

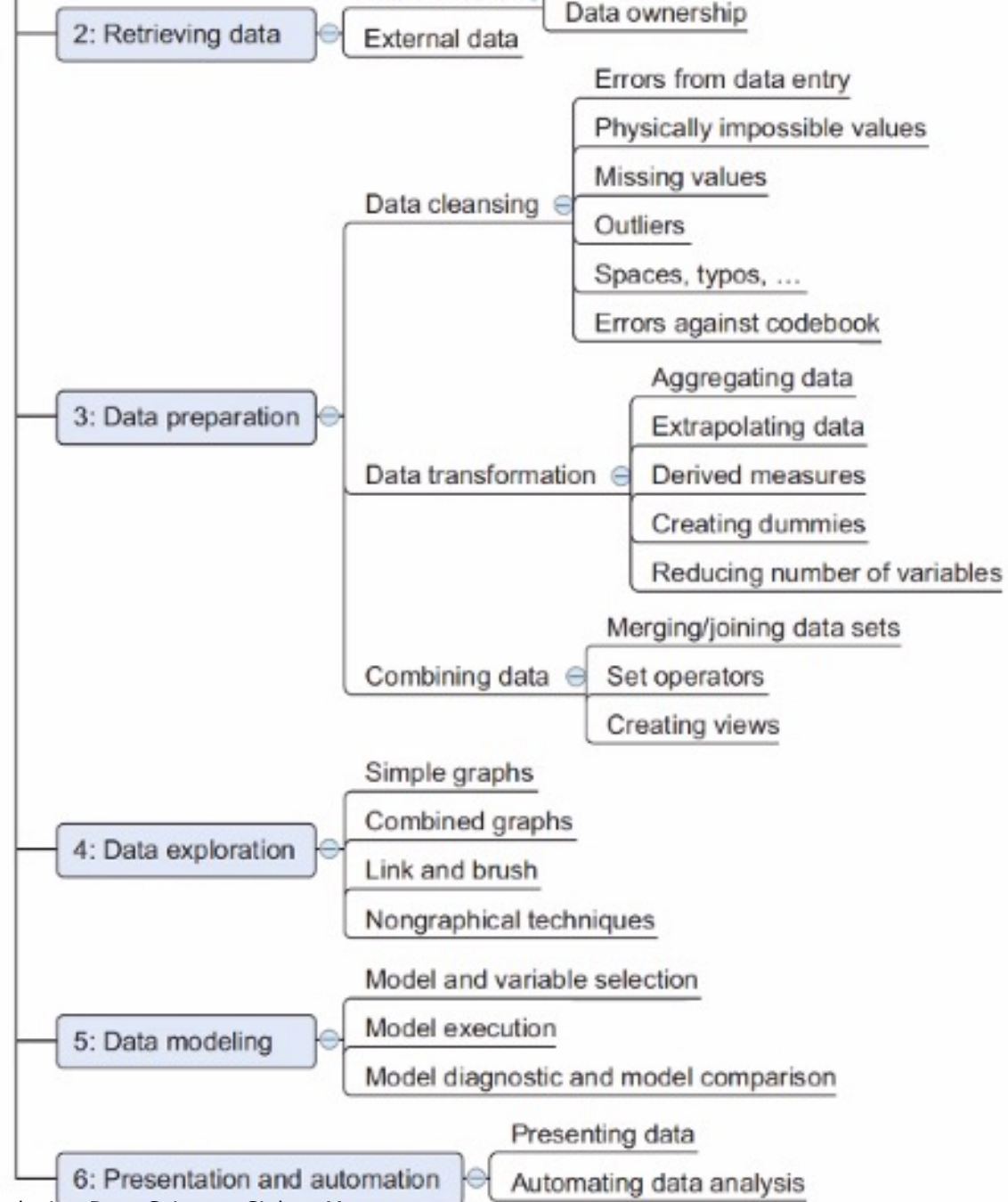
Data science trin de

Som st

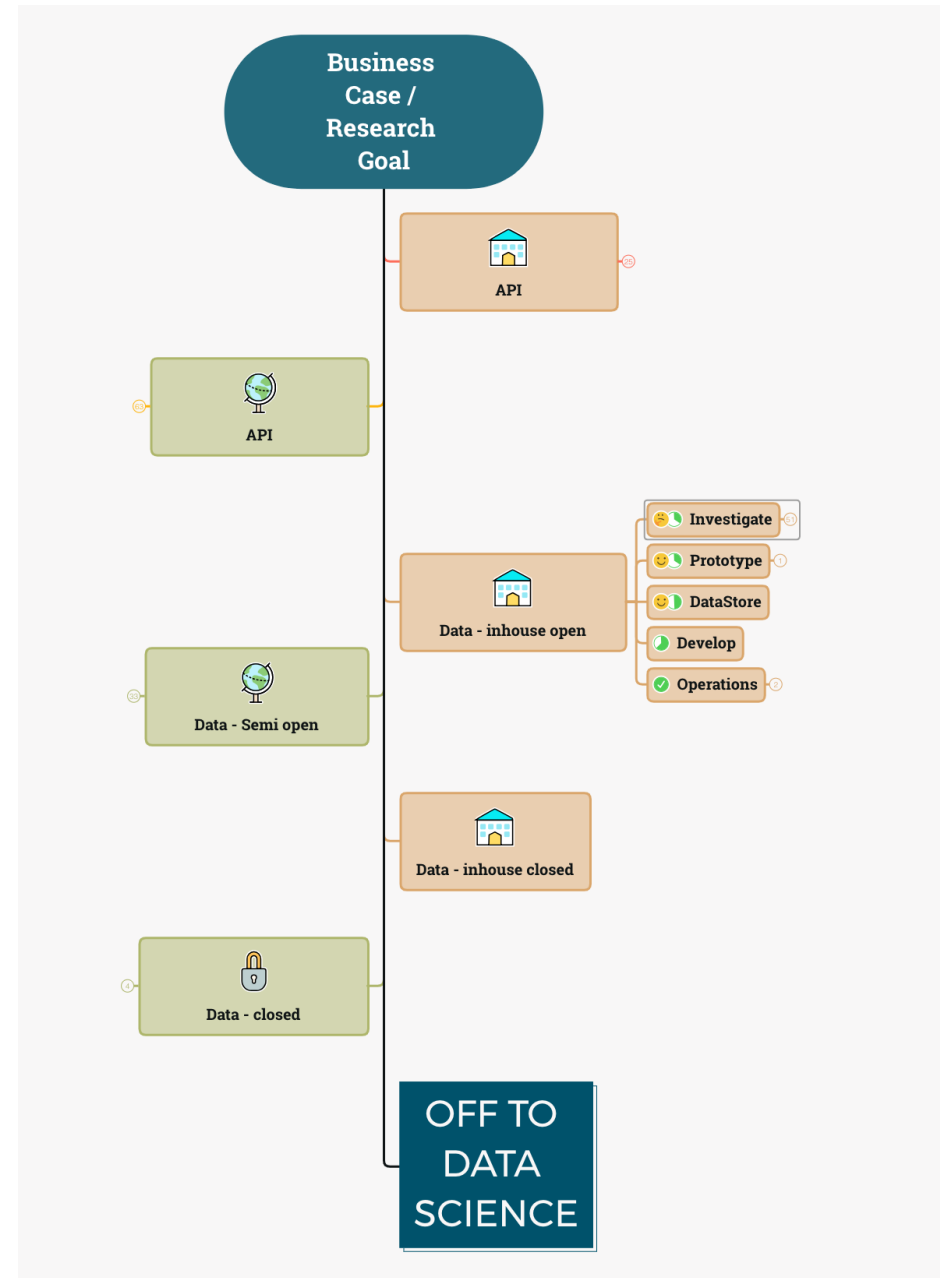
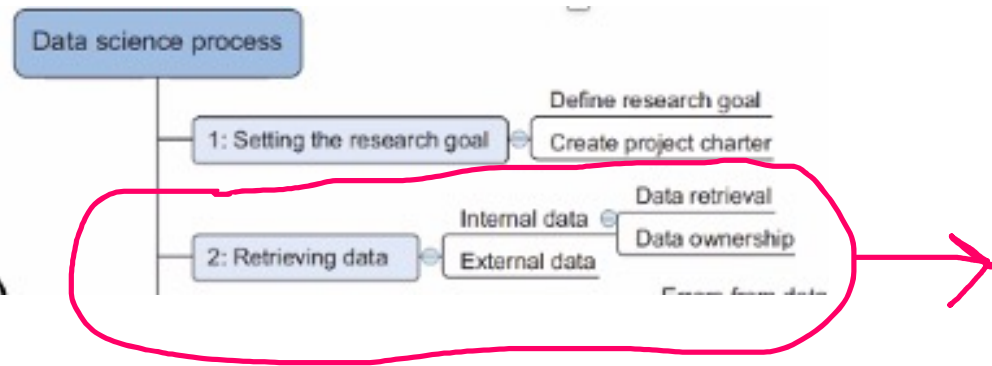
- Få øv
plane
- Kom
enke
- Itere
forsk
komp

Planer

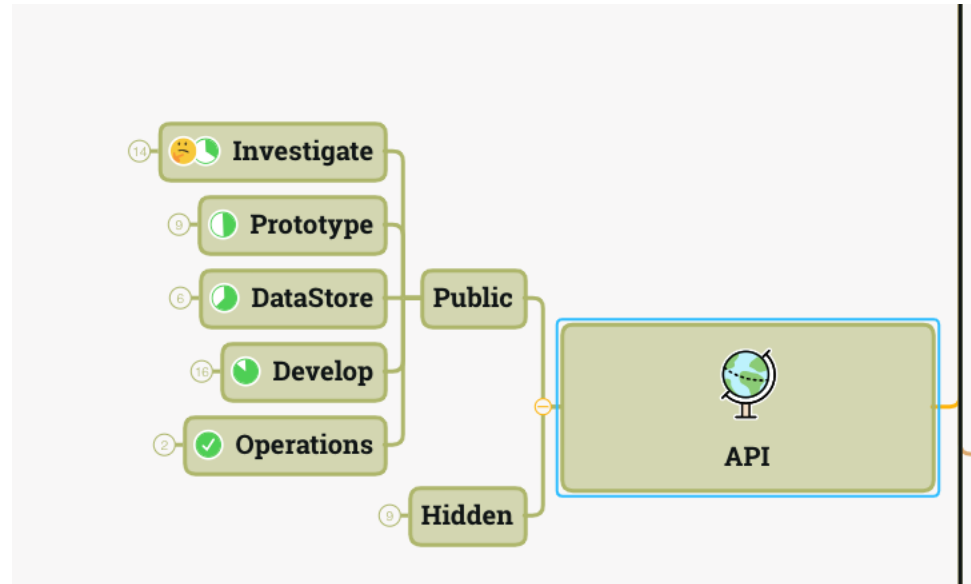
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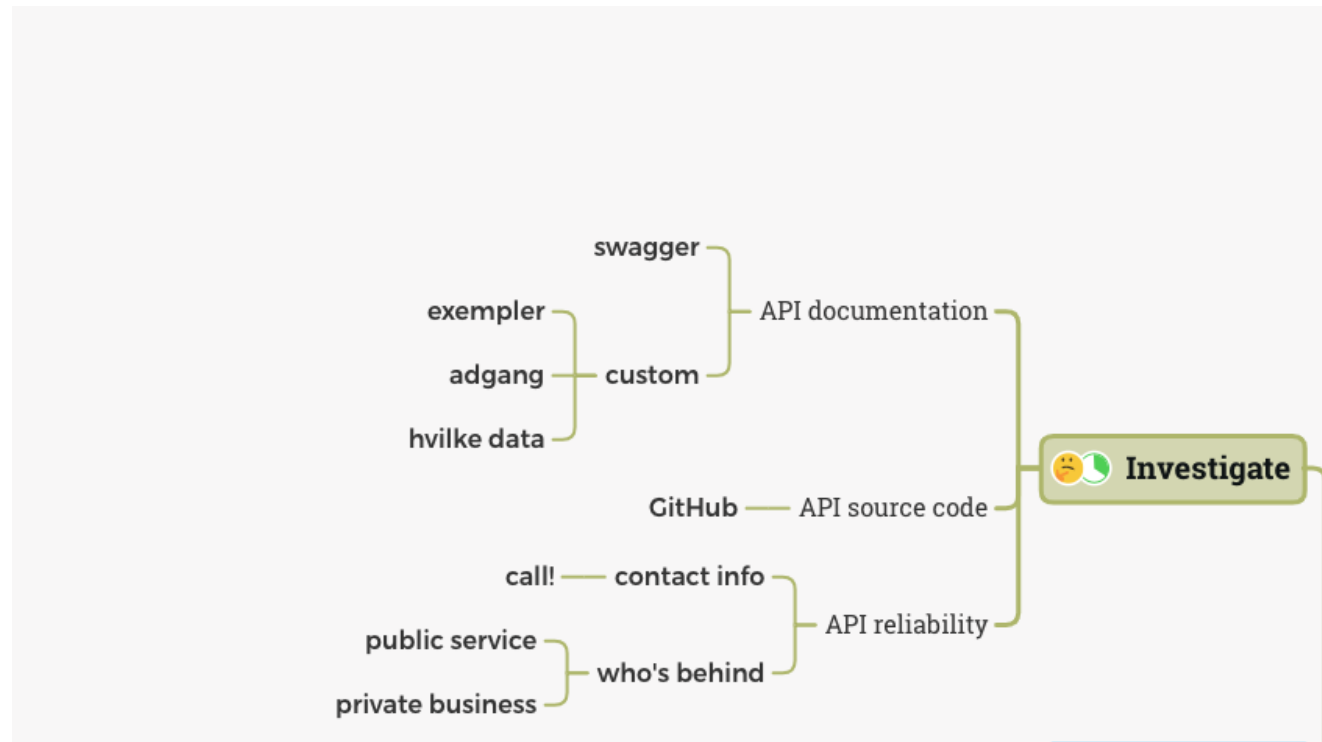
Data-retrieval



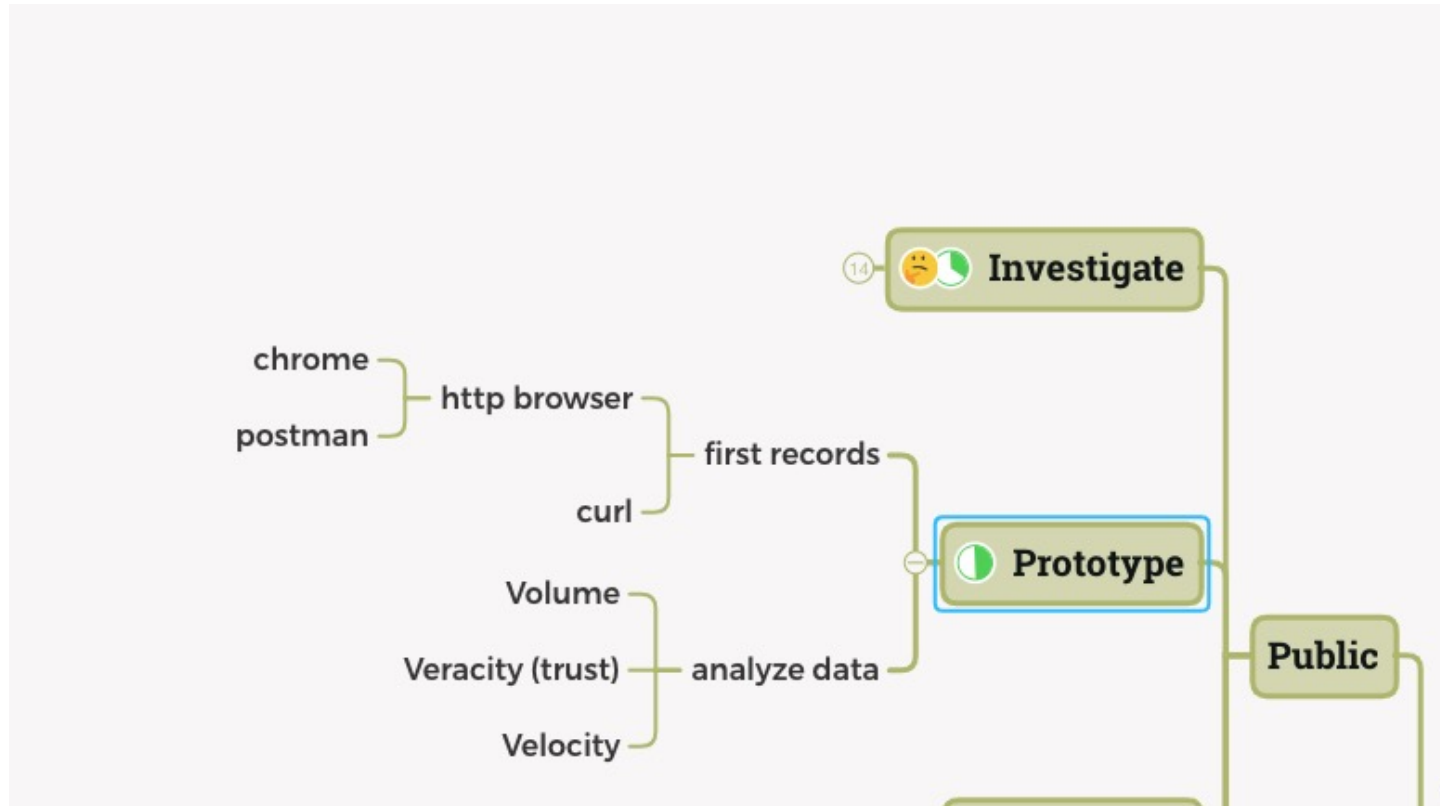
Data-retrieval: Public API



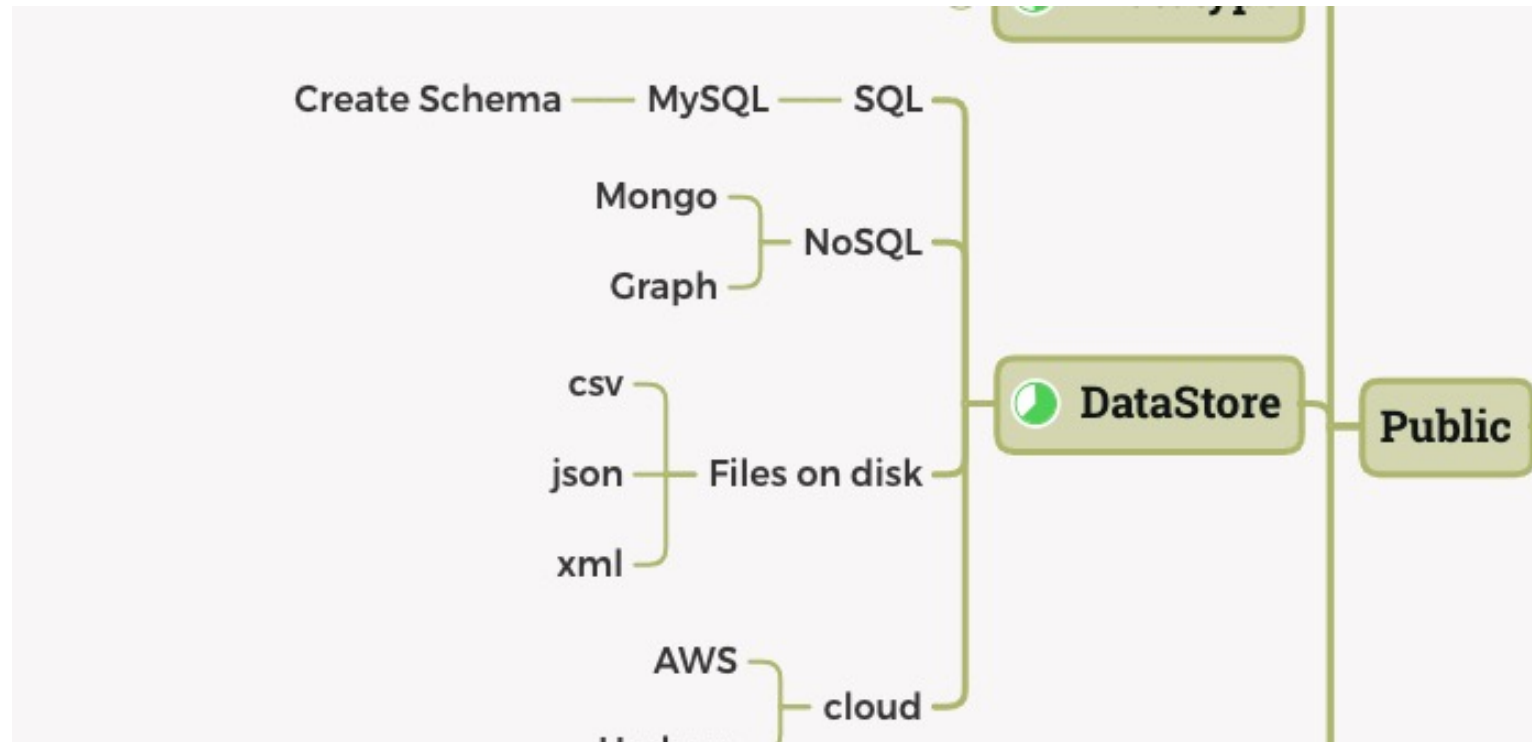
Data-retrieval: Public API -> Investigate



Data-retrieval: Public API -> Prototype



Data-retrieval: Public API -> Datastore

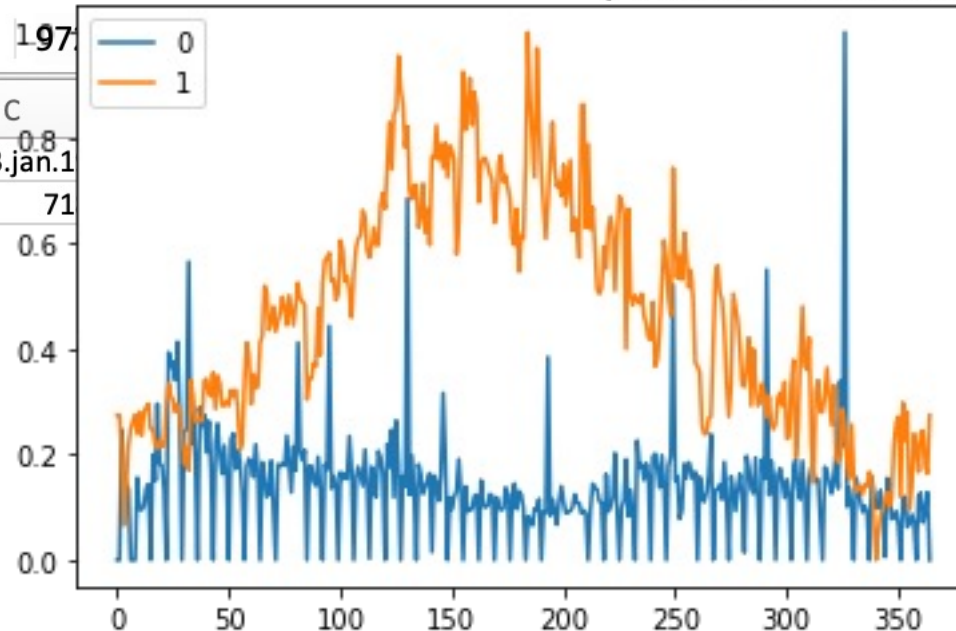


Data-retrieval CASE: DMI public API & SMK



B2 fx 197

	A	B	C
1	01.jan.19	02.jan.19	03.jan.19
2	0	972	71



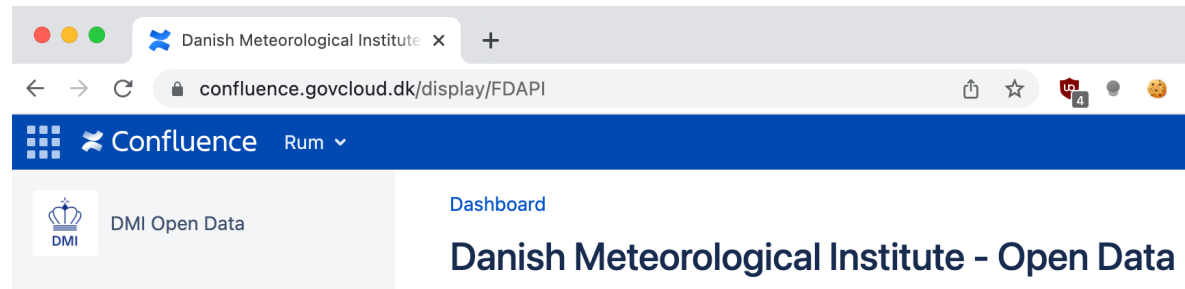
DMI Open Data Developers portal

```
{
  "observed": "2019-12-30T18:00:00Z",
  "value": 7.4
}
{
  "observed": "2019-12-29T18:00:00Z",
  "value": 4.6
}
{
  "observed": "2019-12-28T18:00:00Z",
  "value": 0.4
}
{
  "observed": "2019-12-27T18:00:00Z",
  "value": 2.7
}
{
  "observed": "2019-12-26T18:00:00Z",
  "value": 5.4
}
{
  "observed": "2019-12-25T18:00:00Z",
  "value": 6.5
}
{
  "observed": "2019-12-24T18:00:00Z",
  "value": 7
}
{
  "observed": "2019-12-23T18:00:00Z",
  "value": 7.4
}
{
  "observed": "2019-12-22T18:00:00Z",
  "value": 6.2
}
{
  "observed": "2019-12-21T18:00:00Z",
  "value": 7.6
}
```

Data-retrieval CASE: Investigate

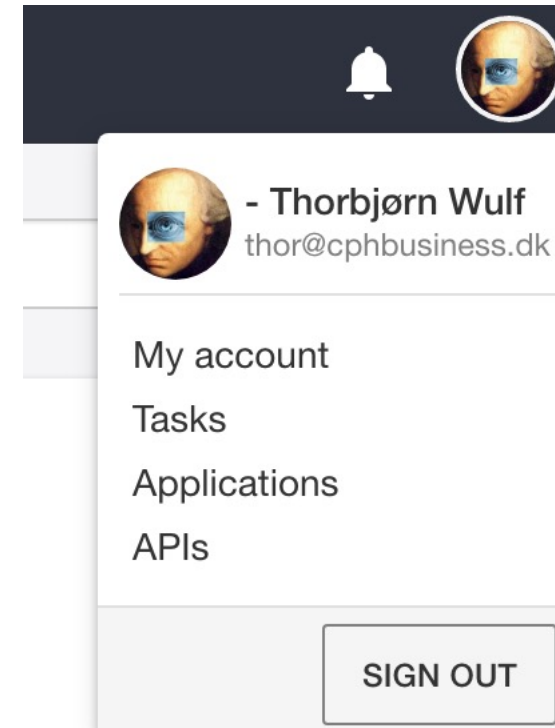


DMI Open Data Developers portal





Before you start consuming data from the API, we ask you to:

1. **Register as a user** in DMI's Developer Portal
2. **Register an application** in the Developer Portal and get your "API Key"
3. **Save the API key** somewhere safe, because you need it every time you make a request for the API. Otherwise you will not be authorized by the API.



Data-retrieval CASE: Investigate

DMI Open Data Developers portal

- Thorbjørn Wulf
thor@cphbusiness.dk

My account

Tasks

Applications

APIs

SIGN OUT

1 General
2 Security
3 Subscription
4 Validation

Name *
SMK DMI

Application name
7 / 512

Description *
weather - visitor correlation?

Provide a description to your application, what it does, ...

CANCEL
NEXT

SMK DMI (SIMPLE) [SUBSCRIBE TO APIS](#)

weather - visitor correlation?

- Thorbjørn Wulf
2 minutter siden

[Back to subscriptions](#)

Subscription

ID	54d70e41-c54d-4cba-970e-41c54d7cba0b	Created at	Aug 11, 2022 11:36:22.518 AM
API	metObsAPI	Processed at	Aug 11, 2022 11:36:22.710 AM
Plan	metObsV2 (api_key)	Starting at	Aug 11, 2022 11:36:22.707 AM
Status	ACCEPTED	Ending at	-
Subscribed by	- Thorbjørn Wulf		

CLOSE

Api Keys



Key	Created at	Revoked / Expire at
✓ f76cb11d-5c0f-494f-abfe-2cbfda38eed5	2022-08-11 11:36:22	


Before you start consuming data from the API, we ask you to:

1. **Register as a user** in DMI's Developer Portal
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Data-retrieval CASE: Investi gate

DMI Open Data Developers portal



- Thorbjørn Wulf
thor@cphbusiness.dk

My account

Tasks

Applications

APIs

SIGN OUT

Subscriptions

Status						
Apis	▼	Accepted, Paused, Pending	▼	API key	SEARCH	CLEAR
API	Plan	Created at	Processed at	Start at	End at	Status
metObsAPI	metObsV2	2022-08-11 11:36:22	2022-08-11 11:36:22	2022-08-11 11:36:22	-	Accepted
		1 ▼	10 ▼	1 - 1 of 1	< >	

Data-retrieval CASE: Investigate



DMI Open Data Developers portal

climateDataAPI

2.0

API and bulk download services for climate data



forecastdataAPI

1.0

API for forecast data



lightningDataAPI

2.0

API and bulk download services for lightning data from DMI's network of lightning sensors in Denmark.



metObsAPI

2.0

API and bulk download services for meteorological observations from DMI owned stations located in Denmark and Greenland.



oceanObsAPI

2.0

API service for oceanographic observation



Select an API Plan

The API plan is corresponding to the service contract between you and the API.

metObsV2



Select an application

Application is the link between you, the consumer, and the subscription to an API plan.

SMK DMI



Send a comment to the API Owner

0 / 150

SUBSCRIBE



metObsAPI

Version: 2.0
Owner: - Admin
Published: Dec

Overview

Documentation

METOBsv2

Meteorological observation API and bulk download with api-key

SUBSCRIBE

OPENAPI

OpenAPI documentation (no subscription needed)

SUBSCRIBE

Data-retrieval CASE: Investigate



DMI Open Data Developers portal

climateDataAPI

2.0

API and bulk download services for climate data



forecastdataAPI

1.0

API for forecast data



lightningDataAPI

2.0

API and bulk download services for lightning data from DMI's network of lightning sensors in Denmark.



metObsAPI

2.0

API and bulk download services for meteorological observations from DMI owned stations located in Denmark and Greenland.



Let's start to use "metObsAPI" with "SMK DMI"!



You can access the API using the following API Key:: `f76cb11d-5c0f-494f-abfe-2cbfda38eed5`



Request sample using curl:


```
curl -X GET "https://dmigw.govcloud.dk/v2/metObs" -
H "X-Gravitee-Api-Key: f76cb11d-5c0f-494f-abfe-2cbfda38eed5"
```




Data-retrieval CASE: Investigate



DMI Open Data Developers portal


Confluence
Rum


DMI Open Data

SIDETRÆ

- Getting Started
- User Creation
- Meteorological Observation
 - Service Documentation (metObs)
 - OpenAPI Specification (metObs)
 - Schema (metObs)
 - Request & Response Examples (metObs)**
 - Bulk Download Service (metObs)
 - Release Notes (metObs)
 - Data Information (metObs)
- Oceanographic Observation
- Lightning data
- Climate data
- Radar Data
- Forecast Data

Schema (metObs)

Oprettet af DMI Bruger, senest ændret d. feb. 03, 2022

Table of contents:

- Overall Structure
- FeatureCollection
- Generic fields for every Feature Object
- Observation
- Station

Service Documentation (metObs)

- OpenAPI Specification (metObs)
- Schema (metObs)
- Request & Response Examples (metObs)
- Bulk Download Service (metObs)
- Release Notes (metObs)

Data Information (metObs)

- About Meteorological
- Codes (metObs)
- Parameters (metObs)
- Stations (metObs)

stationId	Narrow the search to a specific station ID	stationId=SOME_ID	Example: https://dmigw.govcloud.dk/v2/metObs/collections/02-12T00:00:00Z/2018-03-18T00:00:00Z Description: Returns observations for the station with the id
datetime	Narrow the search to a date range or a specific date. The range can	datetime=START_DATE/END_DATE datetime=../END_DATE datetime=START_DATE/.. datetime=DATE	Example: https://dmigw.govcloud.dk/v2/metObs/collections/02-12T00:00:00Z/2018-03-18T00:00:00Z Description: Returns observations within the dates UTC 2003-18 at midnight. Both dates are inclusive.

Data-retrieval CASE: Investigate



DMI Open Data Developers portal



DMI Open Data

SIDETRÆ

- Getting Started
- User Creation
- ▼ Meteorological Observation
 - ▼ Service Documentation (metObs)
 - OpenAPI Specification (metObs)
 - Schema (metObs)
 - **Request & Response Example**
 - Bulk Download Service (metObs)
 - Release Notes (metObs)
 - › Data Information (metObs)
- › Oceanographic Observation
- › Lightning data
- › Climate data
- › Radar Data
- › Forecast Data

stationId	Narrow the search to a specific station ID	stationId=SOME_ID	Example: https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?stationId=SOME_ID Description: Returns observations for the station with the ID
datetime	Narrow the search to a date range or a specific date. The range can	datetime=START_DATE/END_DATE datetime=../END_DATE datetime=START_DATE/.. datetime=DATE	Example: https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?datetime=2018-02-12T00:00:00Z/2018-03-18T00:00:00Z Description: Returns observations within the dates UTC 2018-02-12 at midnight to 2018-03-18 at midnight. Both dates are inclusive.

05735	Livgardens Kaserne	DNK	DMI	Pluvio	Active	6
-------	--------------------	-----	-----	--------	--------	---

<https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?datetime=2018-02-12T00:00:00Z/2018-03-18T00:00:00Z>

<https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?datetime=2019-01-01T00:00:00Z/2019-12-31T00:00:00Z&stationId=057355>

Data-retrieval CASE:

Proto type



DMI Open Data Developers portal

Let's start to use "metObsAPI" with "SMK DMI"!

3

You can access the API using the following API Key:: `f76cb11d-5c0f-494f-abfe-2cbfda38eed5`

Request sample using curl:

```
curl -X GET "https://dmigw.govcloud.dk/v2/metObs" -
H "X-Gravitee-API-Key: f76cb11d-5c0f-494f-abfe-2cbfda38eed5"
```

```
1 {
2   "type": "FeatureCollection",
3   "features": [
4     {
5       "geometry": {
6         "coordinates": [
7           9.7875,
8           56.1496
9         ],
10      "type": "Point"
11    },
12    "id": "3443db25-0689-fe40-3ebd-731665e5e4d5",
13    "type": "Feature",
14    "properties": {
15      "created": "2022-02-22T18:55:50.406006Z",
16      "observed": "2019-10-07T00:00:00Z",
17      "parameterId": "precip_past1h",
18      "stationId": "05185",
```

```
(base) ~ @ 10153-62 (thor)
=> curl -X GET "https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?stationId=05185&datetime=2019-10-01T00:00:00Z/2019-10-07T00:00:00Z" -s | python -mjson.tool
```

```
18017   "type": "application/geo+json",
18018   "title": "Next set of results"
18019 }
18020 ]
18021 }
```

Data-retrieval CASE:

Proto  type

DMI Open Data Developers portal

```
-----
:00Z&api-key=6b30cc3d-800f-4d8f-80a2-3a498de37b47&offset=100
18016         "rel": "next",
18017         "type": "application/geo+json",
18018         "title": "Next set of results"
18019     }
18020 ]
18021 }
```

18021 linjer ...

Investigate some more!

Data-retrieval CASE: Investi gate



DMI Open Data Developers portal

<https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?datetime=2019-01-01T00:00:00Z/2019-12-31T00:00:00Z&stationId=057355&api-key=6b30cc3d-800f-4d8f-80a2->

parameterId

Narrow the search to a specific parameter id

parameterId=SOME_ID

Example: https://dmigw.govcloud.dk/v2/metObs/collections/parameterId=pressure_at_sea

Description: Returns observations having the parameter ID pressure reduced to mean sea level)

<https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?datetime=2019-01-01T00:00:00Z/2019-12-31T00:00:00Z&stationId=057355&api-key=6b30cc3d-800f-4d8f-80a2->

	created	operationFrom	operationTo	updated	validFrom	validTo	
6	2022-02-25T14:23:15Z	2010-01-14T00:00:00Z	n/a	n/a	2019-10-25T10:54:22Z	n/a	n/a
6	2022-02-25T14:23:15Z	1983-06-16T00:00:00Z	n/a	n/a	2019-01-15T13:34:48Z	n/a	

Data-retrieval CASE:

Proto type

DMI Open Data Developers portal

		terrain		
temp_max_past12h	°C	Last 12 hours maximum air temperature measured 2 m above ground. Measured at 0600 and 1800 UTC.	Twice a day	X

```
| => echo $tturl
https://dmigw.govcloud.dk/v2/metObs/collections/observation/items?
parameterId=temp_max_past12h&stationId=06180&datetime=2019-01-01T0
0:00:00Z/2019-12-31T00:00:00Z&api-key=6b30cc3d-800f-4d8f-80a2-3a49
8de37b47
```

```
| ~ @ 10153-02 (UNOI)
| => grep observe 12hm
      "observed": "2019-12-30T18:00:00Z",
      "observed": "2019-12-30T06:00:00Z",
      "observed": "2019-12-29T18:00:00Z",
      "observed": "2019-12-29T06:00:00Z"
```

```
"observed": "2019-01-02T18:00:00Z",
"observed": "2019-01-02T06:00:00Z",
"observed": "2019-01-01T18:00:00Z",
"observed": "2019-01-01T06:00:00Z",
```

(base)

Men jo kun om dagen?

Data-retrieval CASE:

Data store

DMI Open Data Developers portal

En fil i formatet JSON på
13125 linjer

```

1 {
2   "type": "FeatureCollection",
3   "features": [
4     {
5       "geometry": {
6         "coordinates": [
7           12.6455,
8           55.614
9         ],
10      "type": "Point"
11    },
12    "id": "71c8dc29-2972-8e4b-79a1-19190af02de4",
13    "type": "Feature",
14    "properties": {
15      "created": "2022-02-23T06:25:43.486815Z",
16      "observed": "2019-12-30T18:00:00Z",
17      "parameterId": "temp_max_past12h",
18      "stationId": "06180",
19      "value": 7.4
20    }
21  },
13120    "rel": "next",
13121    "type": "application/geo+json",
13122    "title": "Next set of results"
13123  }
13124 ]
13125

```

Data-retrieval CASE:

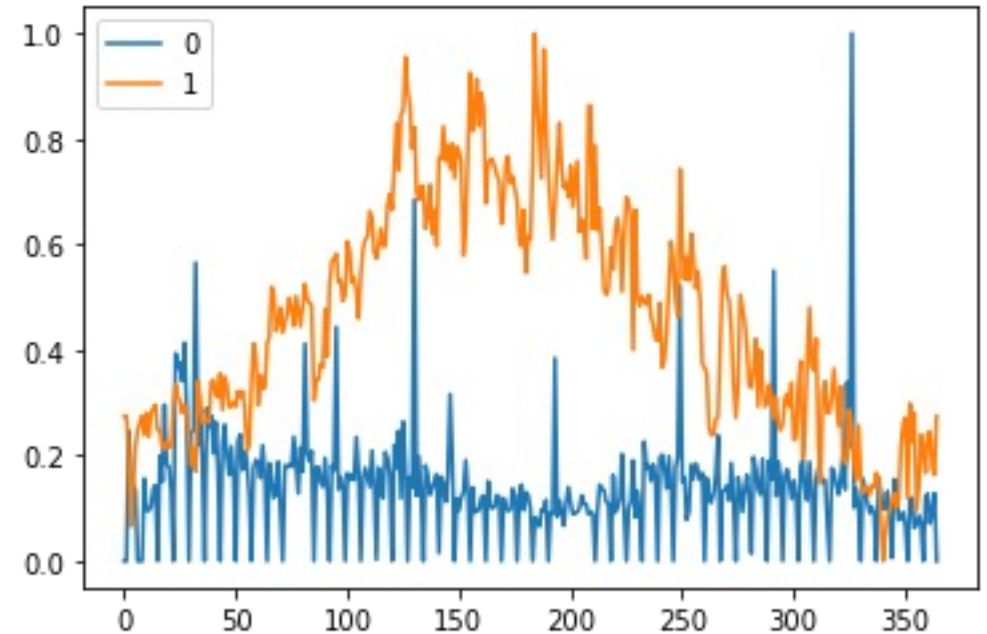
Data prep

DMI Open Data Developers portal

En fil i formatet csv på
365 linjer

	A	B	C
1	Date	Visitors	temp
2	31.dec.19	0	7.4
3	30.dec.19	0	7.4
4	29.dec.19	1872	4.6
5	28.dec.19	1264	0.4
6	27.dec.19	1082	2.7
7	26.dec.19	1026	5.4
8	25.dec.19	0	6.5
9	24.dec.19	0	7
10	23.dec.19	0	7.4
11	22.dec.19	1182	6.2

	visitors	temp
0	0.000000	0.274627
1	0.000000	0.274627
2	0.247031	0.191045
3	0.166799	0.065672
4	0.142782	0.134328
...
360	0.127342	0.241791
361	0.071127	0.244776
362	0.094748	0.176119
363	0.128266	0.164179
364	0.000000	0.274627



$$x' = \frac{x - \min(x)}{\max(x) - \min(x)}$$

Data-retrieval CASE:

Proto type

DMI Open Data Developers portal



dmi open api tutorial

<https://predictablysunny.com> › posts ▼ [Oversæt denne side](#)

DMI API Tutorial - Predictably Sunny

This **tutorial** gives an introduction on how to use the Danish Meteorological Institute's (DMI) API to download meteorological observation **data** (v2).



Adam R. Jensen

Solar | Storage | Open Science

I work with measurement and modeling of solar energy systems and the solar resource.

```
In [2]: import requests # library for making HTTP requests
import pandas as pd # library for data analysis
import datetime as dt # library for handling date
```

```
In [3]: api_key = '6b30cc3d-800f-4d8f-80a2-3a498de37b47' ;
```

```
In [4]: DMI_URL = 'https://dmigw.govcloud.dk/v2/metObs/co:
r = requests.get(DMI_URL, params={'api-key': api_
print(r, r.url)
```

```
In [5]: json = r.json() # Extract JSON data
print(json.keys()) # Print the keys of the JSON dictionary

dict_keys(['type', 'features', 'timeStamp', 'numberReturned'])
```

```
In [6]: json['features'][:2]
```

```
Out[6]: [{'geometry': {'coordinates': [8.0828, 55.5575], 'type': 'Po:
'id': '00000001-30ad-ae74-5b33-7ef0ala6ef92',
'type': 'Feature',
'properties': {'created': '2022-02-23T04:38:59.325752Z',
'observed': '2015-09-11T10:10:00Z',
'parameterId': 'temp_dew',
'stationId': '06081',
'value': 11.4}},
```