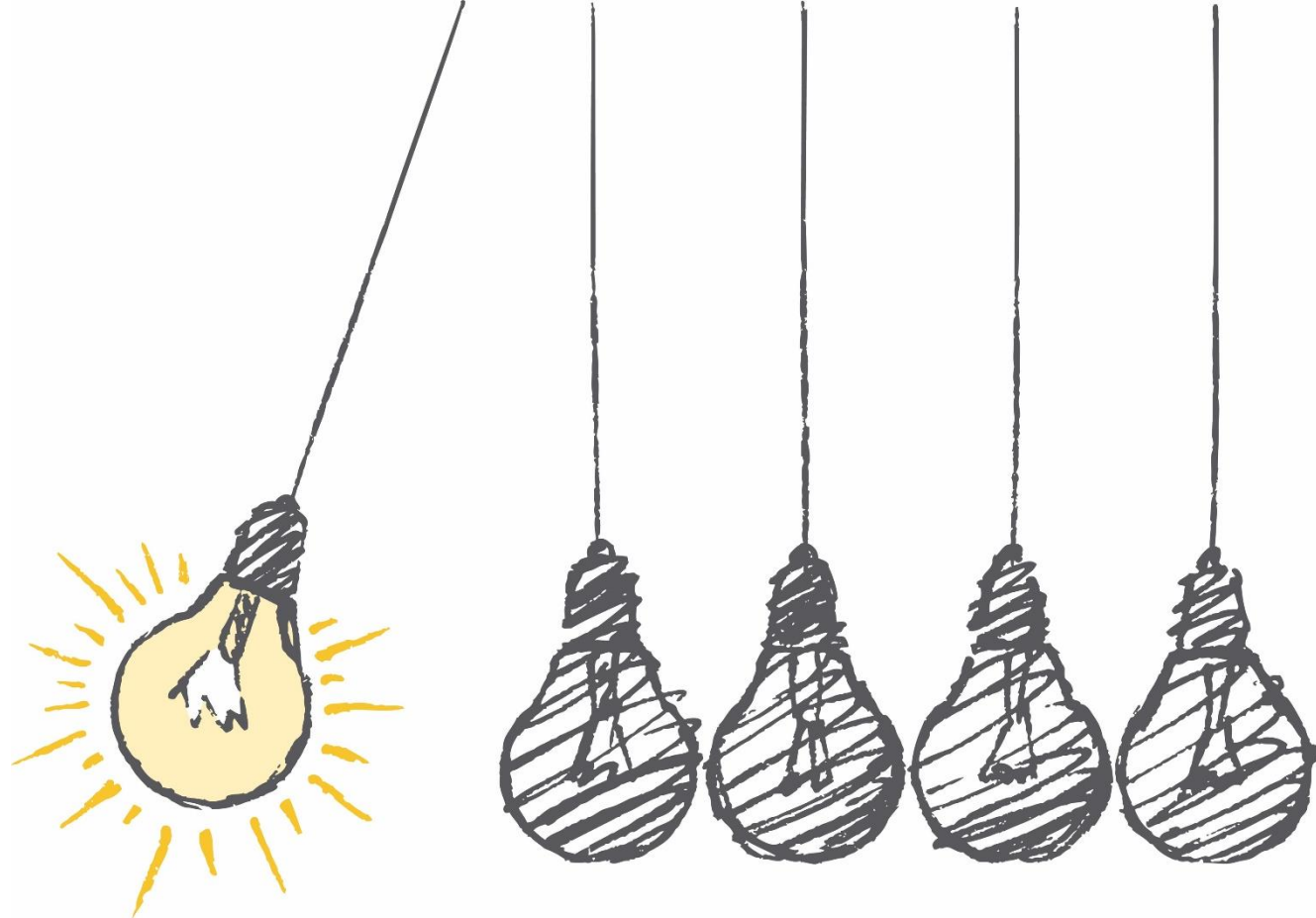


Session 4 - Introduction to APIs

Python for Data Science

The World Bank | [Course GitHub repository](#)



THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP
Development Economics • Data

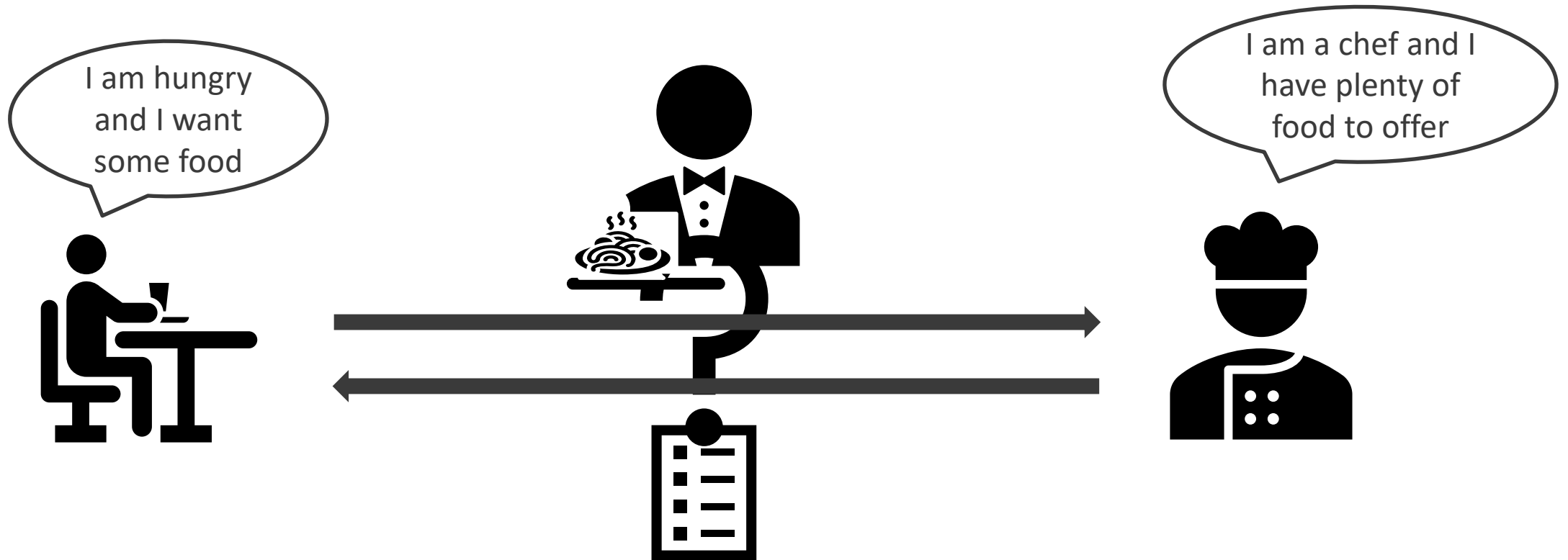


Norad

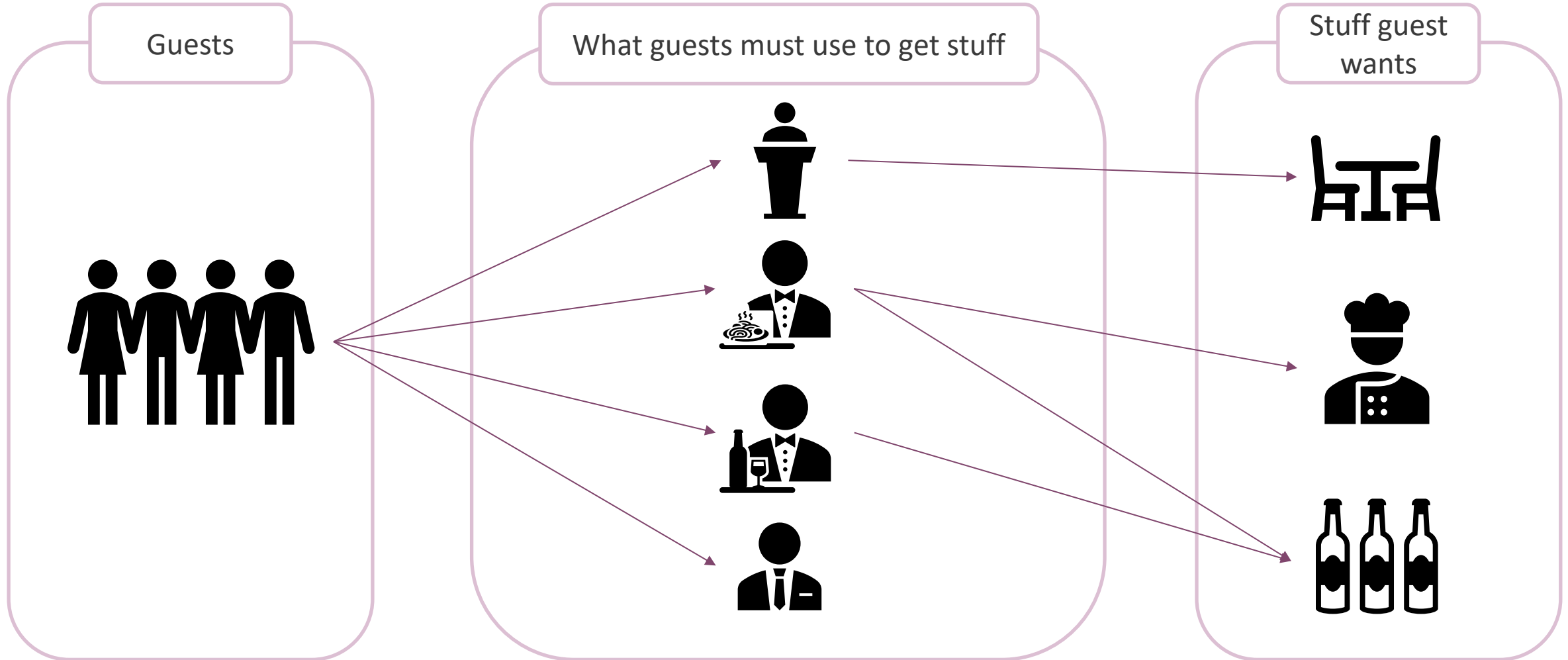
What is an API?
(Application Programming
Interface)



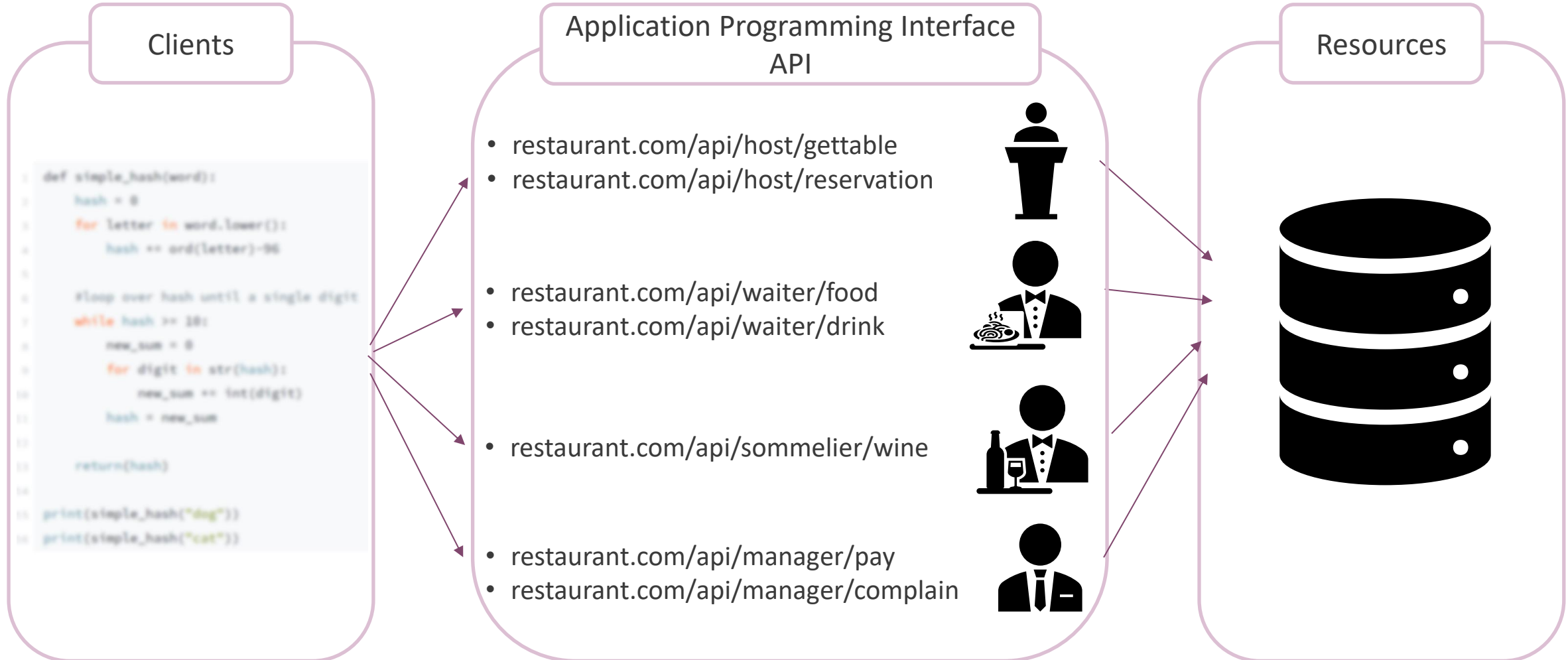
restaurant.com



restaurant.com



restaurant.com



Application Programming Interfaces (APIs)

- An API is a channel to interact with a web server
- In data science, these interactions are often used to retrieve data from data bases

Application Programming Interfaces (APIs)

- Why an API?
 - Allows to access data programmatically
 - No more sharing data and code for a project, only code
 - Allows to run code on the most recent data available or to update data seamlessly

Application Programming Interfaces (APIs)

- How to use an API
 1. Read the API documentation
 2. Find the API endpoint
 3. Explore the endpoint
 - Start by trying a simple query in your web browser
 4. Explore the API result
 - JSON is a widely used data format. It consists of nested dictionaries and lists
 5. Write code to send custom API requests

API Example 1: <http://open-notify.org/>

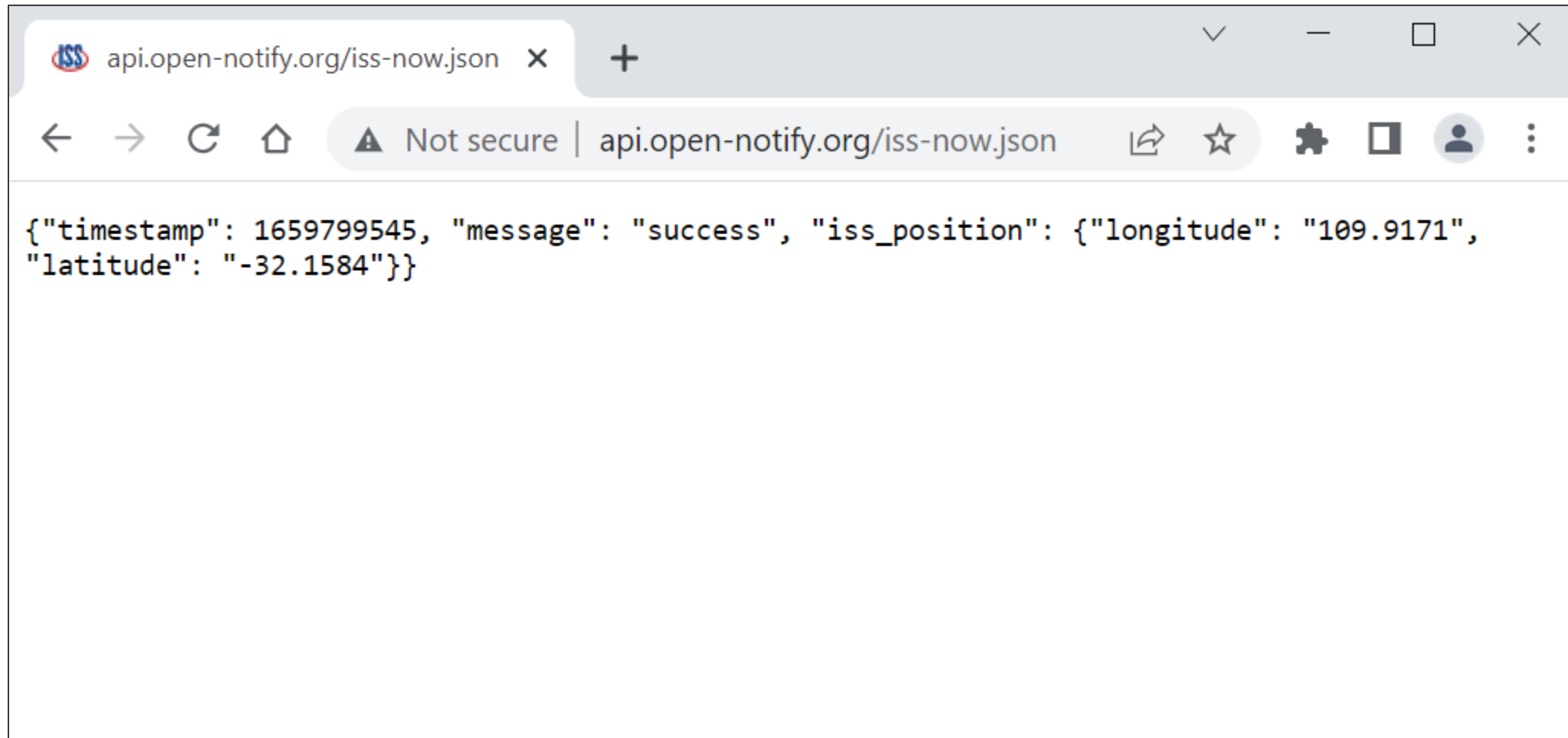
A very simple API to get real time data about the International Space Station

You can find the documentation here: <http://open-notify.org>

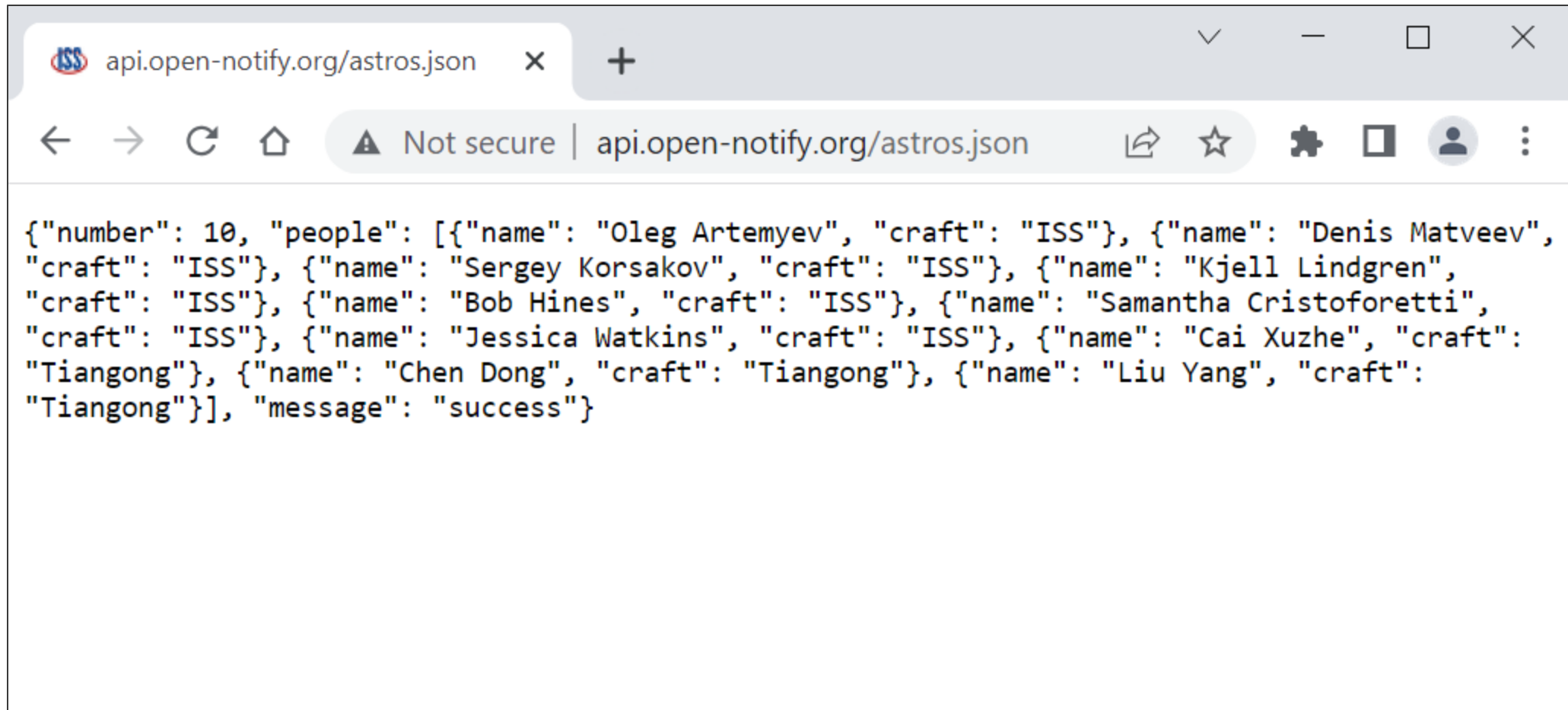
Two endpoints:

- Current location of the ISS: <http://api.open-notify.org/iss-now.json>
- Astronauts in space now: <http://api.open-notify.org/astros.json>

API Example 1: <http://open-notify.org/>



API Example 1: <http://open-notify.org/>

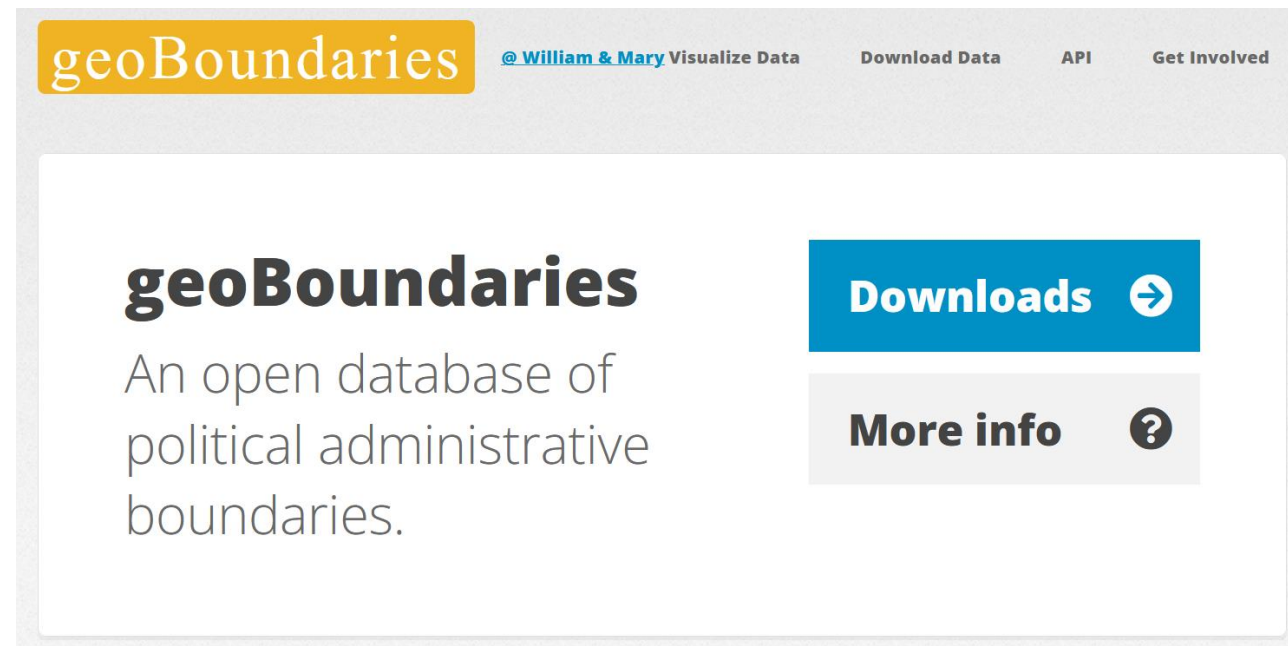


```
{
  "number": 10,
  "people": [
    {
      "name": "Oleg Artemyev",
      "craft": "ISS"
    },
    {
      "name": "Denis Matveev",
      "craft": "ISS"
    },
    {
      "name": "Sergey Korsakov",
      "craft": "ISS"
    },
    {
      "name": "Kjell Lindgren",
      "craft": "ISS"
    },
    {
      "name": "Bob Hines",
      "craft": "ISS"
    },
    {
      "name": "Samantha Cristoforetti",
      "craft": "ISS"
    },
    {
      "name": "Jessica Watkins",
      "craft": "ISS"
    },
    {
      "name": "Cai Xuzhe",
      "craft": "Tiangong"
    },
    {
      "name": "Chen Dong",
      "craft": "Tiangong"
    },
    {
      "name": "Liu Yang",
      "craft": "Tiangong"
    }
  ],
  "message": "success"
}
```

API Example 2: <https://www.geoboundaries.org/>

API to fetch geographic country data.

Documentation: <https://www.geoboundaries.org/api.html>



API Example 2: <https://www.geoboundaries.org/>

From the documentation:

API Access to geoBoundaries

Information on every geoBoundary, including paths for geoJSONs, shapefiles, years of validity and more, can be retrieved through any http-compliant query; a JSON object is returned. We provide one endpoint for users:

```
https://www.geoboundaries.org/api/current/[RELEASE-TYPE]/[3-LETTER-ISO-CODE]/[BOUNDARY-TYPE]/
```

Custom API calls

Most APIs require users to pass information through the URL to specify how they want to interact with the web server.

Examples:

API Access to geoBoundaries

Information on every geoBoundary, including paths for geoJSONs, shapefiles, years of validity and more, can be retrieved through any http-compliant query; a JSON object is returned. We provide one endpoint for users:

```
https://www.geoboundaries.org/api/current/[RELEASE-TYPE]/[3-LETTER-ISO-CODE]/[BOUNDARY-TYPE]/
```

Custom API calls

API Access to geoBoundaries

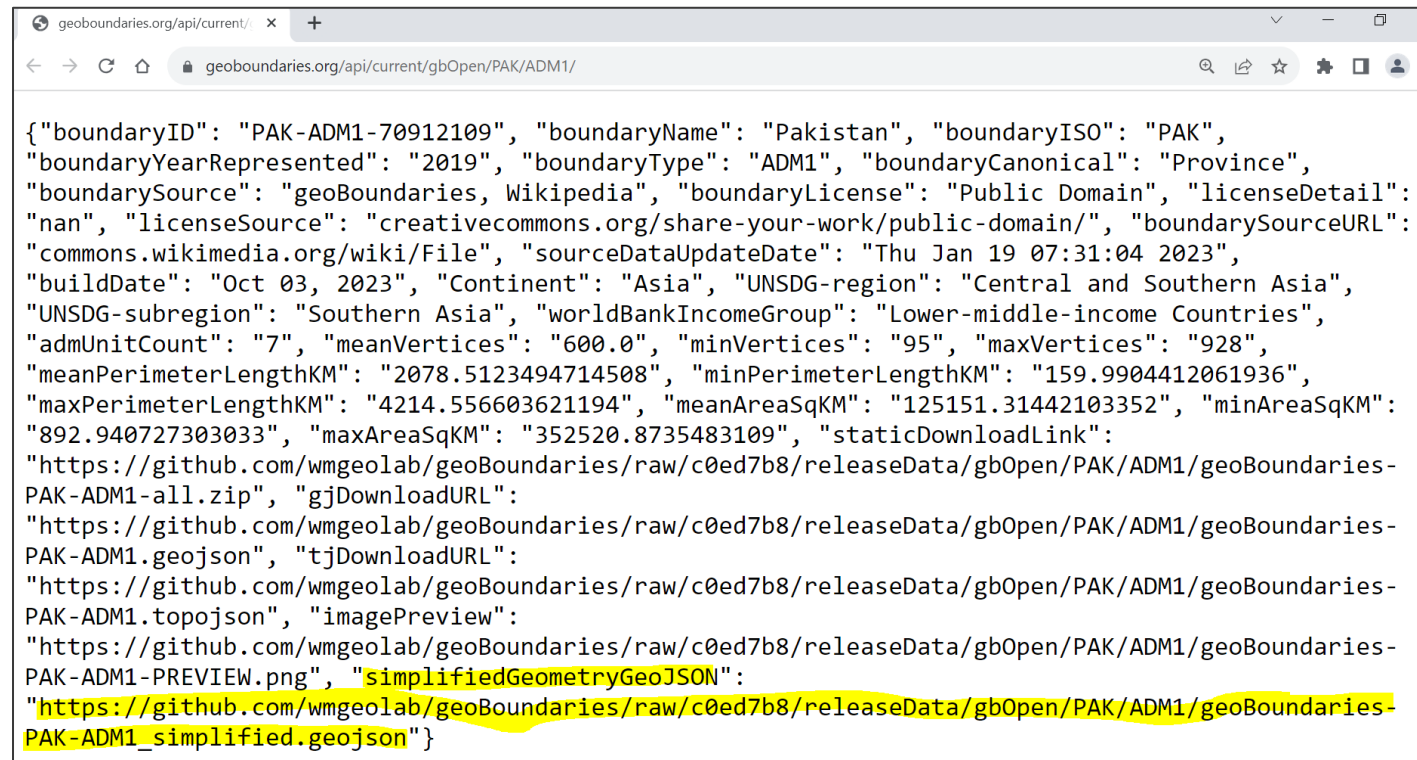
Information on every geoBoundary, including paths for geoJSONs, shapefiles, years of validity and more, can be retrieved through any http-compliant query; a JSON object is returned. We provide one endpoint for users:

```
https://www.geoboundaries.org/api/current/[RELEASE-TYPE]/[3-LETTER-ISO-CODE]/[BOUNDARY-TYPE]/
```

- Colombia national boundaries:
<https://www.geoboundaries.org/api/current/gbOpen/COL/ADM0/>
- Pakistan first-level administrative boundaries:
<https://www.geoboundaries.org/api/current/gbOpen/PAK/ADM1/>

Exploring API results

- Many APIs will return extra information and metadata we don't always need
- You should explore the returning JSON to locate relevant information and data



```
{
  "boundaryID": "PAK-ADM1-70912109",
  "boundaryName": "Pakistan",
  "boundaryISO": "PAK",
  "boundaryYearRepresented": "2019",
  "boundaryType": "ADM1",
  "boundaryCanonical": "Province",
  "boundarySource": "geoBoundaries, Wikipedia",
  "boundaryLicense": "Public Domain",
  "licenseDetail": "nan",
  "licenseSource": "creativecommons.org/share-your-work/public-domain/",
  "boundarySourceURL": "commons.wikimedia.org/wiki/File:",
  "sourceDataUpdateDate": "Thu Jan 19 07:31:04 2023",
  "buildDate": "Oct 03, 2023",
  "Continent": "Asia",
  "UNSDG-region": "Central and Southern Asia",
  "UNSDG-subregion": "Southern Asia",
  "worldBankIncomeGroup": "Lower-middle-income Countries",
  "admUnitCount": "7",
  "meanVertices": "600.0",
  "minVertices": "95",
  "maxVertices": "928",
  "meanPerimeterLengthKM": "2078.5123494714508",
  "minPerimeterLengthKM": "159.9904412061936",
  "maxPerimeterLengthKM": "4214.556603621194",
  "meanAreaSqKM": "125151.31442103352",
  "minAreaSqKM": "892.940727303033",
  "maxAreaSqKM": "352520.8735483109",
  "staticDownloadLink": "https://github.com/wmgeolab/geoBoundaries/raw/c0ed7b8/releaseData/gbOpen/PAK/ADM1/geoBoundaries-PAK-ADM1-all.zip",
  "gjDownloadURL": "https://github.com/wmgeolab/geoBoundaries/raw/c0ed7b8/releaseData/gbOpen/PAK/ADM1/geoBoundaries-PAK-ADM1.geojson",
  "tjDownloadURL": "https://github.com/wmgeolab/geoBoundaries/raw/c0ed7b8/releaseData/gbOpen/PAK/ADM1/geoBoundaries-PAK-ADM1.topojson",
  "imagePreview": "https://github.com/wmgeolab/geoBoundaries/raw/c0ed7b8/releaseData/gbOpen/PAK/ADM1/geoBoundaries-PAK-ADM1-PREVIEW.png",
  "simplifiedGeometryGeoJSON": "https://github.com/wmgeolab/geoBoundaries/raw/c0ed7b8/releaseData/gbOpen/PAK/ADM1/geoBoundaries-PAK-ADM1_simplified.geojson"
}
```


Now we'll continue
with the notebooks
for this session

Thank you!
Gracias!

