



Scottish Graduate School
of Social Science
Sgoil Cheumnaichean Saidheans
Sòisealta na h-Alba

Collecting Digital Data

What Are APIs and Why Use Them?

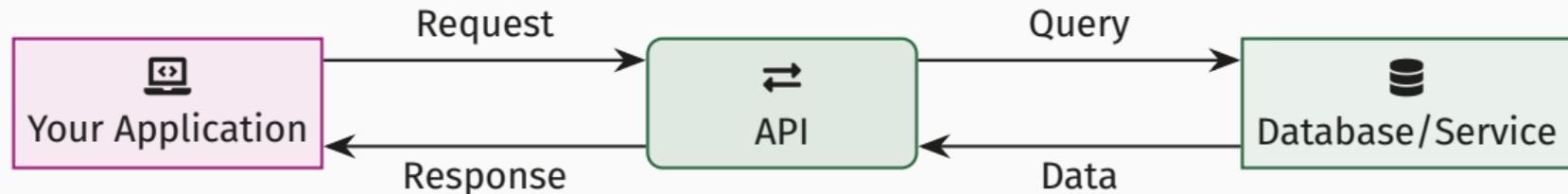
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24 February 2026

What Are APIs and Why Use Them?

What is an API?



API = Application Programming Interface

Think of it as a **translator**: your application doesn't need to know *how* the database is organised – it just asks the API in a standard way, and the API returns structured data.

APIs vs Web Scraping

	Web Scraping	APIs
Data format	Unstructured HTML	Structured JSON/XML
Reliability	Breaks when site changes	Versioned, documented
Legality	Grey area	Usually explicit ToS
Rate limits	You must self-impose	Enforced by provider
Authentication	Usually none	Often API key

If an API exists, use it. Web scraping is a last resort.

Anatomy of an API Call

~~https://data.police.uk/api/stops-force?force=city-of-london&date=2024-01~~

Base URL

Endpoint

Query parameters

key=value pairs joined by &

Headers

Accept: application/json

Authentication

API key, OAuth token, or none

The UK Police API is **open** — no authentication needed. Many other APIs require an API key sent as a header or query parameter.

Reading API Documentation

What to look for when you open the docs:

- ✓ **Endpoints** — what URLs are available and what data do they return?
- ✓ **Authentication method** — API key, OAuth, or open access?
- ✓ **Rate limits** — how many requests per minute/day?
- ✓ **Response format** — JSON, XML, CSV?
- ✓ **Example requests & responses** — try them in a browser first!

UK Police API — data.police.uk/docs/

- ✓ Open access (no key needed)
- ✓ Returns JSON
- ✓ Rate limit: 15 requests per second
- ✓ Endpoints: stop-and-search, crimes, neighbourhoods, forces

JSON Deep-Dive

Structure

```
{  
  "type": "Person"  
  "age_range": "18-24"  
  "legislation": [  
    {"name": "PACE (1984)"}  
  ]  
}
```

— Keys — Values

As code

```
{  
  "type": "Person",  
  "age_range": "18-24",  
  "legislation": [  
    {  
      "name": "PACE (1984)"  
    }  
  ],  
  "outcome": true  
}
```

JSON types:

- **Object** {} – key-value pairs
- **Array** [] – ordered list
- **String, Number, Boolean, null**

Practical 2: UK Police API

- Make your first API request (in a browser, then in code)
- Parse JSON responses into tabular data
- Explore stop-and-search data for a chosen police force
- Handle pagination and query parameters

Open the **Practical 2** notebook in Google Colab
(Python or R – your choice!)