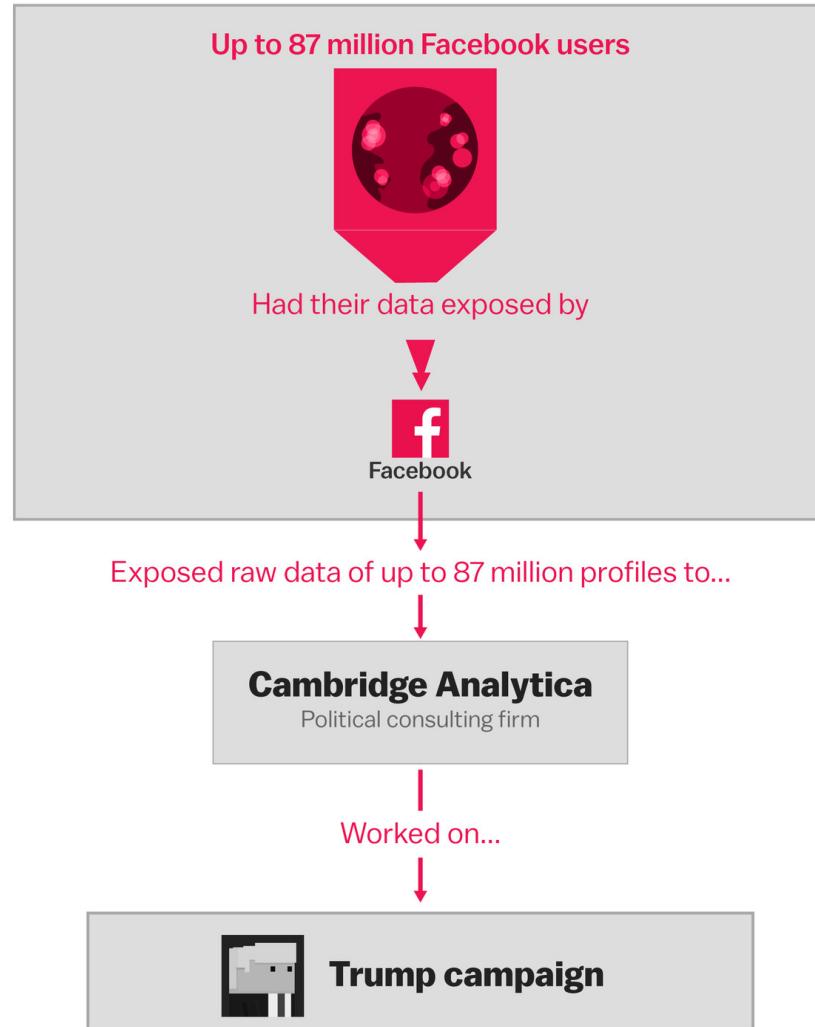
Computers' Accuracy



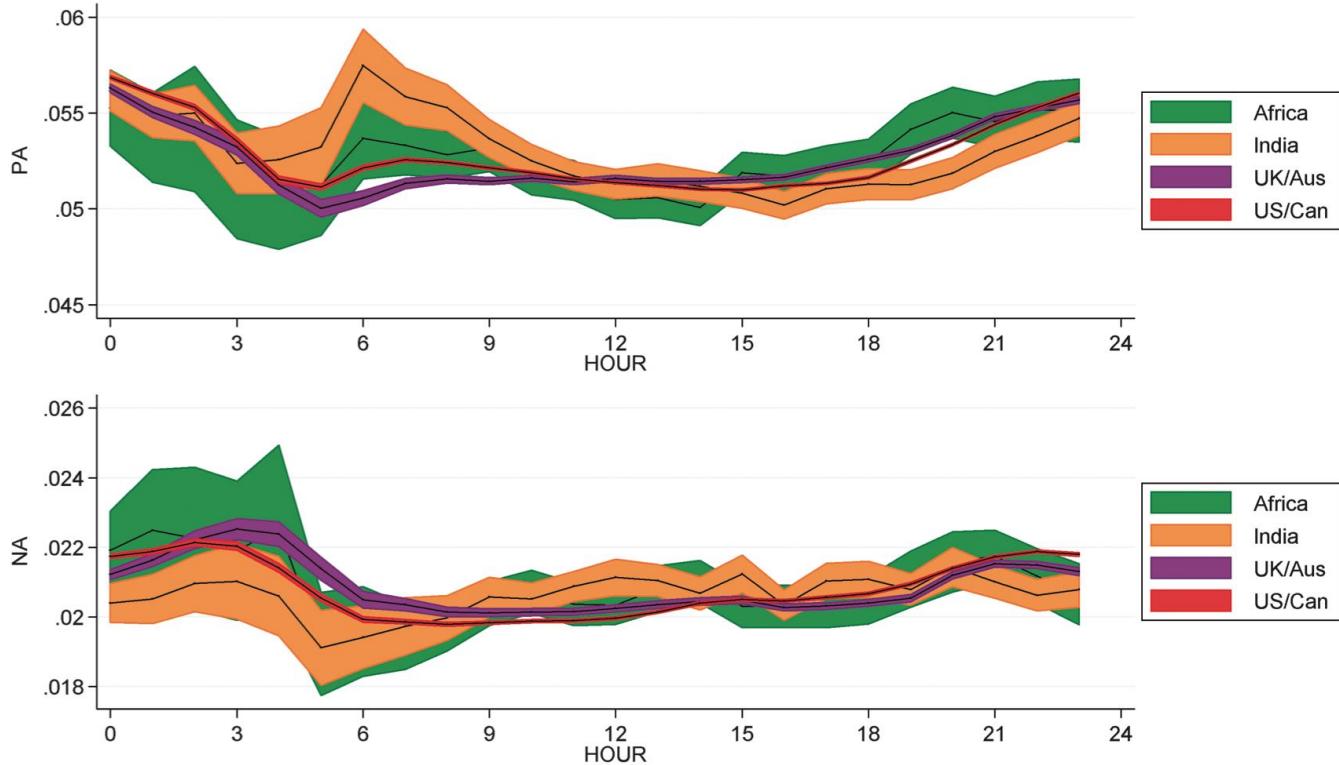
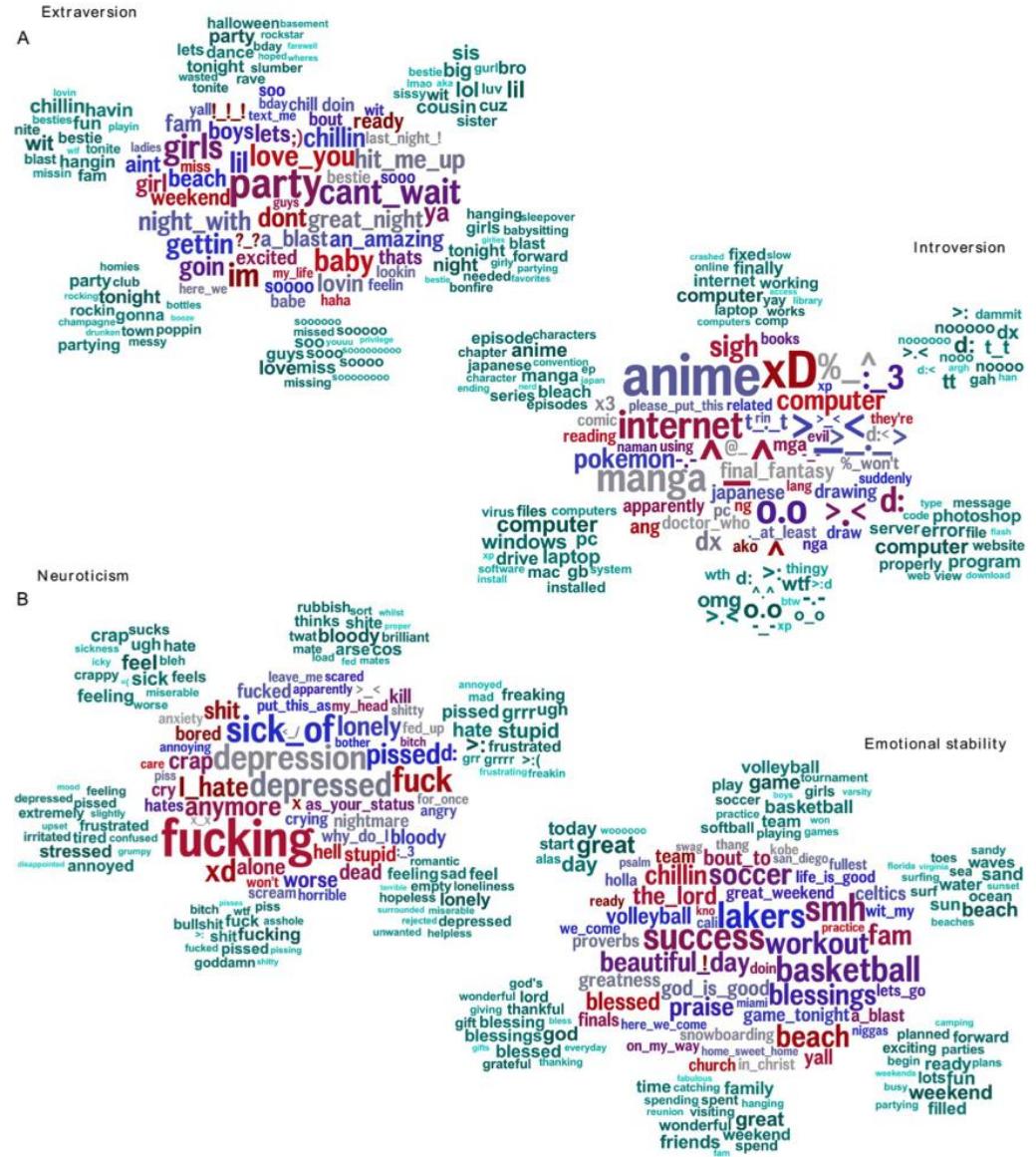
Computers' Judgments

Facebook: Predictions by “likes” (3/3)

This led to the scandal of Cambridge Analytica.



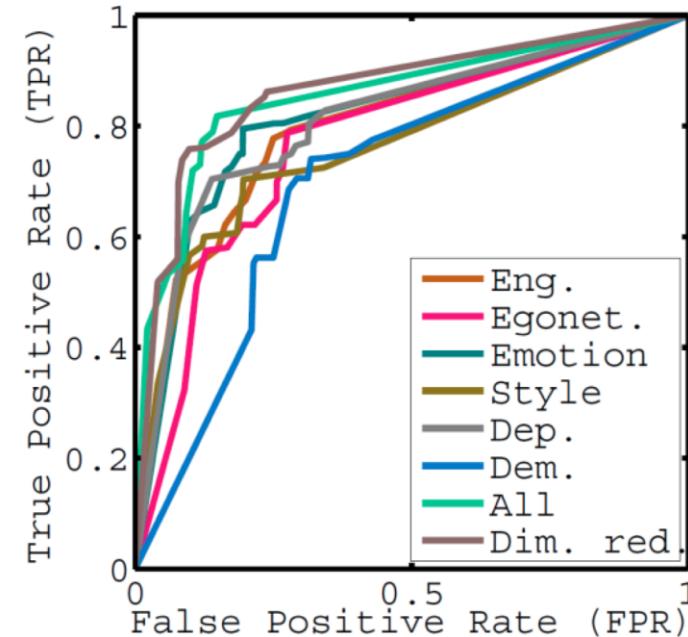
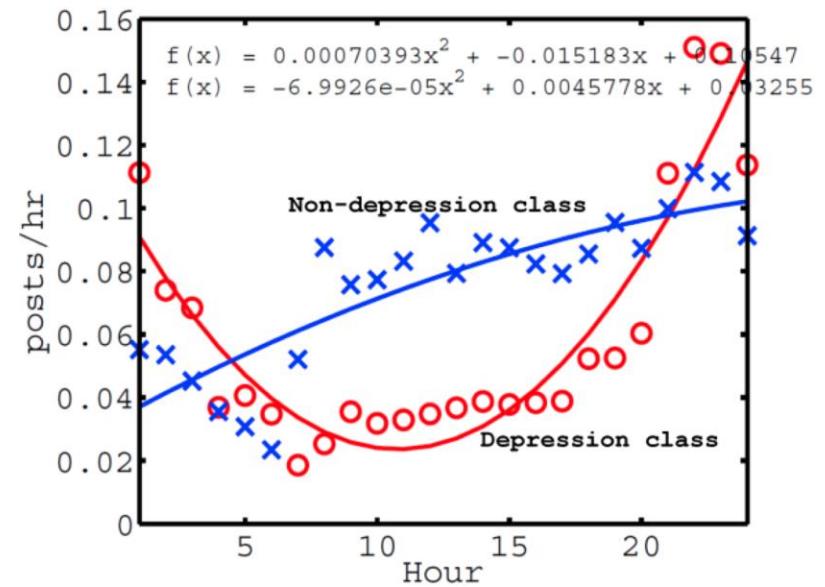
Twitter: Text Analysis



Twitter: Depression Detection

Depression-indicative posts	Standard posts
loser, depress*, lonely, sad, alone, weak, useless, life, imbalance, blame, problems, unsuccessful, suicidal, torture, safe, escape, worry, intimidat*, uncomfortable, therapy, medication, shit, pressure, conversation, hurts, myself, worth, break, nobody, mine, painful, hate, suck*	lol, work, weekend, say, friends, brilliant, follow, tips, bieber, love, amazing, hello, now, bored, awesome, beautiful, romantic, fuck*, perfect, excited, smile, meet, tonight, life, movie, football, favorite, sleepy, great, night, team, good, anyone, you, your, tomorrow, money

Egonetwork measures	Depres. class	Non-depres. class
#followers/inlinks	26.9 ($\sigma=78.3$)	45.32 ($\sigma=90.74$)
#followees/outlinks	19.2 ($\sigma=52.4$)	40.06 ($\sigma=63.25$)
Reciprocity	0.77 ($\sigma=0.09$)	1.364 ($\sigma=0.186$)
Prestige ratio	0.98 ($\sigma=0.13$)	0.613 ($\sigma=0.277$)
Graph density	0.01 ($\sigma=0.03$)	0.019 ($\sigma=0.051$)
Clustering coefficient	0.02 ($\sigma=0.05$)	0.011 ($\sigma=0.072$)
2-hop neighborhood	104 ($\sigma=82.42$)	198.4 ($\sigma=110.3$)
Embeddedness	0.38 ($\sigma=0.14$)	0.226 ($\sigma=0.192$)
#ego components	15.3 ($\sigma=3.25$)	7.851 ($\sigma=6.294$)



Twitter APIs: Needing authorization

Try this:

<https://twitter.com/search?q=台大>

<https://api.twitter.com/2/search/tweets.json?q=台大>

Application Settings

Keep the "Consumer Secret" a secret. This key should never be human-readable in your application.

Consumer Key (API Key) HDTBqZDAOuZJyDhsr5Z5tw

Consumer Secret (API
Secret) nKULI80bwwedY4jtk4UTt2dXotoIVOIPQ8fUVK2LDo

Your access token

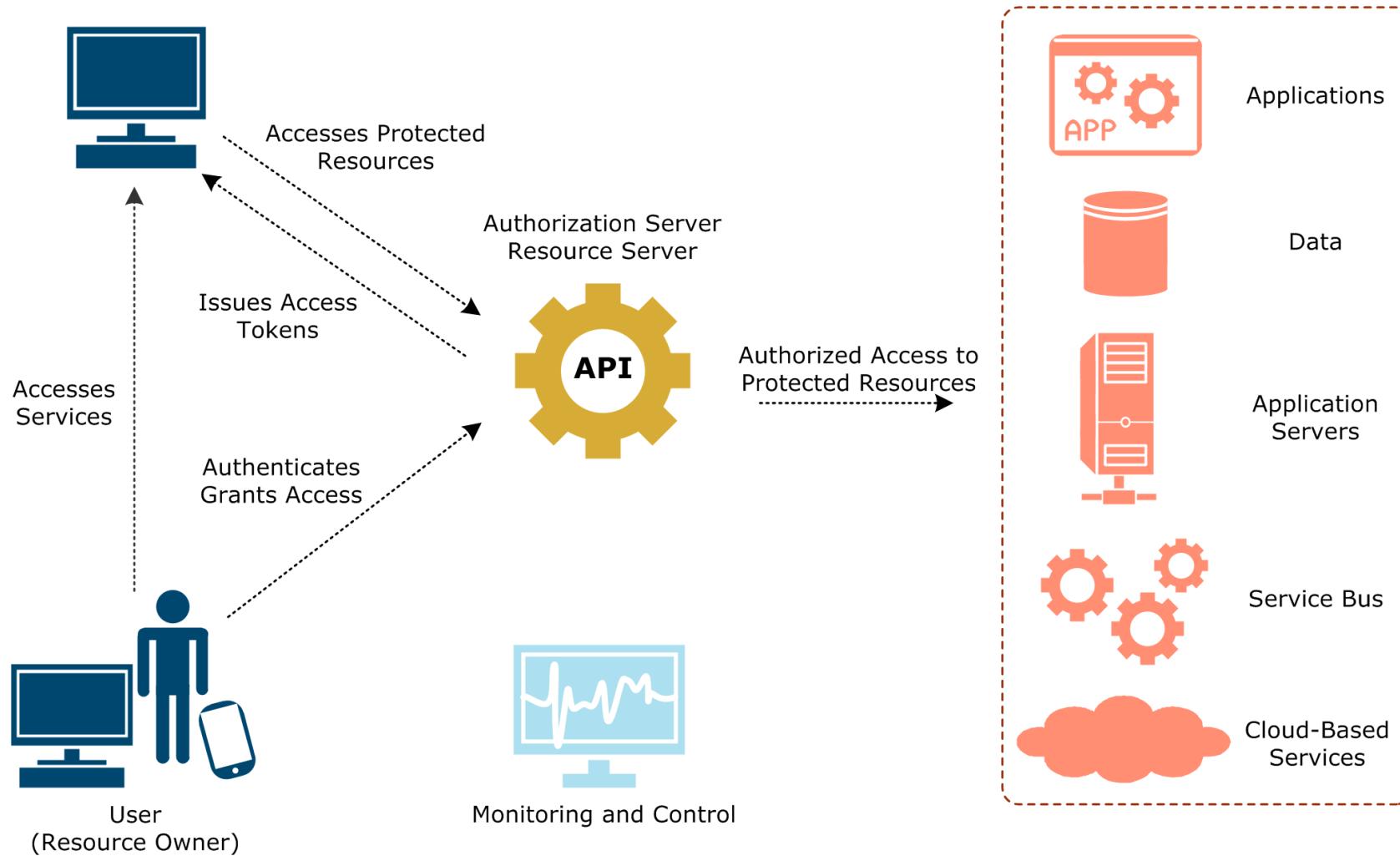
This access token can be used to make API requests on your own account's behalf. Do not share your access token secret with anyone.

Access token 206228745-LujHvkviaSuBq4FH2Unx92xvYFCBYtoArQknciLF

Access token secret AbuFKDs8oWSFMcbwUOq9D4E0Blx4dh8tfzvQ93Utndvjp

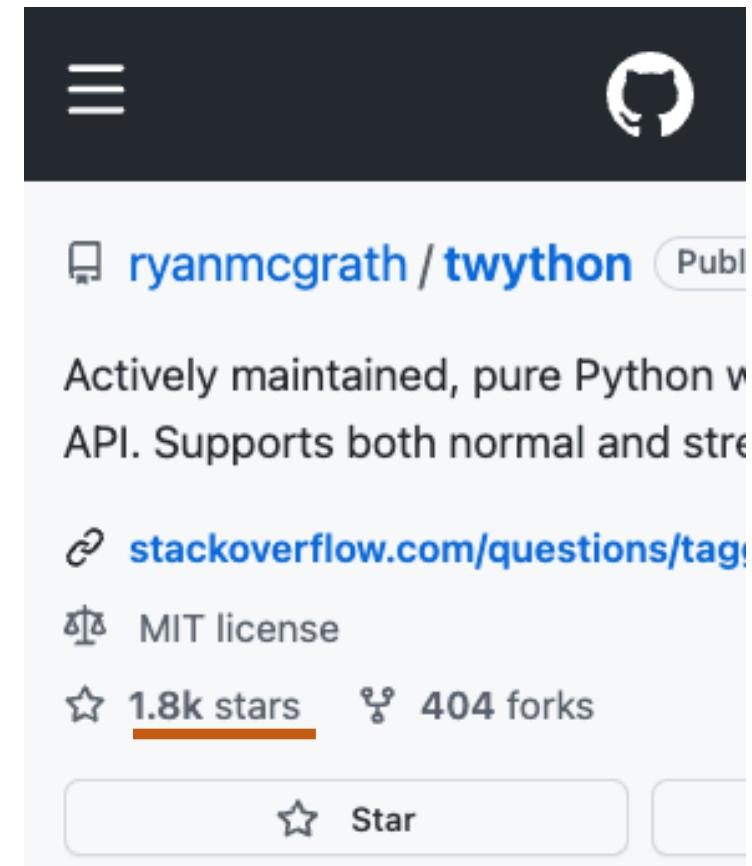
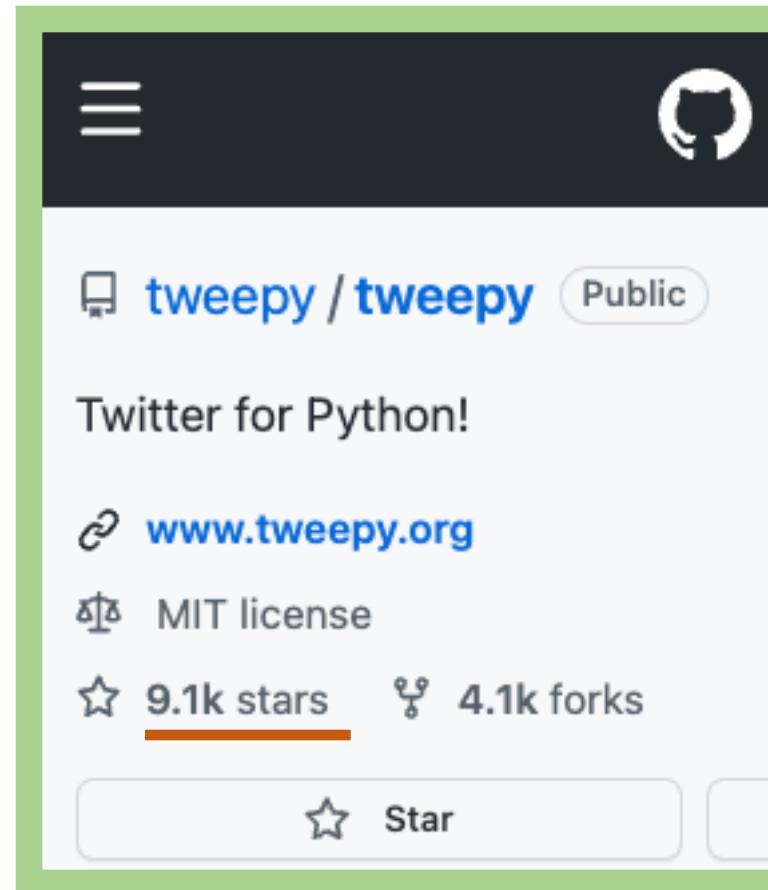
Open Authorization (OAuth) 2.0

For A to access B's authorized info w/o knowing B's password



Twitter Scraping Tools

These packages offer higher-order wrappers of low-level APIs.



Bad News in 2023

Elon Musk decided to make \$\$\$ from API calls

	Free	Basic	Pro
Getting access	Get Started	Get Started	Get Started
Price	Free	\$100/month	\$5000/month
Access to Twitter API v2	✓ (Only Tweet creation)	✓	✓
Access to standard v1.1	✓ (Only Media Upload, Help, Rate Limit, and Login with Twitter)	✓ (Only Media Upload, Help, Rate Limit, and Login with Twitter)	✓ (Only Media Upload, Help, Rate Limit, and Login with Twitter)
Project limits	1 Project	1 Project	1 Project
App limits	1 App per Project	2 Apps per Project	3 Apps per Project
Tweet caps - Post	1,500	3,000	300,000
Tweet caps - Pull	✗	10,000	1,000,000
Filteres stream API	✗	✗	✓
Access to full-archive search	✗	✗	✓
Access to Ads API	✓	✓	✓



Goals for today

Learning APIs of social media

E.g., Reddit & Twitter

Learning APIs for data analytics

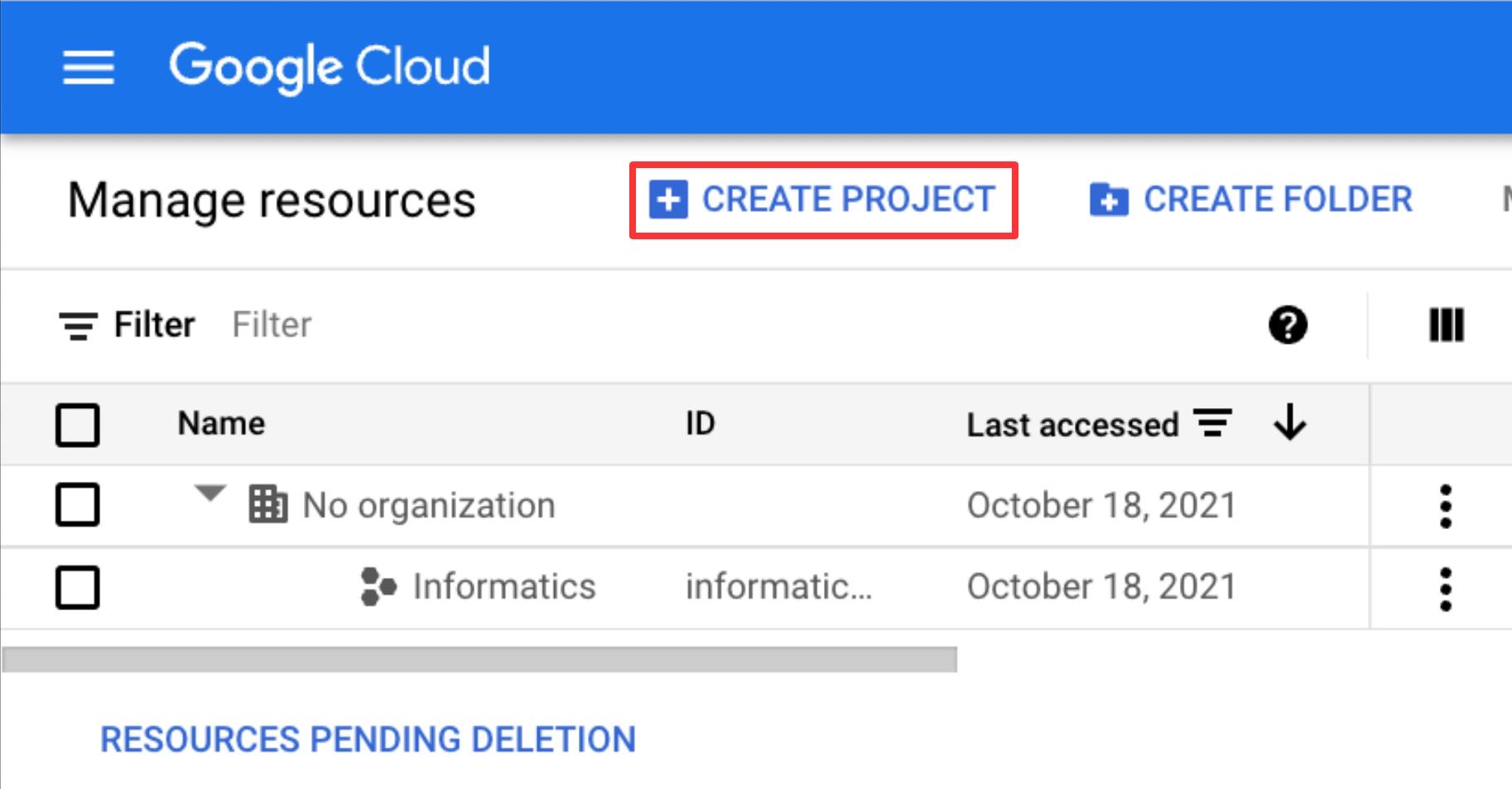
E.g., Google APIs & Azure APIs

Inspired to learn other APIs

E.g., LINE & Telegram

Google Cloud APIs (1/4): Project

Needing to create projects before using Google APIs:



The screenshot shows the Google Cloud console interface. At the top, there's a blue header bar with the "Google Cloud" logo and a menu icon. Below the header, the main navigation bar has "Manage resources" on the left and two buttons on the right: "CREATE PROJECT" and "CREATE FOLDER". The "CREATE PROJECT" button is highlighted with a red rectangular border. The main content area is a table titled "Manage resources" with columns for "Name", "ID", and "Last accessed". There are two rows of data: one for "No organization" (accessed October 18, 2021) and one for "Informatics" (accessed October 18, 2021). At the bottom of the table, there's a grey bar labeled "RESOURCES PENDING DELETION".

Name	ID	Last accessed
No organization		October 18, 2021
Informatics	informatic...	October 18, 2021

RESOURCES PENDING DELETION

Google Cloud APIs (2/4): Keys

Then getting an API Key [here](#):

The screenshot shows the Google Cloud Platform interface. The top navigation bar includes the 'Google Cloud' logo, a dropdown for 'Informatics' (highlighted with a red box), a search icon, a gift icon, a notifications icon (with 1 notification, highlighted with a green circle), a help icon, and a user profile icon.

The main menu on the left has several options: 'Enabled APIs & services', 'Library', 'Credentials' (highlighted with a red box), 'OAuth consent screen', 'Domain verification', and 'Page usage agreements'.

The central area is titled 'APIs & Services' and 'Credentials'. It features a 'CREATE CREDENTIALS' button and a 'DELETE' button. A callout box highlights the 'API key' option under 'API Keys', describing it as 'Identifies your project using a simple API key to check quota and access'.

The 'API Keys' section lists two entries: 'Name' (checkbox) and 'API key 1' (checkbox, highlighted with a purple underline). Below this is a 'Help me choose' section with the description 'Asks a few questions to help you decide which type of credential to use'.

The 'OAuth 2.0 Client ID' section shows a table with columns: Name, Creation date, Type, and Client ID. It lists one entry: 'Other client 1' (checkbox), 'Mar 26, 2017', 'Desktop', and '854992196449-p2tk...' (with a copy icon).

Google Cloud APIs (3/4): Services

Finally enabling a service here:

The screenshot shows the Google Cloud API services page. At the top, there's a navigation bar with the Google Cloud logo, a dropdown menu labeled "Informatics", a search icon, a gift icon, a notifications icon with a "1", a help icon, three dots for more options, and a user profile icon.

The main content area lists various services with their counts:

- Developer stacks (3)
- Networking (8)
- Email (1)
- Storage (8)
- Monitoring (4)
- Mobile (13)
- YouTube (3)
- Google Workspace (19)

Below this list, there's a section titled "YouTube" with a "VIEW ALL (3)" link. Two services are listed: "YouTube Data API v3" and "YouTube Analytics API". The "YouTube Data API v3" card is highlighted with a red border. It features a YouTube logo, the service name, the provider ("Google"), and a brief description: "The YouTube Data API v3 is an API that provides access to YouTube data, such as videos, playlists,...". The "YouTube Analytics API" card also has a YouTube logo, the service name, the provider ("Google"), and a description: "Retrieves your YouTube Analytics data."

Google Cloud APIs (4/4): Go!

☰ YouTube TW

Search

⋮ Sign in

Home

Trending

NOW

MUSIC

GAMING

MOVIES

Subscripti...

Library

History

 iPhone 15 Pro開箱實測！A17 Pro是否效能頂天？【Joeman】
Joeman 881K views • 1 day ago
久等了，廢話就不說了，iPhone 15 Pro開箱實測奉上！每個月100元就可以看頻道專屬影片！
[我的IG : https://reurl.cc/NyXGWe](https://reurl.cc/NyXGWe) 我的IG : <https://goo.gl/2CfTSz> 我的Fb : <https:// goo...>

 iPhone 15 Pro Series Review: The Decisive Moment
钟文泽 568K views • 1 day ago

 【尊】試著挑戰一天全靠骰子生活！？運氣不好,連廁所都上不了...
人生肥宅x尊 286K views • 1 day ago
我的人生就像 上帝:檢定2就可以說服我 (擲骰):1 「我要退款我的人生」 遊戲全靠骰,不管是戰鬥還是劇情都要通過骰子檢定 敢不敢下載來挑戰自己的...

Azure APIs (1/4)

The screenshot shows a web page for Azure Cognitive Services. At the top, there's a navigation bar with links for 'Product overview', 'Features', 'APIs' (which is underlined in blue), and 'More'. Below the navigation, a breadcrumb trail shows 'Home / Products / Cognitive Services'. The main title 'Azure Cognitive Services' is displayed prominently. A large call-to-action button says 'Try Cognitive Services free'. To the right, there are sections for 'Speech', 'Language', 'Vision', 'Decision', 'OpenAI Service', and 'Face API', each with a brief description.

Product overview Features **APIs** More ▾

Home / Products / Cognitive Services

Azure Cognitive Services

Add cognitive capabilities to apps with APIs and AI services.

Try Cognitive Services free

APIs

- Speech
- Language
- Vision
- Decision
- OpenAI Service
- Face API

Identify and analyze content within images and videos.

Computer Vision
Analyze content in images and video.

Custom Vision
Customize image recognition to fit your business needs.

Face API
Detect and identify people in images.

Azure APIs (2/4): Subscription

All services > Cognitive Services

 **Cognitive Services | Computer vision** ⚡ ... ×

Search Create Manage deleted resources ...

Filter for any field...

Subscription equals all Add filter More (3)

No grouping List view

Name ↑↓	Kind ↑↓	Location ↑↓
<input type="checkbox"/>  Class-Demo	ComputerVision	Japan West

Speech

-  Speech service

Language

-  Language service
-  Translator
-  Language understanding (classic)
-  QnA maker (classic)

Vision

-  Computer vision

Azure APIs (3/4): Endpoint & Keys

All services > Cognitive Services | Computer vision > Class-Demo

Class-Demo | Keys and Endpoint

Computer vision

Search Regenerate Key1 Regenerate Key2

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

Keys and Endpoint Pricing tier Networking Identity Cost analysis Properties Locks

KEY 1
bacced188e89468cb06ce91664c43baf

KEY 2
2eec623988bc4efcbbdda30516e77c31

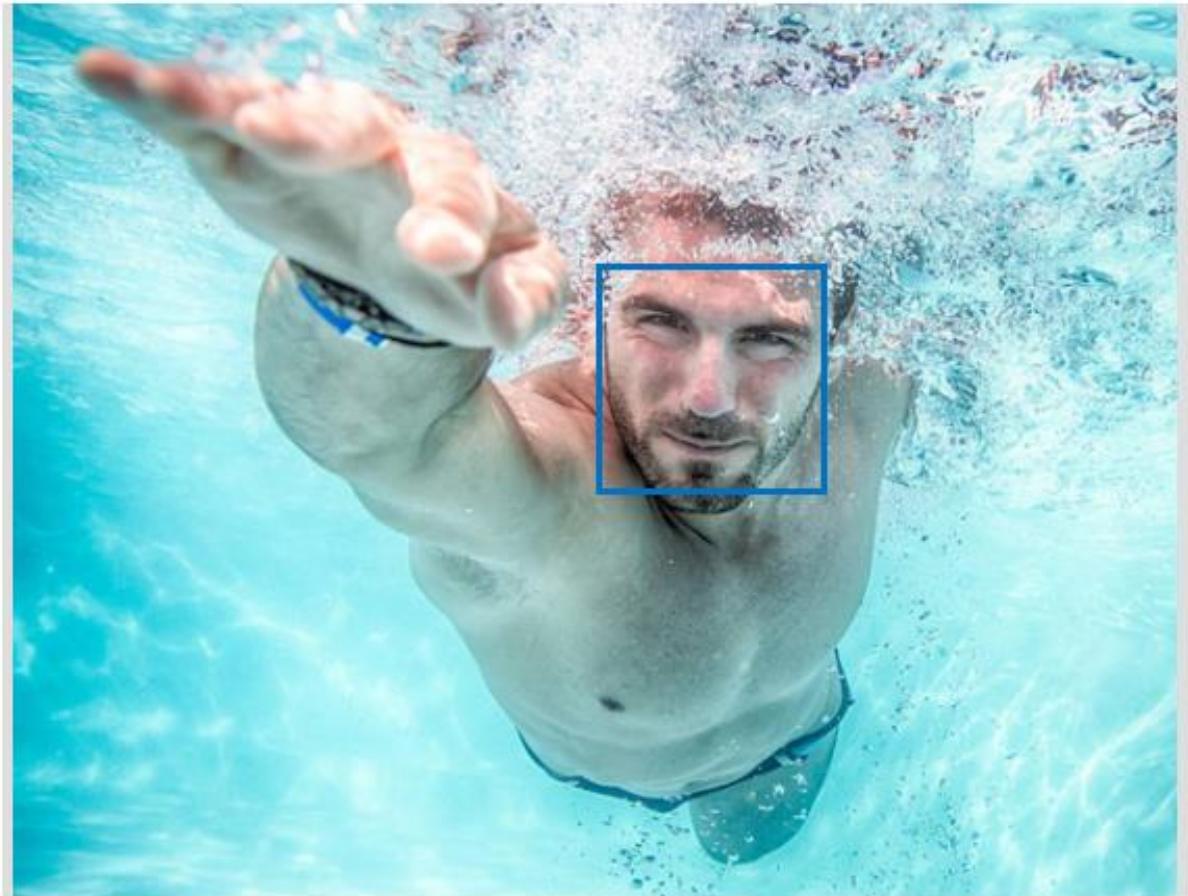
Location/Region
japanwest

Endpoint
<https://class-demo.cognitiveservices.azure.com/>

Hide Keys

Azure APIs (4/4): Go!

You can find more info about Cognitive Services SDK [here](#).



FEATURE	VALUE
NAME:	
Description	{ "tags": ["water", "swimming", "sport", "pool", "person", "man", "frisbee", "ocean", "blue", "bird", "riding", "top", "standing", "wave", "young", "body", "large", "game", "glass", "pond", "playing", "board", "catch", "clear", "boat", "white"], "captions": [{ "text": "a man swimming in a pool of water", "confidence": 0.8909298 }] }
Tags	[{ "name": "water", "confidence": 0.9997857 }, { "name": "swimming", "confidence": 0.955619633 }, { "name": "sport", "confidence": 0.953807831 }, { "name": "pool", "confidence": 0.9515978 }, { "name": "person", "confidence": 0.889862537 }, { "name": "water sport", "confidence": 0.664259 }]
Image format	"Jpeg"

Goals for today

Learning APIs of social media

E.g., Reddit & Twitter

Learning APIs for data analytics

E.g., Google APIs & Azure APIs

Inspired to learn other APIs

E.g., LINE & Telegram



More APIs: Toward Experiments



- LINE
- Telegram
- ChatGPT
-

Game Over

