Open knowledge in R with Wikimedia APIs

Mikhail Popov

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Wikimedia Foundation

Introduction

Wikimedia Foundation is a non-profit that operates free & open projects like Wikipedia, Wiktionary, and Wikidata that anyone can contribute to

No time to talk about me (plus that's always the boring part)[1]

A Markdown copy of this deck is at git.io/vSi6a for following along

R packages required to follow along:

```
install.packages(
  c("pageviews", "WikipediR", "WikidataR",
    "WikidataQueryServiceR", "magrittr"),
  repos = c(CRAN = "https://cran.rstudio.com")
)
```

[1] If you're **really** curious just search for User:MPopov (WMF) on Meta-Wiki

Session Info

- Running R 3.4.0 on macOS Sierra 10.12.4
- Rendered with rmarkdown 1.4 and knitr 1.15.1
- The pipe (%>%) from magrittr is **occasionally** used
- Using the following versions of packages for demos:

Package	Version	Imports
pageviews	0.3.0	jsonlite, httr, curl
WikipediR	1.5.0	httr, jsonlite
WikidataR	1.2.0	httr, jsonlite, WikipediR, utils
WikidataQueryServiceR	0.1.0	httr, dplyr, jsonlite

Pageviews

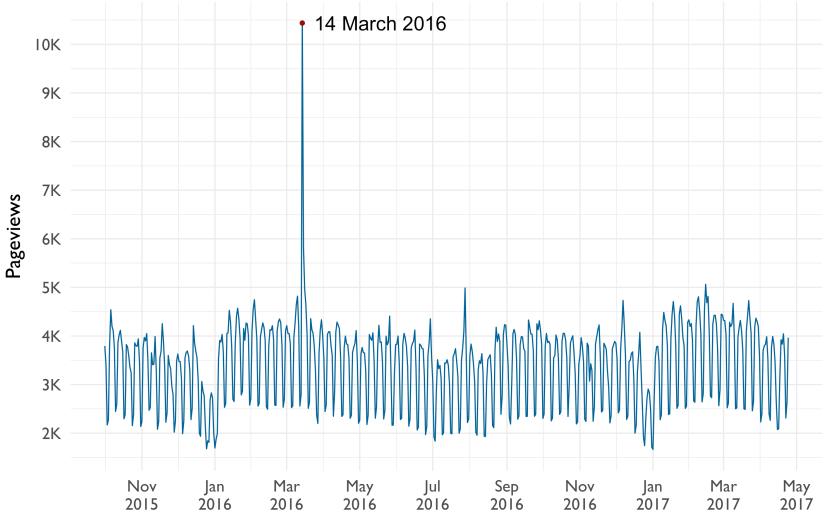
WMF provides an API for accessing daily and monthly pageviews of any article on any project for counts from 2015 onwards.[2] The package pageviews allows you to get those counts in R:

```
library(pageviews)
r_pageviews <- article_pageviews(
  project = ”en.wikipedia”,
  article = ”R (programming language)”,
  user_type = ”user”, start = ”2015100100”,
  end = format(Sys.time(), ”%Y%m%d%H%M00”)
)
```

[2] wikipediatrend package wraps the stats.grok.se API which has historical Wikipedia pageview data for 2008 up to 2016 from these pageview count dumps.

Daily pageviews of R's entry on English Wikipedia

Desktop and mobile traffic, excluding known bots



Wikidata

- Wikidata is a language-agnostic open knowledge base
- Facts are expressed as 3-part statements:
  - Subject (resource)
  - Predicate (property type)
  - Object (property value, can be another resource)
- Examples:
  - "R" (Q206904) is an "instance of" (P31) a "programming language" (Q9143)
  - "RStudio" (Q4798119) was "programmed in" (P277) "C++" (Q2407)
  - "Portland" (Q6106) had a "population" (P1082) of 583,776 (in 2010)
- Resources and properties have unique numeric identifiers but can have human-friendly labels in any language

Wikidata Query Service (WDQS)

- Allows querying Wikidata with SPARQL
- Provides a public SPARQL endpoint usable via:
  - Web front-end: query.wikidata.org
  - Web API (`https://query.wikidata.org/sparql?query=<SPARQL>`)
  - In Python with SPARQLWrapper
  - In R with:
    - SPARQL package
    - WikidataQueryServiceR
- For useful reference links, see `help(”WDQS”, package = ”WikidataQueryServiceR”)`

Basic SPARQL Example

```
# PREFIXes are optional when using WDQS
PREFIX wd: <http://www.wikidata.org/entity/>
PREFIX wdt: <http://www.wikidata.org/prop/direct/>
PREFIX wikibase: <http://wikiba.se/ontology#>
PREFIX bd: <http://www.bigdata.com/rdf#>

SELECT DISTINCT ?instanceOfLabel
WHERE {
  wd:Q206904 wdt:P31 ?instanceOf .
  SERVICE wikibase:label {
    bd:serviceParam wikibase:language ”en”
  }
}
```

```
library(WikidataQueryServiceR)
query_wikidata('SELECT DISTINCT ?instanceOfLabel
WHERE {
  wd:Q206904 wdt:P31 ?instanceOf .
  SERVICE wikibase:label {
    bd:serviceParam wikibase:language ”en”
  }
}') %>% head(n = 5L)
```

```
##                      instanceOfLabel
## 1               programming language
## 2                      free software
## 3 multi-paradigm programming language
## 4               interpreted language
## 5     functional programming language
```

Advanced SPARQL Example

- Prefix **wd:** points to an entity
- Prefix **p:** points not to the object, but to a statement node
- Prefix **ps:** within the statement node retrieves the object (value)
- Prefix **pq:** within the statement node retrieves the qualifier info

```
r_versions_query <- "SELECT DISTINCT
  ?softwareVersion ?publicationDate
WHERE {
  BIND(wd:Q206904 AS ?R)
  ?R p:P348 [
    ps:P348 ?softwareVersion;
    pq:P577 ?publicationDate
  ] .
}"
```

```
r_versions_results <- query_wikidata(r_versions_query)
```

Results

softwareVersion	publicationDate
1.0.0	2000-02-29T00:00:00Z
2.0.0	2004-10-04T00:00:00Z
2.15.3	2013-03-01T00:00:00Z
…	…
3.3.2	2016-10-31T00:00:00Z
3.3.3	2017-03-06T00:00:00Z
3.4.0	2017-04-21T00:00:00Z

Final Remarks

Source for the whole shebang is up on GitHub: bearloga/wmf, available under CC BY-SA 4.0

Specifically: wmf/presentations/talks/Cascadia R Conference 2017/

Contact Info

- Twitter: bearloga
- WMF-related: mikhail@wikimedia.org
  (PGP public key: people.wikimedia.org/~bearloga/public.asc)
- General: mikhail@mpopov.com
  (PGP public key on keybase.io/mikhailpopov)