Outline

Part 1 - Collecting data from an API

Part 2 - Wrapping an API with R

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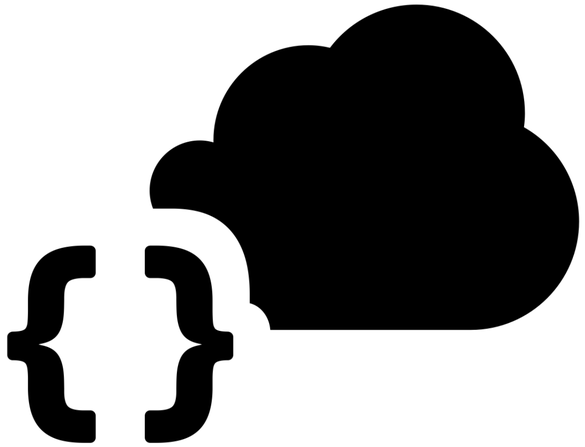
Part II: Getting data from the web



Karthik Ram

@_inundata

1. Making **GET** requests
2. **Extracting web content**
3. Passing **additional query parameters** and **API** keys

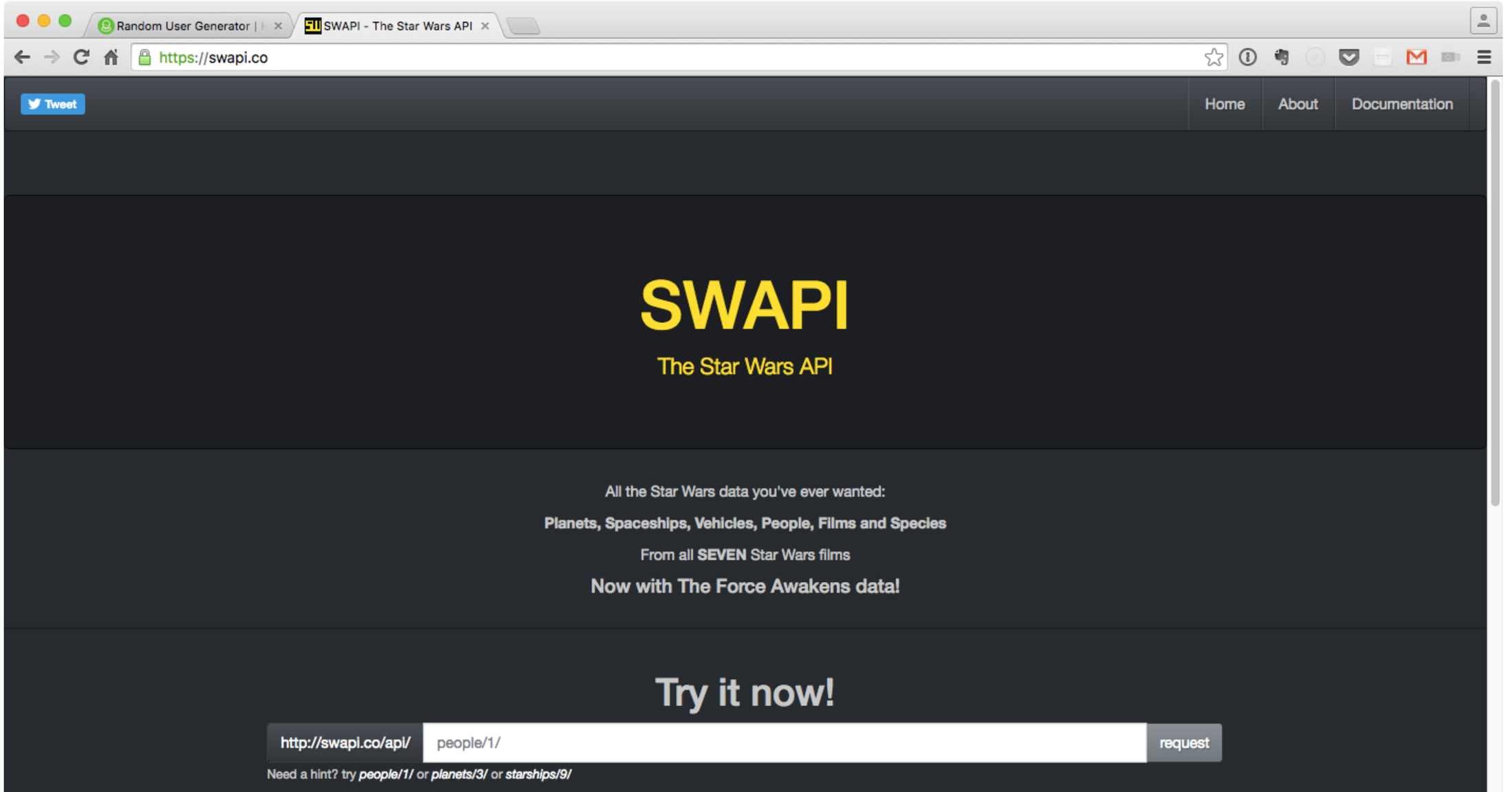
APIs and end points

The Internet Movie database

Producers Movies Actors


End points

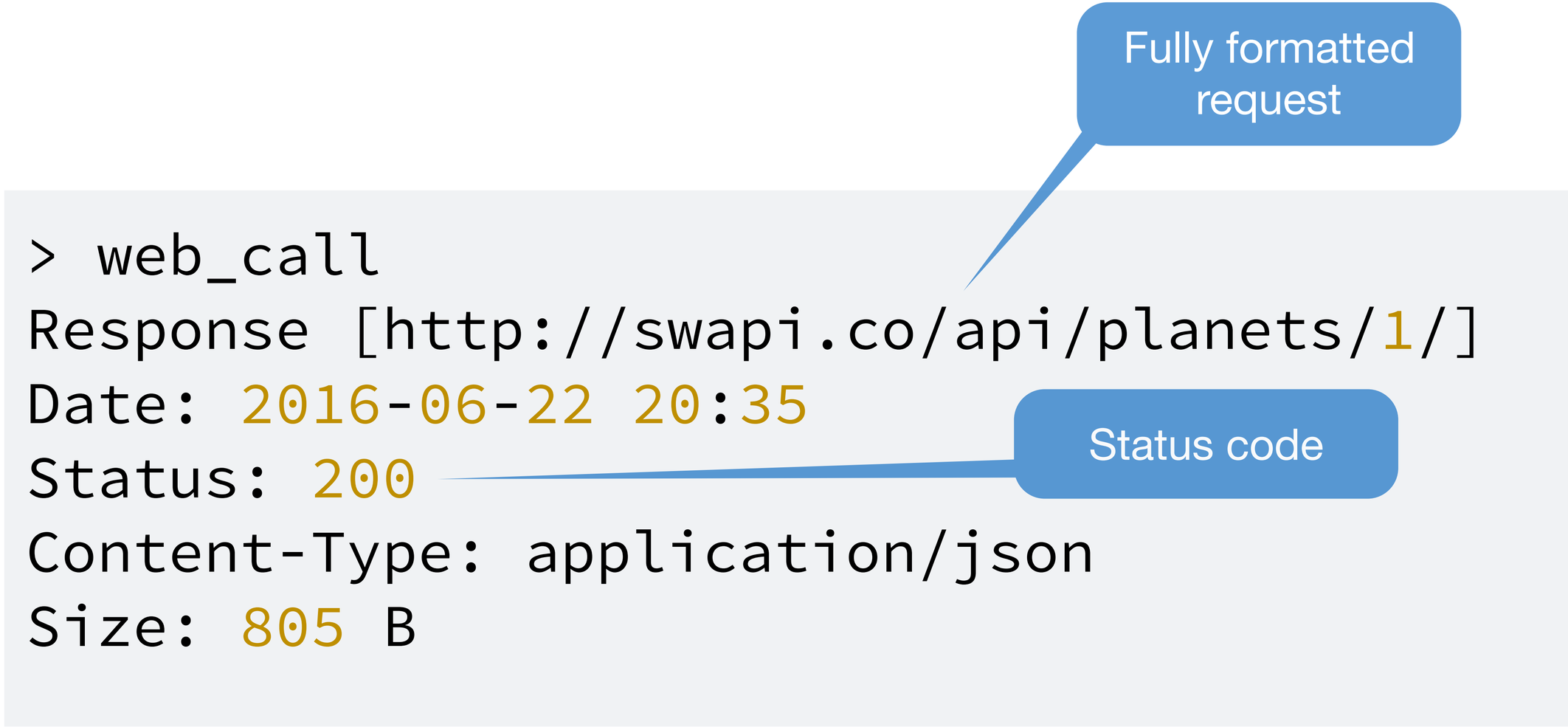
Writing a GET request


Random User Generator |
SWAPI - The Star Wars API
https://swapi.co
Tweet
Home
About
Documentation
SWAPI
The Star Wars API
All the Star Wars data you've ever wanted:
Planets, Spaceships, Vehicles, People, Films and Species
From all SEVEN Star Wars films
Now with The Force Awakens data!
Try it now!
http://swapi.co/api/
people/1/
request
Need a hint? try people/1/ or planets/3/ or starships/9/

Step 1: Write a web request

```
web_call <- GET('http://swapi.co/api/planets/1/')
web_call
```

```
> web_call
Response [http://swapi.co/api/planets/1/]
Date: 2016-06-22 20:35
Status: 200
Content-Type: application/json
Size: 805 B
```


Fully formatted request
> web_call
Response [http://swapi.co/api/planets/1/]
Date: 2016-06-22 20:35
Status: 200
Status code
Content-Type: application/json
Size: 805 B

Now your turn

Run a GET request against these end points

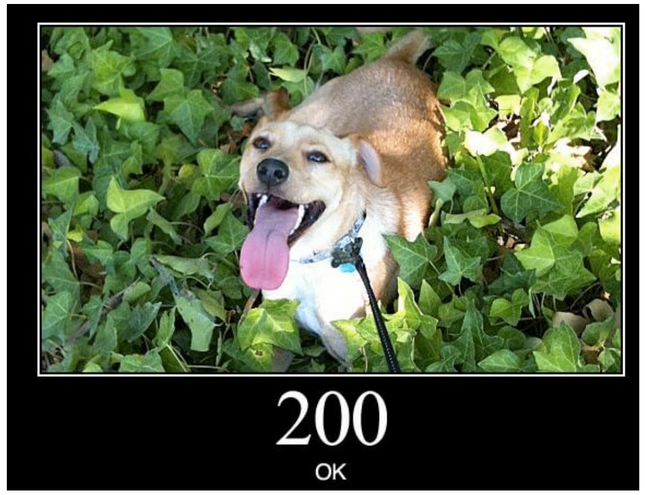
```
api.randomuser.me
api.openweathermap.org/data/2.5/forecast?id=524901
```

What does your result object contain?
What are the response codes?
What do they mean?

```
result <- GET('api.randomuser.me')
status_code(result)

result_2 <- GET('api.openweathermap.org/data/
2.5/forecast?id=524901')
status_code(result_2)
```

See full list of codes: httpstatuses.com



2×× SUCCESS

200 OK

The request has succeeded.

The payload sent in a 200 response depends on the request method.

4×× CLIENT ERROR

403 FORBIDDEN

The server understood the request but refuses to authorize it.

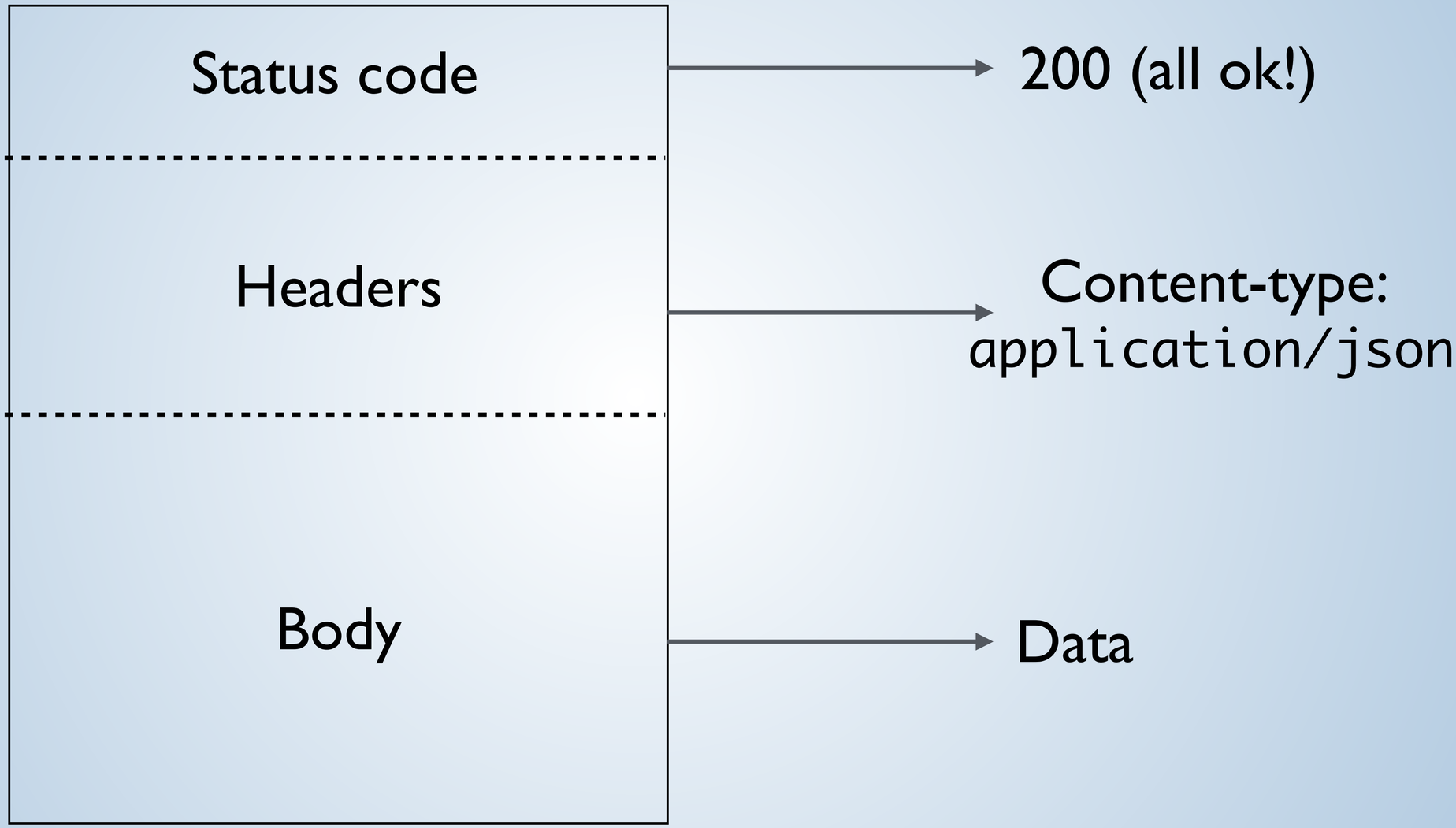
A server that wishes to make public why the request has been forbidden can describe that reason in the response payload (if any).

If authentication credentials were provided in the request, the server considers them insufficient to grant access. The client SHOULD NOT automatically repeat the request with the same credentials. The client MAY repeat the request with new or different credentials. However, a request might be forbidden for reasons unrelated to the credentials.

Pro tip

```
stop_for_status(request)
warn_for_status(request)
```

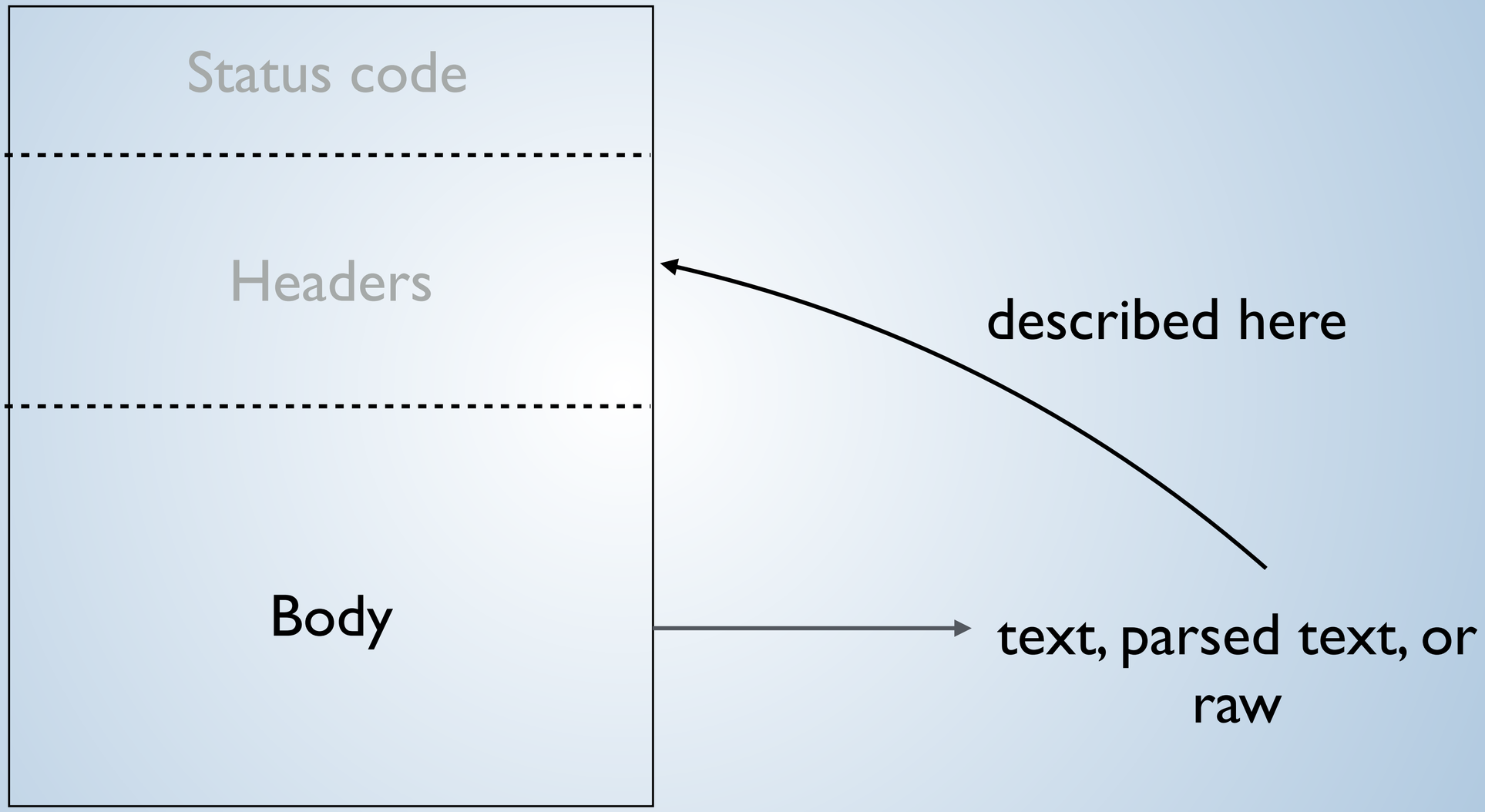
2: Extracting content


Status code
Headers
Body
200 (all ok!)
Content-type:
application/json
Data

Response

Step 2: Extract content from a request

text - *a character vector*
raw - *as a raw object*
parsed - *parsed into a R object*


Status code
Headers
Body
described here
text, parsed text, or raw

Text formats

```
text/html: read_html
text/xml: read_xml
text/csv: read_csv
text/tab-separated-values: read_tsv
application/json: fromJSON
```

Local R handler

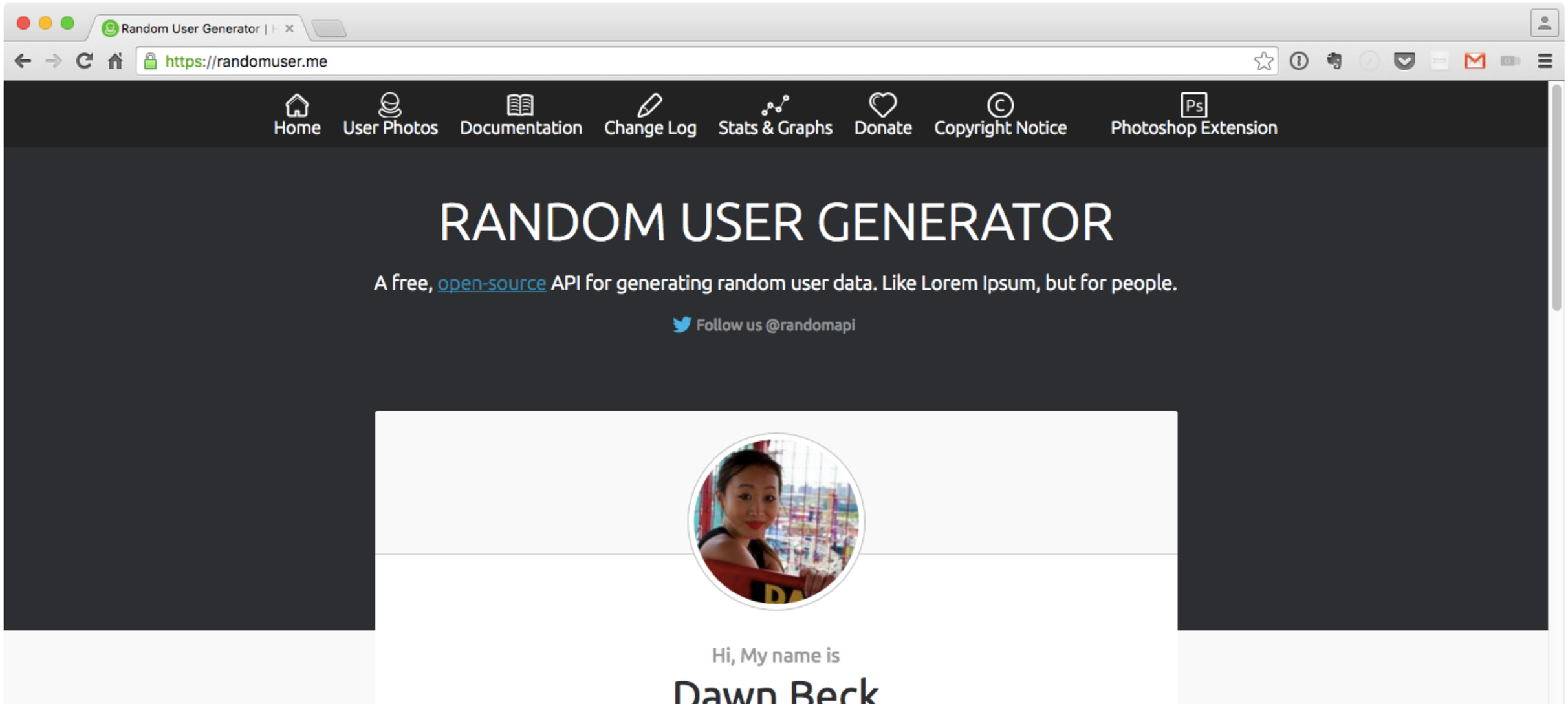
Content type

Image formats

```
image/jpeg: readJPEG
image/png: readPNG
```

```
> call <- GET("http://google.com")
> result <- content(call, as = 'text')
> result
[1] "<!doctype html><html itemscope=\"\" itemtype=\"http://
schema.org/WebPage\" lang=\"en\"><head><meta content=\"Search the
world's information, . <truncated>
> class(result)
[1] "character"
```

api.randomuser.me



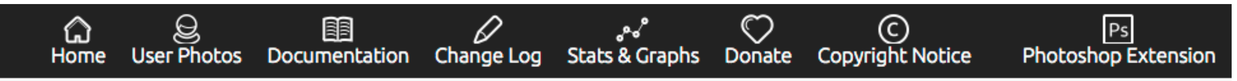
Exercise

Process the content from the random user API

Save the result into an object called `person`

Extract the content as text and parsed.

Passing arguments



Requesting Multiple Users

Random User Generator allows you to fetch up to 5,000 generated users in one request using the **results** parameter.

```
http://api.randomuser.me/?results=5000
```

results: *Retrieve multiple names*

Specifying a gender

You can specify whether you would like to have only male or only female users generated by adding the **gender** parameter to your request. Valid values for the gender parameter are "male" or "female", or you may leave the parameter blank. Any other value will cause the service to return both male and female users.

```
http://api.randomuser.me/?gender=female
```

gender: *specify a gender*

Seeds

Seeds allow you to always generate the same set of users. For example, the seed "foobar" will always return results for Becky Sims (for version 1.0). Seeds can be any string or sequence of characters.

```
http://api.randomuser.me/?seed=foobar
```

seed: *Set a seed*

Formats

We currently offer the following data formats:

```
num_results <- 5
args <- list(results = num_results)
random_names <- GET("http://api.randomuser.me/",
query = args)
output <- content(random_names, as = 'parsed')
> length(output$results)
[1] 5
```

Exercise

Look over the api documentation and see what other parameters can be passed

Modify the example to pass a `gender` to the request

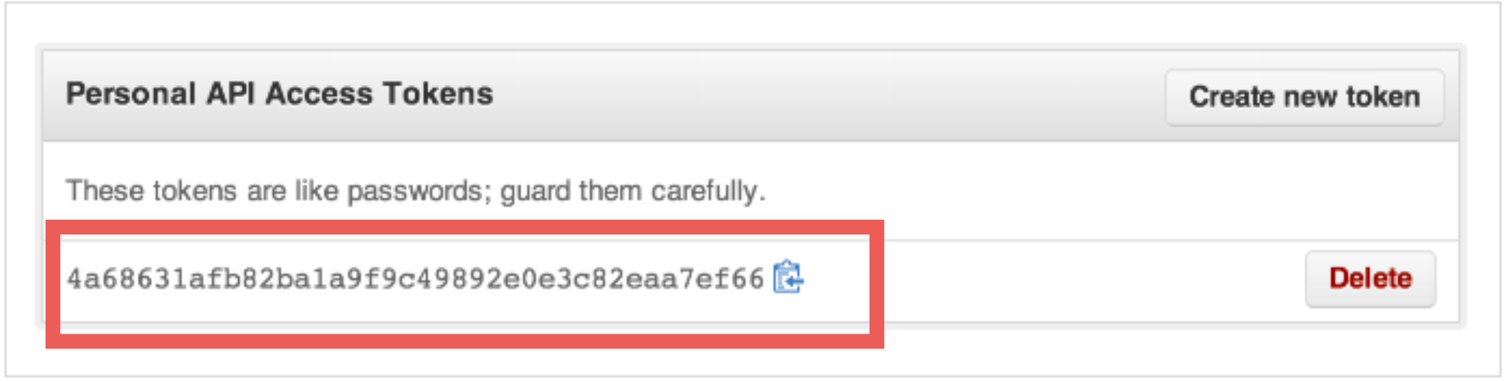
Can you do this with both number of results and gender?

Personal Open source Business Explore Pricing Blog Support Search Gi

Personal API tokens

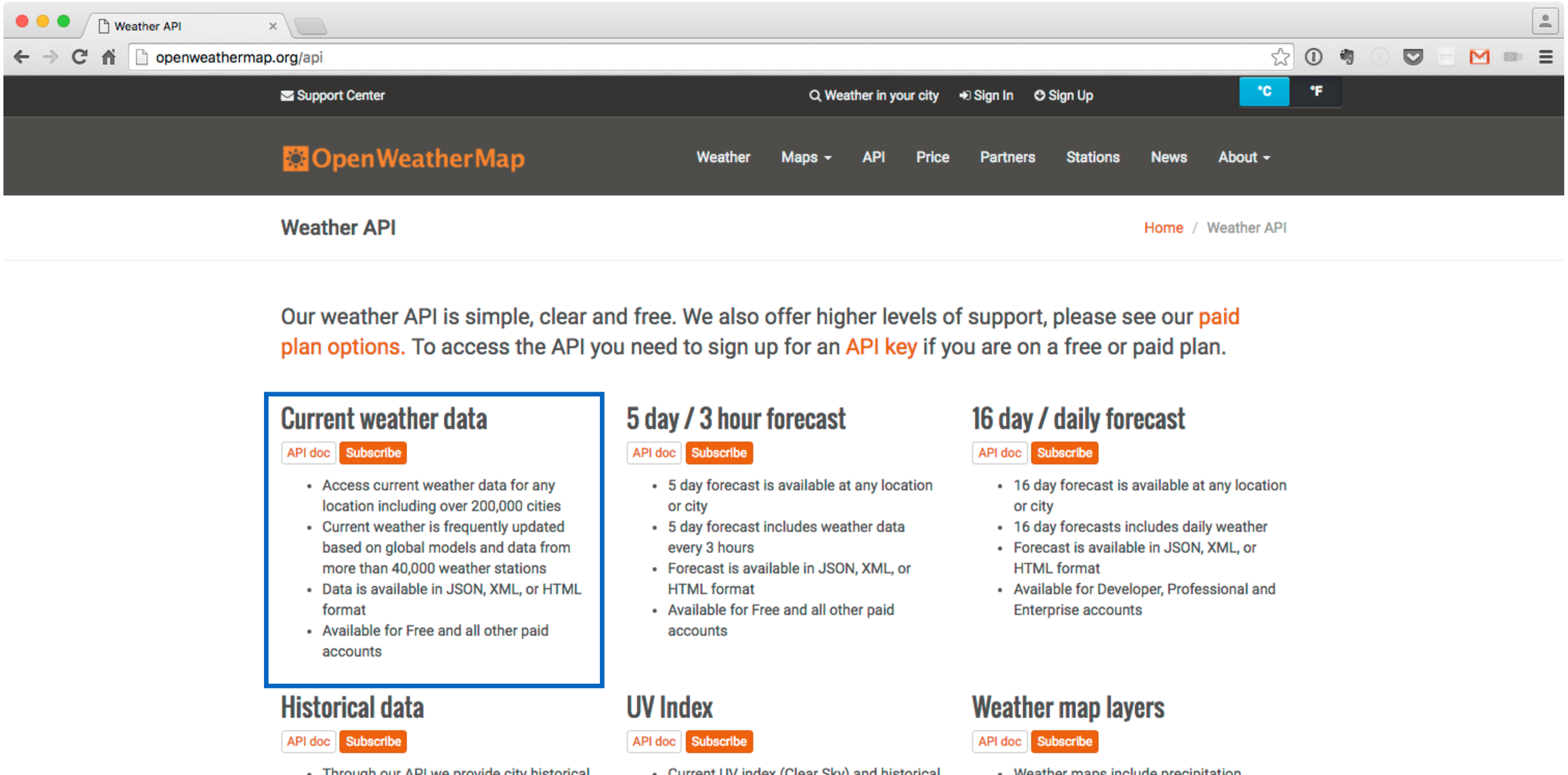
May 16, 2013 tclem New Features

You can now create your own personal API tokens for use in scripts and on the command line. Be careful, these tokens are like passwords so you should guard them carefully. The advantage to using a token over putting your password into a script is that a token can be revoked, and you can generate lots of them. Head on over to your settings to manage personal API tokens.



Write a complete request to a proper API

Open Weather example



Exercise

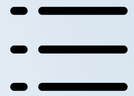
- Get a API key from `openweathermap.org/api`
- Write a request for current weather data (http://openweathermap.org/current) for zip code `94708,us`
- Pass
- Format results into a `data.frame` (for help with this, see: bit.ly/flatten_json)

Tip: Pass the API key as:

```
APPID <- '<your_api_key>'
```

Recap

Make a `GET` request

Pass additional **arguments** to a end point 

Authenticate with a **API** key or `oauth2` **token**

Check for **status**

Then **process content** as 

Format results 

Thanks!