An illustration of two stylized human figures. The figure on the left is wearing a blue cap and a grey long-sleeved shirt. The figure on the right is wearing a grey long-sleeved shirt and light blue pants. Both are holding blue rectangular devices, possibly tablets or smartphones. The background consists of large, light blue, rounded shapes.

Fancy a sustainable cultural heritage project for your town (in minutes)?

Linked data and international standards for cultural heritage

Brussels, 13 Sep 2022

Martin Alvarez ([@espinr](#))

About me

Dataset Catalog Vocabulary

This Version

http://data.fundacionctic.org/vocab/catalog/datasets_20090928 [HTML] [RDF]

Latest Version

<http://data.fundacionctic.org/vocab/catalog/datasets#>

Author(s)

Martin Alvarez-Espinar (CTIC CT)

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Table of Contents

- [Introduction](#)
- [Namespace](#)
- [Summary of Terms](#)
- [Vocabulary Classes](#)
- [Vocabulary Properties](#)
- [RDF Schema](#)
- [License](#)

Introduction

This vocabulary is used for modelling catalogs of datasets and its relationships with the datasets

Changes From Previous Version

- 2009-09-28 - first issued

IT Engineer

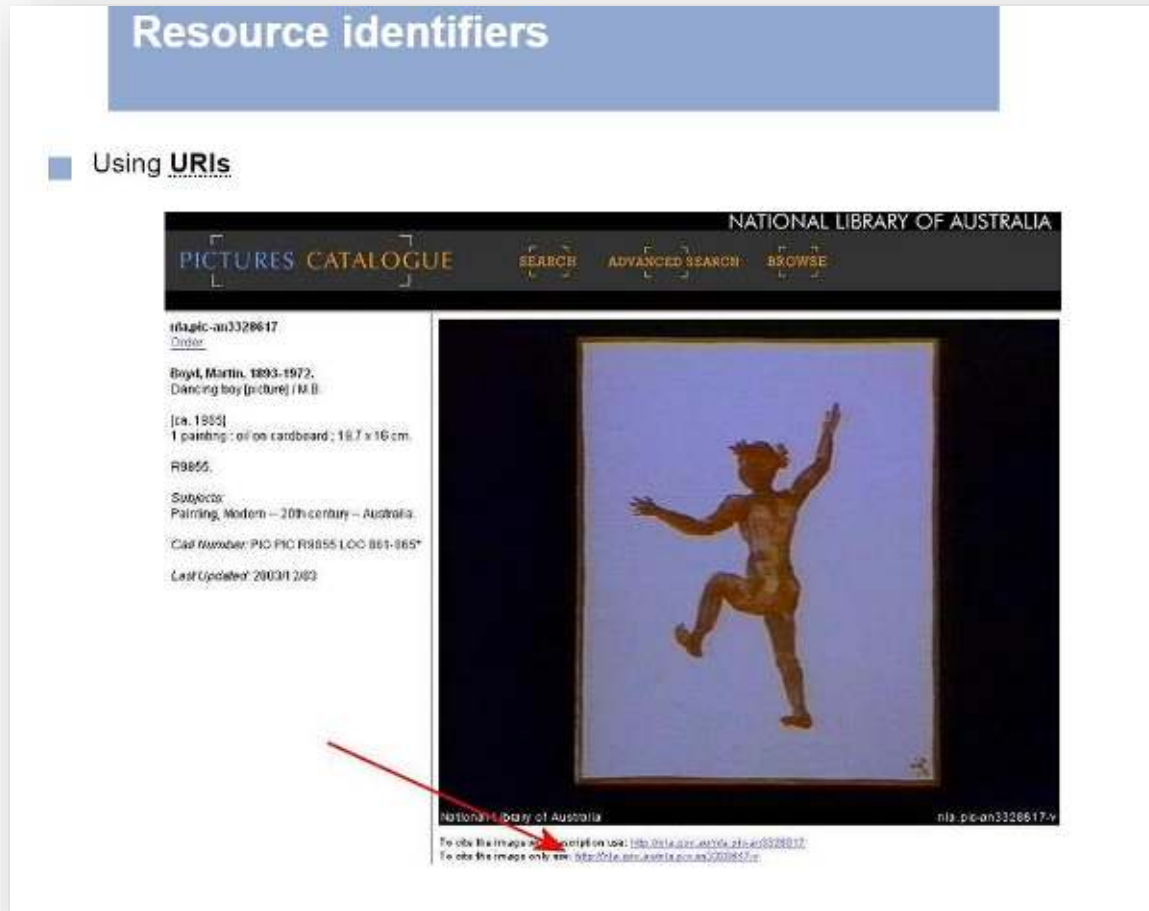
Web Standards

Open Data advocate

Linked Data advocate

Quick App Initiative

About me



Talk at **Workshop on Digital Libraries and Access to New Content** (Barcelona, Oct 2005)

<https://espinr.github.io/talks/2005/1018-WebSemanticaREBIUN-MA/index.html>

IT Engineer

Web Standards

Open Data advocate

Linked Data advocate

Quick App Initiative

Some background

Fancy a sustainable cultural heritage project for your town (in minutes)?

Local communities are proud of their culture and history

Every town/region has dozens of items in the streets (artworks or not) representing its history

- > Statues, old buildings, bridges... but also
- > castles, vineyards, gardens...

We all want to **preserve our cultural heritage**

Artworks may be lovely, but the origin and the history are the most relevant part... **unknown to most of visitors.**

Archives help, but also the local experts



'De Koeieschieter' ('Cow Shooter')

A story from 1691 that explains why Leuven's people were nicknamed koeschieters or cow-shooters.

Hidden (inaccessible?) gems

- Accessibility
- Multilingual



Difficulties to understand foreign languages



Not easy to discover the non-popular monuments

ICT as an ally to understand details

Easy to collect contextual information

- Geolocation
- Environment
- Type of user (visitor, expert, citizen...)

Easy to visualize data:

- Images and descriptions (also accessible)
 - XR
- Large cities already have tourism apps and tools.
Most of small/medium cities usually do not have enough IT resources... but they always have good experts and enthusiasts.



ICT as an ally to understand details

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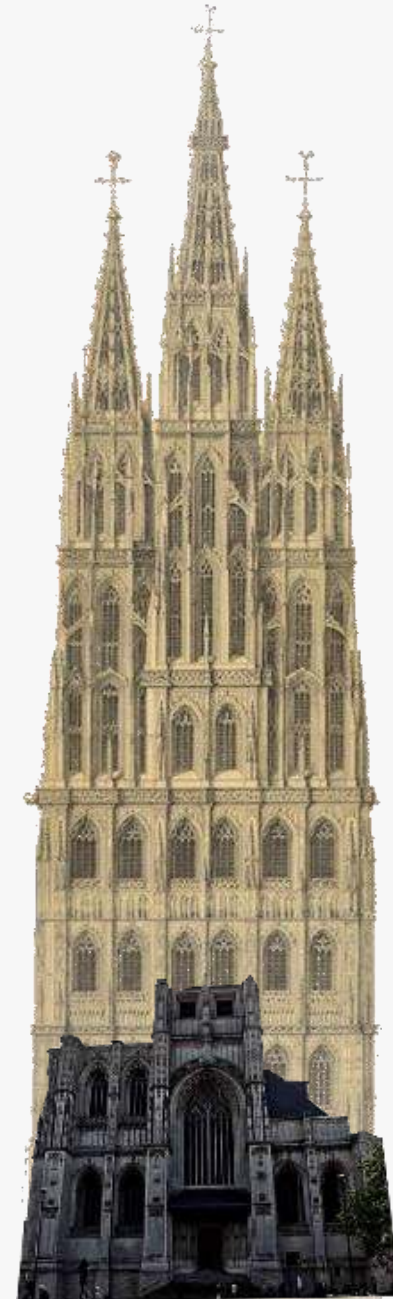
ICT as an ally to understand details

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Project's Objectives

Fancy a sustainable cultural heritage project for your town (in minutes)?

Local Cultural Heritage & History App

Objective: **tool and methodology to generate apps and services** for European towns promoting their local art, culture, history, or whatever...

Open (Linked) Data + Open Source + Crowdsourced + Sustainable

No-code: no development, just configuration (minimum IT skills required)

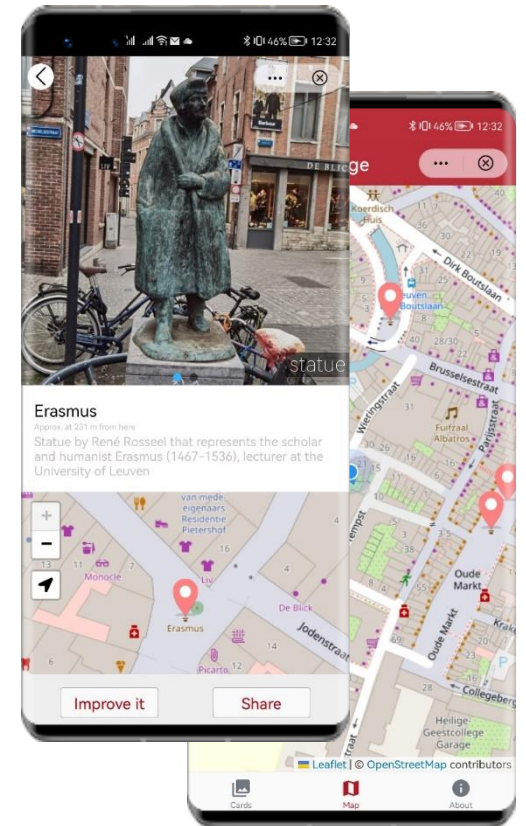
No-cost: design based on public resources

Community-driven: updates by the community

No maintenance costs (minimum moderation by volunteers/experts)

One app ≈ one-day effort (any citizen can launch a project)

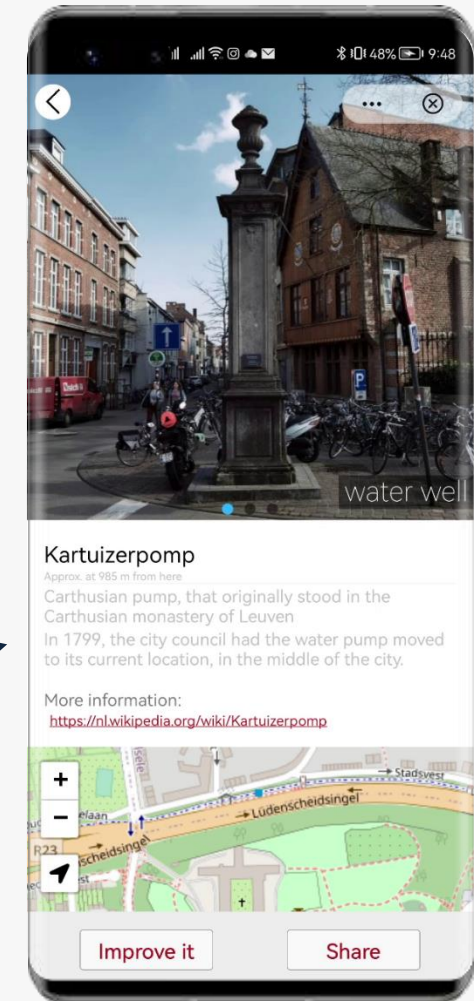
Templates to replicate the app in **other scenarios/places**



Let's understand the city

Proposing a new service for end-users (**locals** and **tourists**):

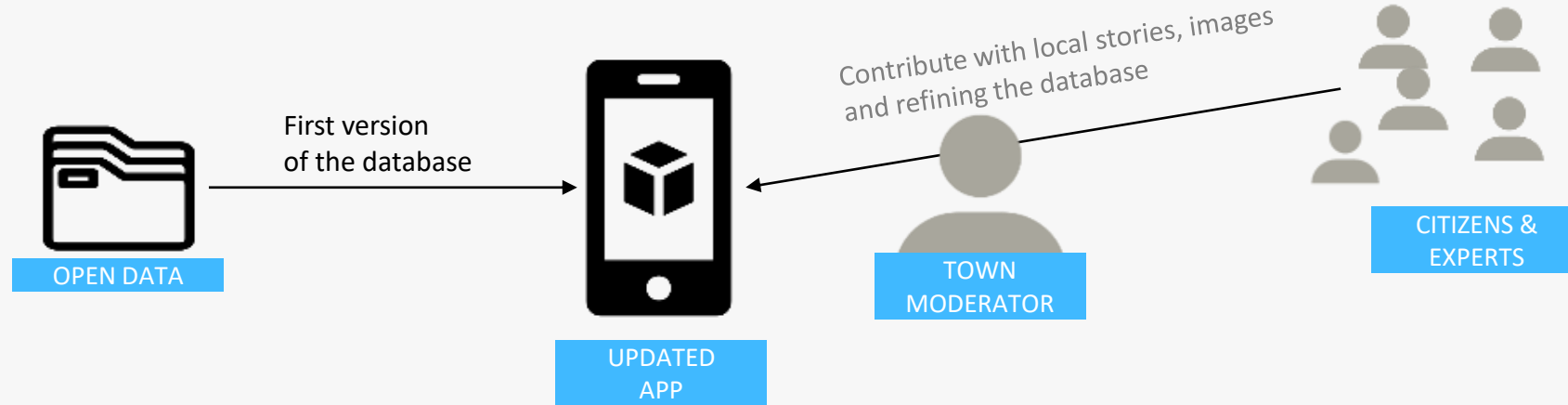
- ✓ **Direct** and simple: open and enjoy
- ✓ **Multilingual** interface and contents
- ✓ **Intuitive** user interface
- ✓ (Optional) Offline information in local Tourism offices
- ✓ (Optional) QR codes next to monuments to increase discoverability



Who can implement it?

Municipalities and regions (cultural **associations**, **governments**, and **enthusiasts**):

- ✓ **No-code, easy-to-deploy** application to show off their cultural, and artistic assets.
- ✓ **Free of charge**: no deployment and maintenance costs.
- ✓ **Reuse** of the existing open data (public libraries, open data project, Wikipedia...)
- ✓ **Crowdsourced and participative**: app that fosters the citizen's collaboration.
- ✓ **Adapted to the local needs**, like culture, language, and types of assets



First: The Data

Fancy a sustainable cultural heritage project for your town (in minutes)?

Data, what data?

Data and pictures extracted from:

- ✓ **Official open data** (hopefully)
- ✓ **Local experts with knowledge**
- ✓ **Crowdsourced data** → e.g. OSM →

The image displays three overlapping screenshots of the OpenStreetMap (OSM) website interface, illustrating data extraction and editing capabilities.

Top-left screenshot: Relation: Gijón (345576)

Version #51

Etiquetas: addr:country, code incompatible en elementos: boundary

Edited over 1 year ago by Hugoren Martinaka - import

Changeset #100131136

Tags

admin_level	8
boundary	administrative
idee:name	Gijón/Xixón
in:municipio	33024
name	Gijón/Xixón
name:ar	جيجون
name:ast	Xixón
name:ca	Gijón
name:el	Χιχόνη
name:es	Gijón
name:gl	Xixón
source	BOL25, EGRN, Instituto Geográfico Nacional
type	boundary
wikidata	Q12273

[Download XML](#) - [View History](#)

Top-right screenshot: Node: Estatua de Jovellanos (3330639418)

Version #3

Cambiado el nombre a Jovellanos, apellido verdadero de la persona representada en la estatua.

Edited over 5 years ago by qnuqwin

Changeset #49179027

Location: 43.5382096, -5.6632069

Tags

historic	memorial
memorial:type	statue
name	Estatua de Jovellanos
name:es	Estatua de Jovellanos

[Download XML](#) - [View History](#)

Bottom-right screenshot: Export

Search: [Where is this?](#) [Go](#) [+ Add](#)

Coordinates: 43.54008, -5.66485, -5.66172, 43.53846

[Manually select a different area](#)

Licence

OpenStreetMap data is licensed under the Open Data Commons Open Database License (ODbL).

[Export](#)

If the above export fails, please consider using one of the courses listed below.

Different fields of knowledge

It's not just architecture, politics, or art

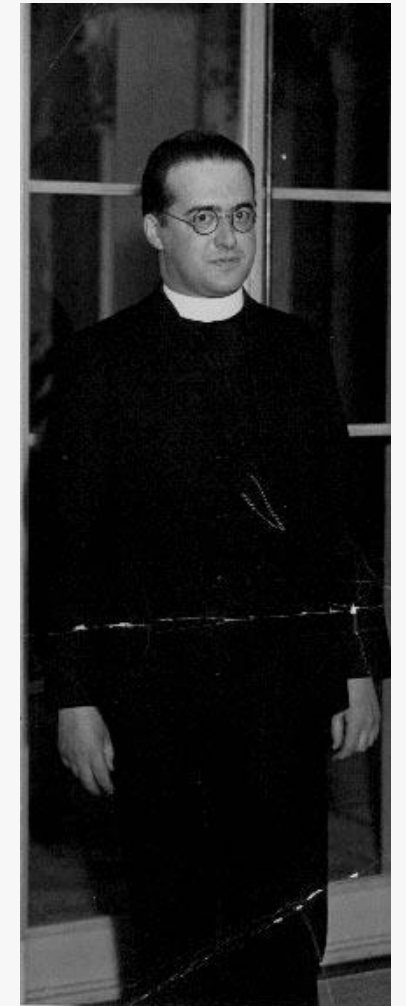
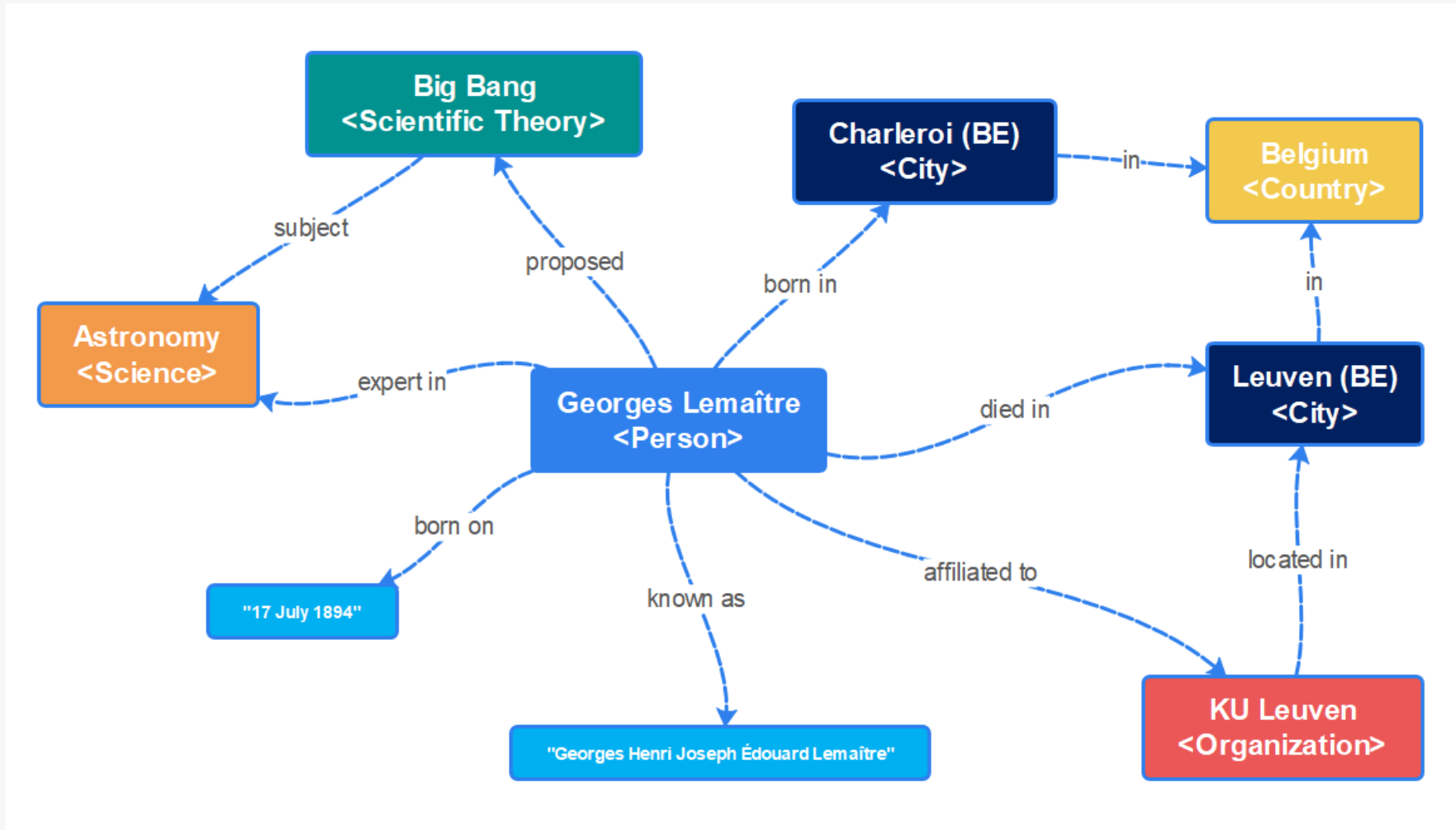
Statues, buildings, landscapes bring us **heterogeneous stories**

Challenge: with minimum resources, how to get accurate information

Jack-of-all-trades, master of none



Knowledge graphs and semantics to the rescue



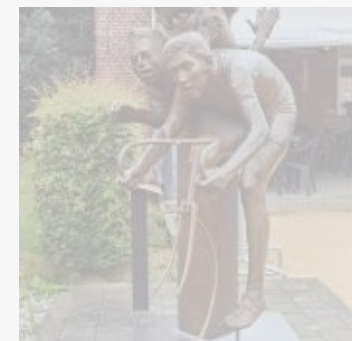
Different fields of knowledge

It's not just architecture, politics, or art

Statues, buildings, landscapes bring us **Why is this relevant?**


Challenge: with minimum resources, how to get accurate information

Jack-of-all-trades, master of none



This artwork is a tribute to Lemaitre, focused on astronomy

Wikidata, master of (almost) everything



Wikidata

- Main page
- Community portal
- Project chat
- Create a new item
- Recent changes
- Random item
- Query Service
- Nearby
- Help
- Donate

Lexicographical data

- Create a new Lexeme
- Recent changes
- Random Lexeme

Tools

- What links here
- Related changes
- Special pages
- Permanent link
- Page information
- Concept URI
- Cite this page

Item **Discussion** Read View history Search Wikidata

Georges Lemaître (Q12998)

Belgkian scilntist alnd prest (1894-1966) [edit](#)

Georges Lemaître | Georges Henri Joseph Édouard Lemaître | Georges Henri Joseph Edouard Lemaître

▼ In more languages

Configure

Language	Label	Description
English	Georges Lemaître	Belgkian scilntist alnd prest
Spanish	Georges Lemaître	sacerdote católico, astrofísico belga
Catalan	Georges Lemaître	sacerdot, astrofísic i matemà
German	Georges Lemaître	belgischer Wissenschaftler u

All entered languages

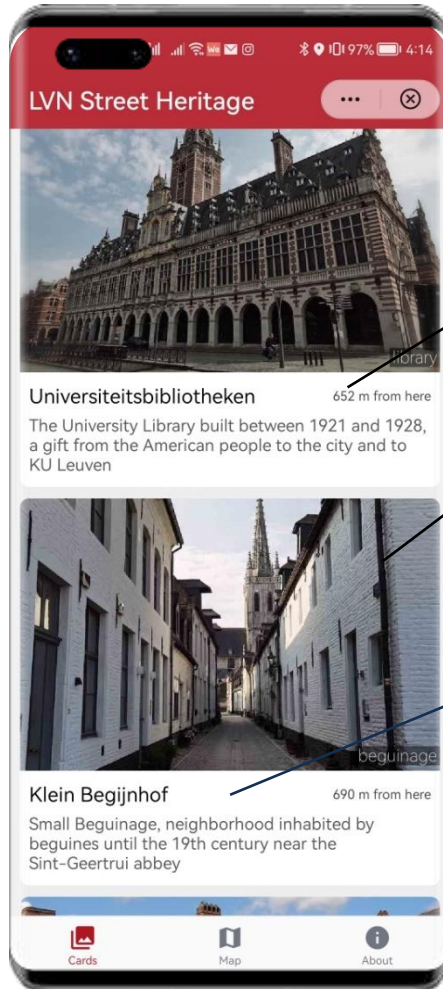
Also known as

Academic title ID		+ add reference
Angelskum ID	Q12998	edit
Arroben ID	Q12998	edit
Biographical Dictionary of Astronomers ID	Q12998	edit
Biographical Dictionary of Belgians ID	Q12998	edit
BNF person ID	Lemaître Georges 1894-1966	edit

Second: The App

Fancy a sustainable cultural heritage project for your town (in minutes)?

The App

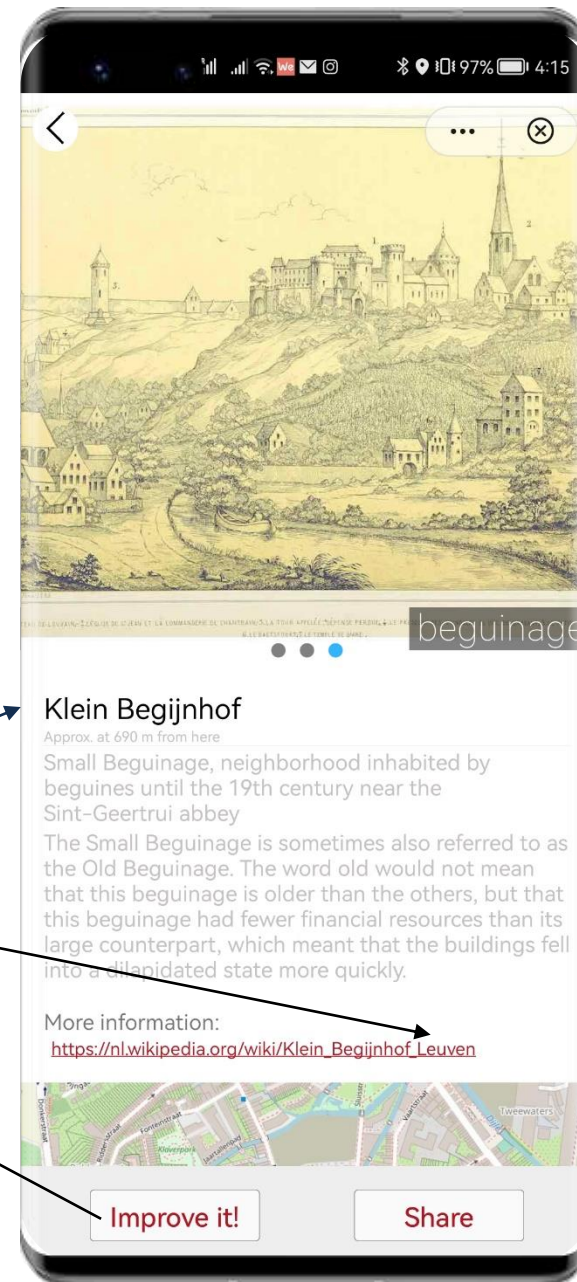


CONTEXTUAL
Points of Interest shown
by current distance

CROWDSOURCED
Images submitted by
citizens, tourists...

OPEN DATA
Public information and
images from local
archives, open data
initiatives

EXPERT'S INPUT
Anyone can share
their knowledge and
enrich the database



USEFUL
User's position
on the map and
the PoI



PROMOTION
Users can share the
content and a link with
their friends (Twitter,
WeChat, etc.)

Third: the methodology

Fancy a sustainable cultural heritage project for your town (in minutes)?

(GitHub)
PROJECT REPOSITORY
Hosted by the QAI
Guides and documents
Contains templates for:

- Quick App
- Database and setup



Step-by-step example (an easy one)

Fancy a sustainable cultural heritage project for your town (in minutes)?

Brussels' Comic Book Route

Since the early 90s, Brussels pays tribute to **characters and authors** of the Franco-Belgian comics on the walls in the city center

Objective:

- > Discover **paintings around you** in Brussels
- > Quick, simple and ready to test

Context

- > Brussels' **open data** initiative (<https://opendata.brussels.be>)
- > Methodology and templates ready to use



Source: <https://www.parcoursbd.brussels/en/fresques/froud-stouf/>

Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

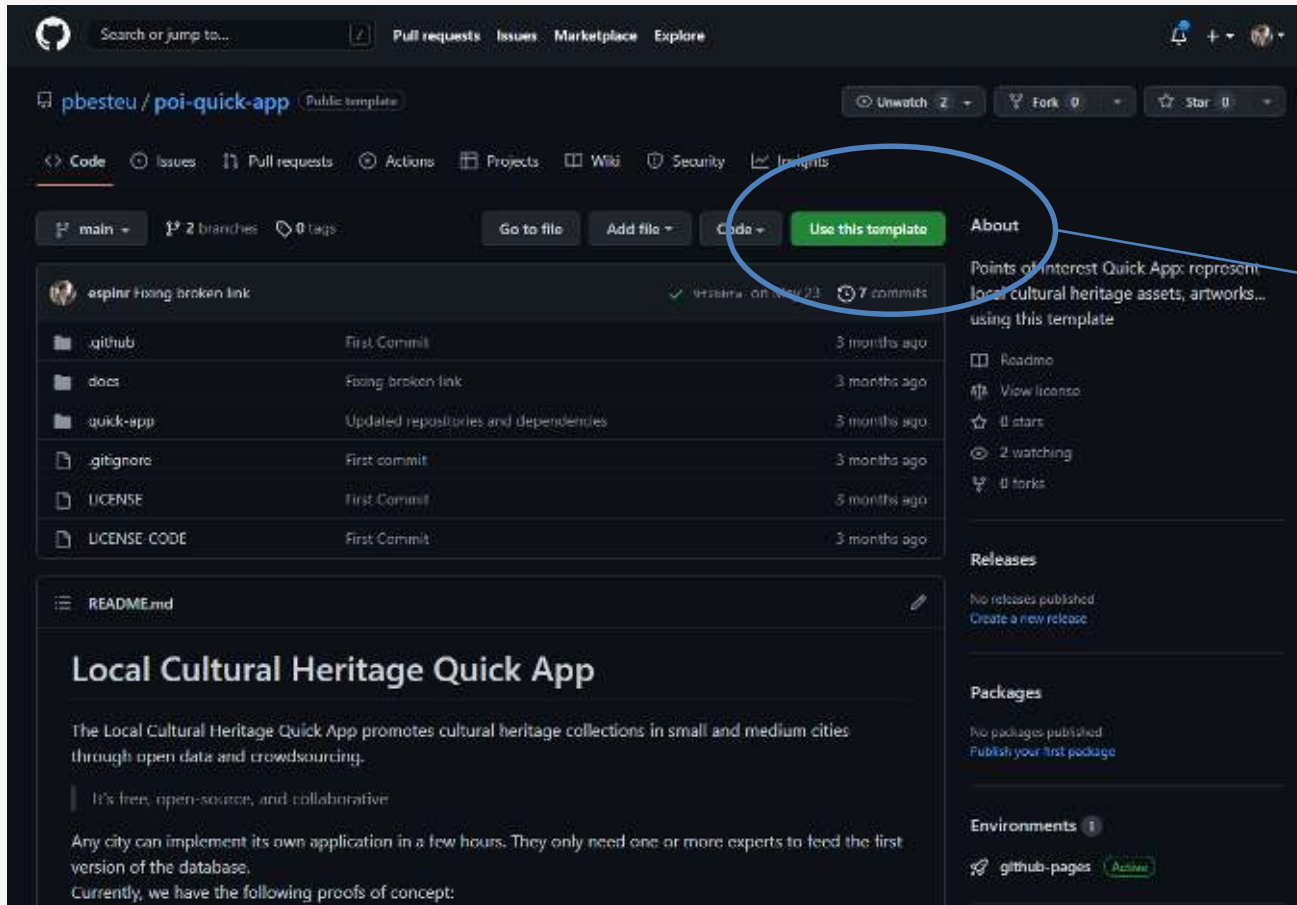
Step 4: upload content to GitHub

Step 5: configure the app

Step 6: run the app

Step-by-step example (an easy one)

Clone the **open source** project (basic *git* skills needed)



Search or jump to... Pull requests Issues Marketplace Explore

pbesteu / poi-quick-app Public template

Unwatch 2 Fork 0 Star 0

Code Issues Pull requests Actions Projects Wiki Security Insights

main 2 branches 0 tags

Go to file Add file Code Use this template

espinr fixing broken link 9 commits on Nov 23 7 commits

File	Commit	Time
.github	First Commit	3 months ago
docs	Fixing broken link	3 months ago
quick-app	Updated repositories and dependencies	3 months ago
.gitignore	First commit	3 months ago
LICENSE	First Commit	3 months ago
LICENSE CODE	First Commit	3 months ago

README.md

Local Cultural Heritage Quick App

The Local Cultural Heritage Quick App promotes cultural heritage collections in small and medium cities through open data and crowdsourcing.

It's free, open-source, and collaborative.

Any city can implement its own application in a few hours. They only need one or more experts to feed the first version of the database.

Currently, we have the following proofs of concept:

Releases: No releases published. Create a new release

Packages: No packages published. Publish your first package

Environments: github-pages Action

Create a new repository from local-cultural-heritage

The new repository will start with the same files and folders as [espinr/local-cultural-heritage](#).

Owner: espinr Repository name: comic-book-route ✓

Great repository names are short and memorable. Need inspiration? How about [congenial-broccoli?](#)

Description (optional): Quick App for the Brussels' Comic Book Route

☒ Public Anyone on the internet can see this repository. You choose who can commit.

☐ Private You choose who can see and commit to this repository.

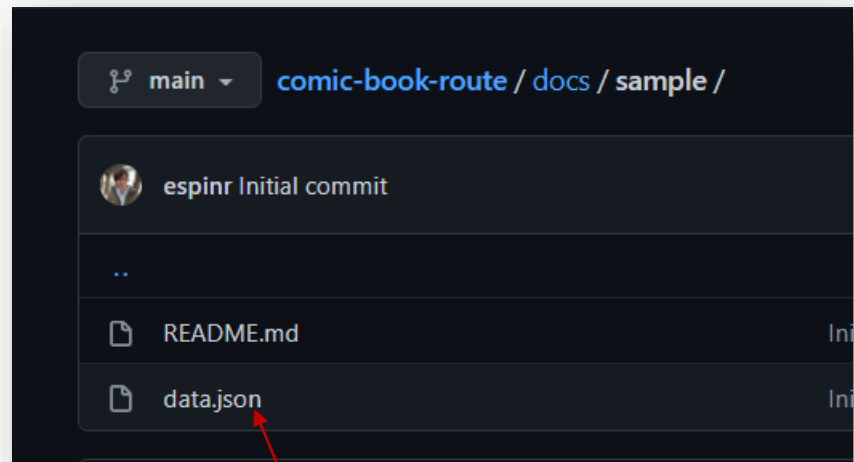
☐ Include all branches Copy all branches from espinr/local-cultural-heritage and not just main.

ⓘ You are creating a public repository in your personal account.

Create repository from template

Structure of **the repository**: the **database**

docs/ → the database



<https://github.com/pbesteu/comic-book-route-quick-app/tree/main/docs>



data.json

data.json → database open to anyone

We activate Github/Gitlab... publication

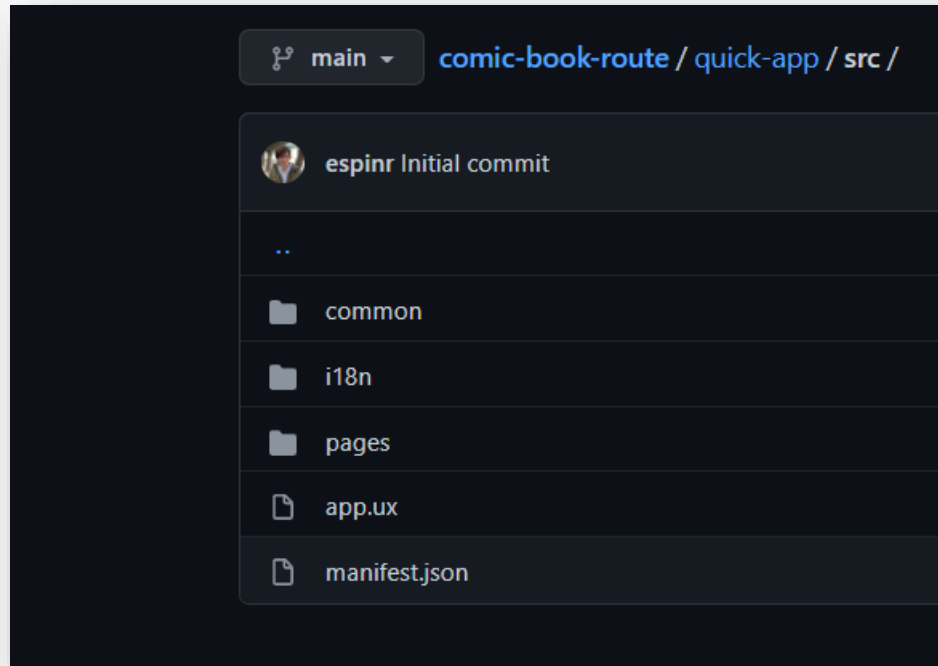
Automatic validation of the JSON format
once a new version is updated

The database is accessible from the web

<https://pbesteu.github.io/comic-book-route-quick-app/bxl/data.json>

Structure of **the repository**: the **quick app**

quick-app/ → the app code



<https://github.com/pbesteu/comic-book-route-quick-app/tree/main/quick-app>

Contains the code of a **quick app** (MiniApp for Android) ready to customize.

See [more details](#) about the code structure

Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

Step 4: upload content to GitHub

Step 5: configure the app

Step 6: run the app

Step-by-step example (an easy one)

Brussels Open Data provides a dataset

The screenshot shows the Brussels Open Data website interface. The top navigation bar includes links for Home, Explore, Cartograph, API, License, FAQ, News, Links, Suggestions, and Contact. The main content area displays the 'Comic book route' dataset. The sidebar on the left shows '64 records' and a search bar. The main content area includes a description of the dataset, its identifier, download count, themes, keywords, and license. The 'License' field is highlighted with a red box.

Dataset Identifier: comic-book-route

Downloads: 1,175

Themes: Culture, Heritage

Keywords: culture, tourisme, comic, strip

License: Licence Ouverte (Etalab)

Language: English

Modified: December 15, 2021 1:56 PM

Publisher: VisitBrussels

Reference: <http://www.brussels.be/5316>

Territory: Bruxelles

Last processing: December 15, 2021 1:56 PM (metadata)
December 15, 2021 1:56 PM (data)

DCAT

Created: February 24, 2012

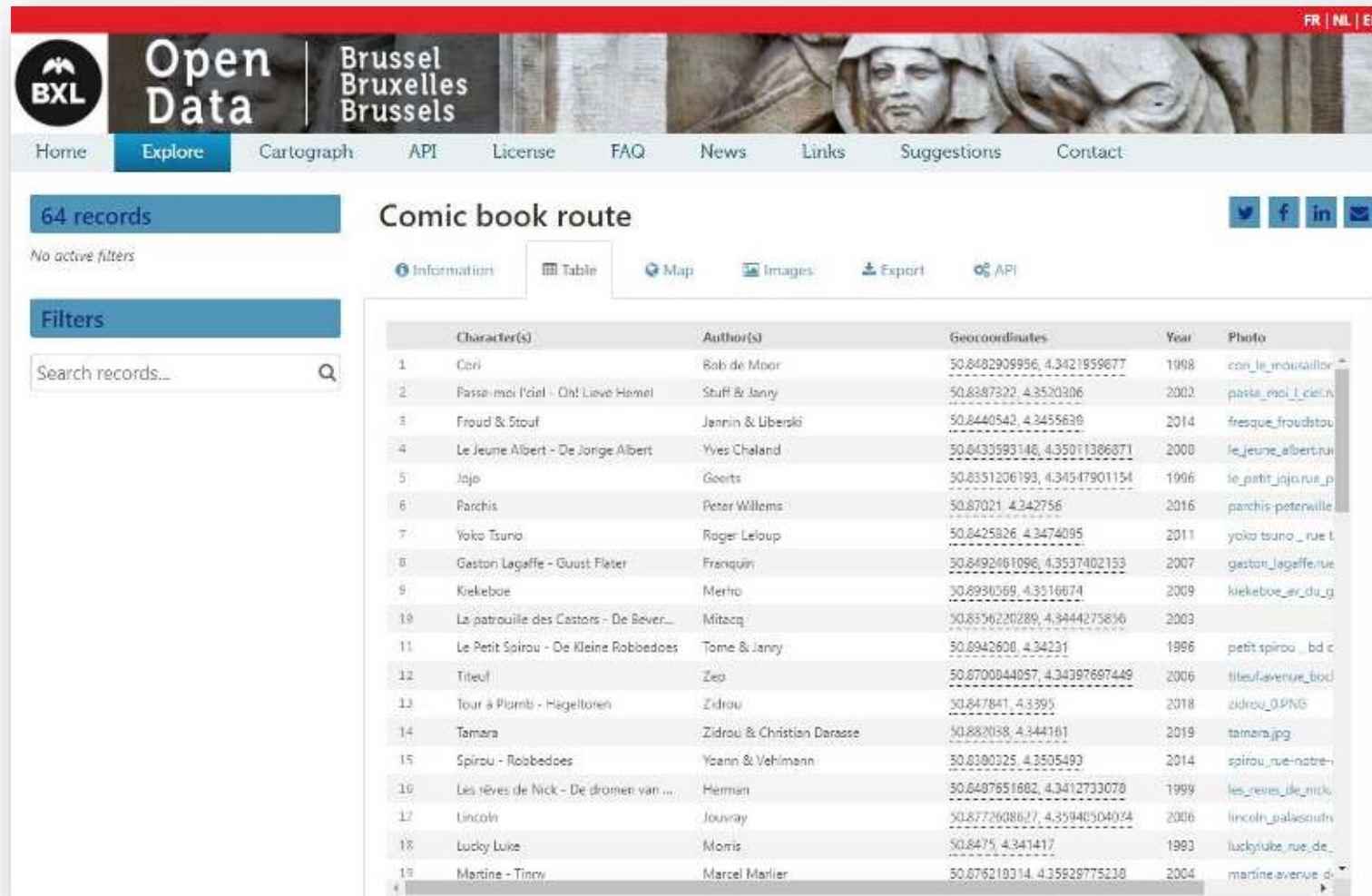
Issued: October 1, 2013

Spatial: City of Brussels

Dataset schema

<https://bruxellesdata.opendatasoft.com/explore/dataset/comic-book-route/table/>

... in open **format** (CSV), by the way 😊

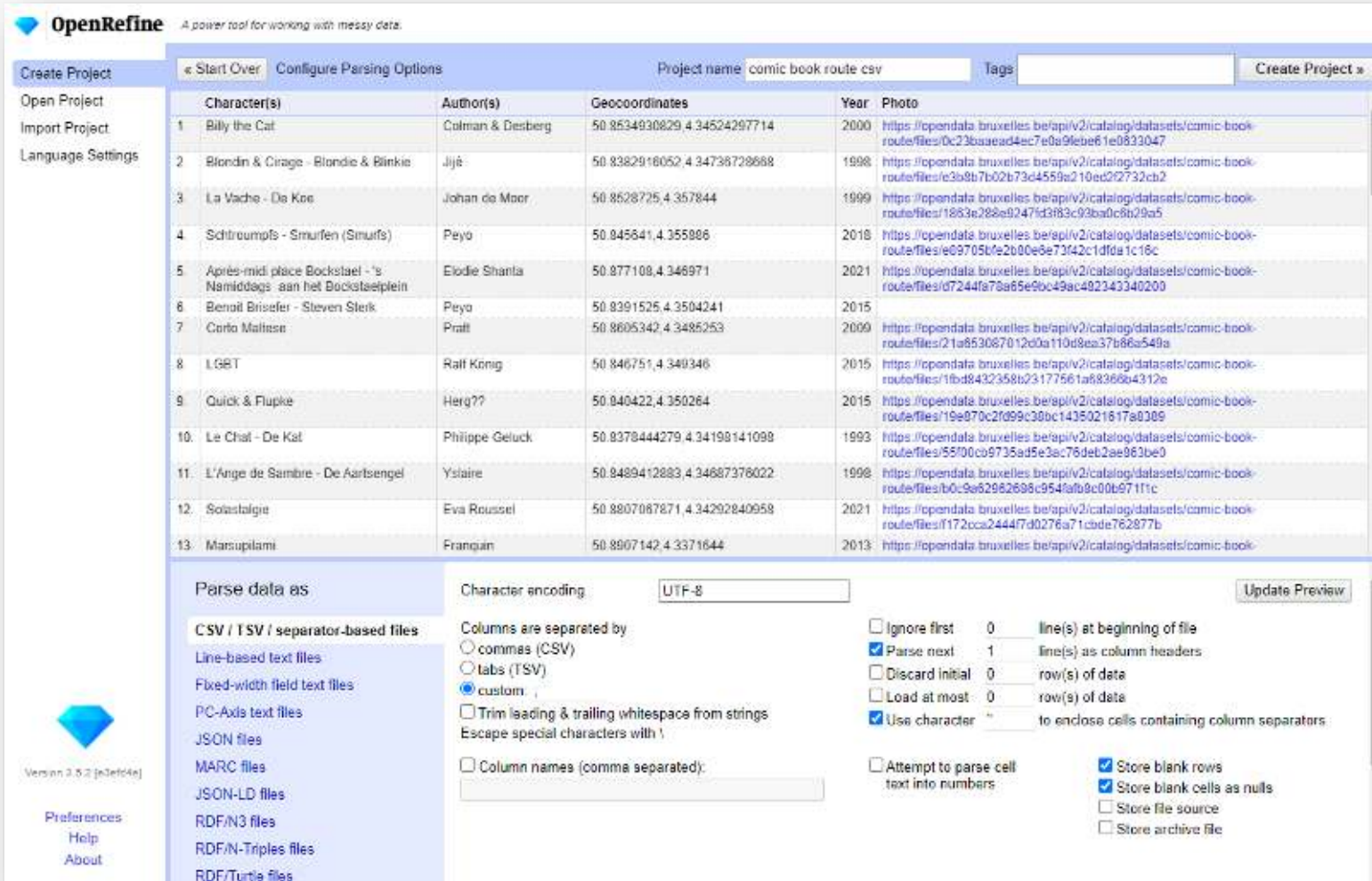


The screenshot shows the 'Open Data Brussels' website interface. The header includes the BXL logo, 'Open Data' and 'Bruxelles Brussels' text, and a navigation bar with links: Home, Explore, Cartograph, API, License, FAQ, News, Links, Suggestions, and Contact. The main content area is titled 'Comic book route' and shows '64 records' with 'No active filters'. A 'Filters' section on the left has a search bar. The data is displayed in a table with columns: Character(s), Author(s), Geocoordinates, Year, and Photo. The table lists 19 comic book routes, each with a unique identifier, author, location coordinates, year, and a photo link.

	Character(s)	Author(s)	Geocoordinates	Year	Photo
1	Ceri	Bob de Moor	50.8482909956, 4.3421959677	1998	ceri_le_moustailor
2	Passe-moi Poul - Oht Lieve Hemel	Stuff & Janny	50.8387322, 4.3520306	2002	passe_moi_l_ciel_n
3	Froud & Stouf	Jannin & Liberski	50.8440542, 4.3455639	2014	fresque_froudstou
4	Le Jeune Albert - De Jonge Albert	Yves Chaland	50.8433593148, 4.35011386871	2000	le_jeune_albert_rui
5	Jojo	Goerts	50.8351206193, 4.34547901154	1996	le_petit_jojo_rue_p
6	Parchis	Peter Willems	50.87021, 4.342756	2016	panchis-peterwille
7	Yoko Tsuno	Roger Leloup	50.8425826, 4.3474095	2011	yoko_tsuno_rue_t
8	Gaston Lagaffe - Guust Flater	Frankin	50.8492461096, 4.3537402153	2007	gaston_lagaffe_rue
9	Kiekeboe	Mertro	50.8936569, 4.3516674	2009	kiekeboe_av_du_g
10	La patrouille des Castors - De Bever...	Mitacq	50.8556220289, 4.3444275856	2003	
11	Le Petit Spirou - De Kleine Robbedoes	Tome & Janny	50.8942608, 4.34231	1996	petit_spirou_bd_c
12	Titeuf	Zep	50.8700844057, 4.34397697449	2006	titeufavenue_bou
13	Tour à Plomb - Hageltoeren	Zidrou	50.847841, 4.3395	2018	zidrou_0.PNG
14	Tamara	Zidrou & Christian Darasse	50.882038, 4.344161	2019	tamara.jpg
15	Spirou - Robbedoes	Yvanni & Vehlmann	50.8300325, 4.3505493	2014	spirou_rue-natre-
16	Les rêves de Nick - De dromen van ...	Herman	50.8407651682, 4.3412733078	1999	les_reves_de_nick
17	Lincoln	Journay	50.8772608627, 4.35946504034	2006	lincoln_palassouth
18	Lucky Luke	Moris	50.8475, 4.341417	1993	luckyluke_rue_de_
19	Martine - Tintin	Marcel Marlier	50.676219314, 4.35929775238	2004	martine_avenue_d

<https://bruxellesdata.opendatasoft.com/explore/dataset/comic-book-route/table/>

We need to refine the data



OpenRefine A power tool for working with messy data.

Create Project | « Start Over | Configure Parsing Options | Project name: comic book route csv | Tags: | Create Project »

Open Project | Import Project | Language Settings

	Character(s)	Author(s)	Geocoordinates	Year	Photo
1	Billy the Cat	Colman & Desberg	50.8534930829, 4.34524297714	2000	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/0c23baead4ec7e0a96be61e0833047
2	Blondin & Cirage - Blondie & Blinky	Jijé	50.8362916052, 4.34736728688	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e3b8b7b02b73c4559a210ed262732cb2
3	La Vache - Da Koe	Johan de Moor	50.8528725, 4.357844	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1883e288e9247d383c93ba0c6b29a5
4	Schtroumpfs - Smurfen (Smurfs)	Peyo	50.845641, 4.355886	2018	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e09705bfe2b00e8e73f42c1dfda1c16c
5	Après-midi place Bockstael - 's Namiddags aan het Bockstaetplein	Elodie Shanta	50.877108, 4.346971	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/d7244fa78a65e9bc49ac492343340200
6	Benoit Brissefer - Steven Sterk	Peyo	50.8391525, 4.3504241	2015	
7	Carlo Mattesi	Prati	50.8605342, 4.3485253	2009	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/21a853067012c0a110d8ea37b68a549a
8	LGBT	Ralf König	50.846751, 4.349346	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1bd8432358b23177561a88368b4312e
9	Quick & Flupke	Herg??	50.840422, 4.350264	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/19e87bc2f099c38bc1435021617a0309
10	Le Chat - De Kat	Philippe Geluck	50.8378444279, 4.34198141098	1993	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/55f00cb9735ad5e3ac76deb2ae963be0
11	L'Ange de Sambre - De Aartsengel	Ystaire	50.8489412883, 4.34687376022	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b0c9a52982698c954fab9c00b97111c
12	Solastalgie	Eva Roussel	50.8807087871, 4.34292840958	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/f172cca24447d0276a71cbde762877b
13	Marsupilami	Franquin	50.8907142, 4.3371644	2013	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/19e87bc2f099c38bc1435021617a0309

Parse data as

- CSV / TSV / separator-based files
- Line-based text files
- Fixed-width field text files
- PC-Axis text files
- JSON files
- MARC files
- JSON-LD files
- RDF/N3 files
- RDF/N-Triples files
- RDF/Turtle files

Character encoding: UTF-8

Columns are separated by:

- ☐ commas (CSV)
- ☐ tabs (TSV)
- ☒ custom: ,

☐ Trim leading & trailing whitespace from strings

Escape special characters with \

☐ Column names (comma separated):

☐ Ignore first 0 line(s) at beginning of file

☒ Parse next 1 line(s) as column headers

☐ Discard initial 0 row(s) of data

☐ Load at most 0 row(s) of data

☒ Use character " " to enclose cells containing column separators

☐ Attempt to parse cell text into numbers

☒ Store blank rows

☒ Store blank cells as nulls

☐ Store file source

☐ Store archive file

Update Preview

Version 3.8.2 [e3ef64e]

Preferences | Help | About

Adaptation to our templates

Using own scripts or Open Refine 😊

<https://openrefine.org>

High-quality dataset with 64 Points of Interest

OpenRefine

Comic Book Route BXL

Permalink

Open...

Export

Help

Facet / Filter

Undo / Redo

64 rows

Extensions: Wikidata

Refresh

Reset All

Remove All

X

Photo

change

2 choices Sort by: name count

false 61

true 3

Facet by choice counts

X

Geocoordinates

change

1 choice Sort by: name count

false 64

Facet by choice counts

X

Character(s)

change

1 choice Sort by: name count

false 64

Facet by choice counts

Show as: rows records

Show: 5 10 25 50 100 500 1000 rows

first

previous

1

of 1 page

next

last

	All	Character(s)	Author(s)	Geocoordinates	Year	Photo
1.	Billy the Cat	Colman & Desberg	50.0534930029;4.34524297714	2000	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/0c23bbae446c7e0a8f0e0e61e0633047	
2.	Blondin & Cragie - Blondie & Binkie	Jijé	50.0362916052;4.34736720668	1996	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e3b0b7b02b73d4559a210ed2732cb2	
3.	La Vache - De Koe	Johan de Moor	50.8528725;4.357844	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1063a288a92476d363c93ba008b20a5	
4.	Schtroumpfs - Smurfen (Smurfs)	Peyo	50.045641;4.355085	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e85705b1e2b0c0de73f42c1d0a1c16c	
5.	Après-midi place Boecklaere - 's Namiddags aan het Bloeksteelpien	Elodie Shanta	50.877108;4.346071	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/d7244fa78a85e9b049e0482343340200	
6.	Benoit Brisefer - Stevin Sterk	Peyo	50.8301525;4.3504241	2015		
7.	Corto Maltese	Pratt	50.0005342;4.3485253	2009	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/21a652067012d0a110d8ea37966a548a	
8.	LGBT	Ralf König	50.846751;4.349346	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/10b8432350b23177561a8366b4312a	
9.	Quick & Flupke	Hergé	50.040422;4.350264	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/15e670c2f099c38bc1435021617a8389	
10.	Le Chat - De Kat	Philippe Geluck	50.8378444279;4.34198141098	1993	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/55f00cb9735ad5e3ac76deb2ae863be0	
11.	L'Ange de Sombre - De Aartsengel	Ysaïre	50.0489412863;4.34607376022	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b0c0a82962886c954afb0c00b07111c	
12.	Solastalgie	Eva Roussel	50.0807067071;4.34292040950	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/f172cca2444f7d0276a710bde762077b	
13.	Marsupilami	Franquin	50.8907142;4.3371644	2013	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4d809486a3164c0e0e0d5a4a2a1d0	
14.	La Voie lactée	Mathilde Van Gheluwe	50.0394619195;4.34260158061	2019	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/106cb113cd88bb60405f77a4c136c73	
15.	Boule & Bill - Bolle & Bilie	Roba	50.8376411641;4.34558620909	1992	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4e84973dda8839c83b15edbe02671c7	
16.	Le roi des mouches	Mezzo	50.87640767;4.35762405396	2007	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b5c0ffaab02e82y4a9a63c1579632d32a	
17.	Blake & Mortimer	Jacobs	50.8388906;4.351568	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/5002670d0893671de0239f157ca227fa	
18.	Le monde renversé - De omgekeerde wereld	Alak	50.87708328811941;4.348827342290489	2021		
19.	Marline - Tinty	Marcel Marlier	50.876218314;4.35929775238	2004	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/920f29a147e577c70400d4f905254d31	
20.	Broussaille - Ragebol	Frank Pè	50.8467465143;4.34942722321	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b17daccb02082203540e3e0d12b51	
21.	Caroline Daldwin	Taymans & Wesel	50.0407390720;4.33095587921	2003	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/31ca0910ca8f0c08eb6845f01fca476	

3 with no picture

All had name,
and coordinates 👍

Data cleansing: split coordinate components

The image illustrates a data cleansing process in a software application. A dialog box titled "Split column Geocoordinates into several columns" is shown, overlaid on a data table. The dialog box has two main sections: "How to Split Column" and "After Splitting".

How to Split Column

- ☒ by separator
 - Separator: ☐ regular expression
 - Split into: columns at most (leave blank for no limit)
- ☐ by field lengths
 -
 - List of integers separated by commas, e.g., 5, 7, 15

After Splitting

- ☒ Guess cell type
- ☒ Remove this column

Buttons: OK, Cancel

Data Table (Before Splitting)

	Geocoordinates	Year
rg	50.8534930829,4.34524297714	2000
	50.8382916052,4.34736728668	1999
	50.8528725,4.357844	1999

Data Table (After Splitting)

	Geocoordinates 1	Geocoordinates 2	Year
	50.8534930829	4.34524297714	2000
	50.8382916052	4.34736728668	1999
	50.8528725	4.357844	1999
	50.845641	4.355886	2000

Data cleansing: split several authors

The image shows a data cleansing interface with a dialog box titled "Split column Author(s) 1 into several columns".

How to Split Column

- ☒ by separator
Separator: ☐ regular expression
Split into columns at most (leave blank for no limit)
- ☐ by field lengths

List of integers separated by commas, e.g., 5, 7, 15

After Splitting

- ☒ Guess cell type
- ☒ Remove this column

Buttons: OK, Cancel

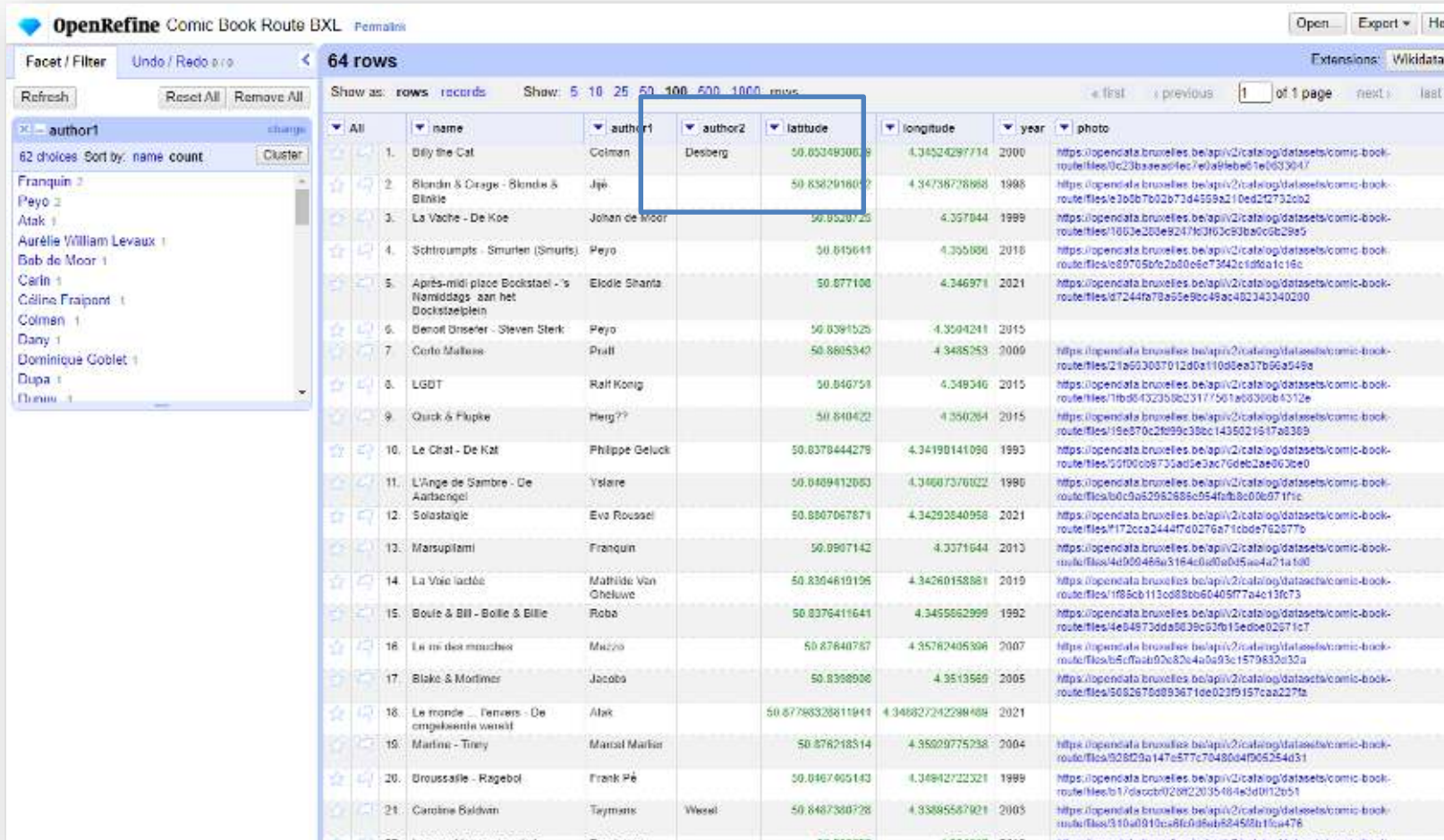
Before Splitting:

	Author(s)	lat
	Colman & Desberg	
linkie	Jijé	
	Johan de Moor	

After Splitting:

	Author(s) 1	Author(s) 2	
	Colman	Desberg	
e &	Jijé		
	Johan de Moor		
	Peyo		
le 'n	Elodie Shanta		

Original dataset properly formatted



OpenRefine Comic Book Route BXL

Facet / Filter Undo / Redo 64 rows Extensions: Wikidata

Refresh Reset All Remove All Show as: rows records Show: 5 10 25 50 100 500 1000 rows

author1 change 62 choices Sort by: name count Cluster

author1 author2 latitude longitude year photo

1.	Billy the Cat	Colman	Desberg	50.832493008	4.34524297714	2000	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/0c23bae5d1ec7e1a91eb61e0633047
2.	Blondin & Orange - Blondin & Blinky	Jijé		50.838291807	4.34738778888	1988	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e3b0b7b02b73d4559a210ed22732cb2
3.	La Vache - De Koe	Johan de Moor		50.9520725	4.357844	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1663e283e9247c3f03c83ba5c6c28e5
4.	Schtroumpfs - Smurten (Smurfs)	Peyo		50.845641	4.355886	2018	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/c897056fe2b80e6e73442c1d6a1c16c
5.	Après-midi place Bockstael - 's Namiddags aan het Bockstaelplein	Elodie Shanta		50.877100	4.346971	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/d7244fb78a55e96c49ac402343340200
6.	Benoit Brisefer - Steven Sterk	Peyo		50.8391525	4.3594211	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/21a603037012d0a110d5e37b56a549a
7.	Corio Mathias	Prull		50.8805340	4.3485253	2009	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/17b0d432359c23177501a60300b4312e
8.	LGDT	Ralf König		50.846751	4.349346	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/15e870c2699c38bc1436021617a8369
9.	Quack & Flupke	Hergé??		50.840422	4.350264	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/29100c0873ad5e3ac76de2ae0036e0
10.	Le Chat - De Kat	Philippe Geluck		50.8378444279	4.34190141090	1993	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b0c9a52962688c54fa7b8c00e0717c
11.	L'Ange de Sombre - De Aartsengel	Yslaire		50.8489412083	4.34607370022	1990	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4e04873dda9039c53f615ed0e02671c7
12.	Solastalgie	Evo Roussel		50.8807067871	4.34293840958	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/172cca2444f7d0276a71c0de762677b
13.	Marsupilami	Franquin		50.8907142	4.3371644	2013	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4d9d046a3164d8d0a5aa4a21a1d0
14.	La Voie lactée	Mathilde Van Gheluwe		50.8304619195	4.34260158881	2019	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1f85cb113c0838bb60405f74c13f73
15.	Boule & Bill - Boule & Billie	Roba		50.8376411641	4.3455662999	1992	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4e04873dda9039c53f615ed0e02671c7
16.	La mi des mouches	Mazzo		50.87840787	4.35782405306	2007	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b5cfaab02e82e4a0a93c1579832a32a
17.	Blake & Mortimer	Jacoba		50.8388908	4.3513569	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/5082670a893671ee023f9157caa227a
18.	Le monde - l'envers - De omgekeemde wereld	Atak		50.87788328811941	4.34882724298408	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/928d9a147e577c704804d065254d31
19.	Martini - Timy	Manuel Marlier		50.876218514	4.35029775738	2004	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b17d6c0b020923035484e3d012b51
20.	Broussaille - Ragebol	Frank Pé		50.8467405143	4.34942722321	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/310a0910ca86c0d8ab845458a15ca476
21.	Caroline Baldwin	Teymat	Weesl	50.8487380728	4.33885587921	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/310a0910ca86c0d8ab845458a15ca476

One author/column

Geo. coordinates

Minor editorial changes

Okay... but...

OpenRefine Comic Book Route BXL

Facet / Filter Undo / Redo 64 rows

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

author1

62 choices. Sort by: name count

Refresh Reset All Remove All

	name	author1	author2	latitude	longitude	year	photo
1.	Billy the Cat	Colman	Desberg	50.8524930028	4.34524297714	2000	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/0c23baaeadfec7e1a91eb61e0633047
2.	Blinkin & Orange - Blinkin & Blinky	Jipe		50.8507916052	4.34736778660	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e3b0b7b02b73d4d559a210ed227320b2
3.	La Vache - De Koe	Johan de Moor		50.9528725	4.357844	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1663e283e9247f03f03c83ba6c6c28e5
4.	Schtroumpfs - Smurten (Smurfs)	Peyo		50.845641	4.355880	2018	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e897056fe2b80e6e73442e1d6a1c16c
5.	Après-midi place Bockstael - 's Namiddags aan het Bockstaelplein	Elodie Shanta		50.877100	4.346971	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/d7244fb78a55e96c49ac402343340200
6.	Benoit Brisefer - Steven Sterk	Peyo		50.8391525	4.3594211	2015	
7.	Corio Mathias	Prall		50.8805340	4.3485253	2009	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/21a603037012d0a110d0e37b56a548a
8.	LGDT	Ralf König		50.846751	4.349346	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1fb0432359c23177501a60309b4312e
9.	Quack & Flupke	Herg??		50.840422	4.350264	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/15e870c2699c38bc1436021617a8369
10.	Le Chat - De Kat	Philippe Geluck		50.8378444279	4.34190141090	1993	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/20100c08733ad5e3ac76de2ae0036e0
11.	L'Ange de Sombre - De Aartsengel	Yslaire		50.8489412083	4.34607370022	1990	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b0c9a52962886c54fa7b8c00e071f1c
12.	Solastalgie	Eva Roussel		50.8807067871	4.34293840958	2021	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1172cca2444f7d0276a71cbde762677b
13.	Marsupilami	Franquin		50.8907142	4.3371644	2013	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4d9d0468a3164d8d0a05aa4a21a1d0
14.	La Voie lactée	Mathilde Van Gheleuve		50.8304619195	4.34260158881	2019	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1f85cb113c083bb60405f77a4c13fc73
15.	Boule & Bill - Bollie & Billie	Roba		50.8376411641	4.3455662999	1992	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4e84873dda9039c53fb15ed0e02671c7
16.	La mi des mouches	Muzio		50.87640787	4.35782405306	2007	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b5cf7a0b02b82e4a0a93c1579832a32a
17.	Blake & Mortimer	Jacobs		50.8388908	4.3513569	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/50826708893671ee023f9157ca5227a
18.	Le monde ... l'envers - De omgekeemde wereld	Atak		50.87788328811941	4.348827242298408	2021	
19.	Martini - Timy	Manuel Marlier		50.876218514	4.35029775738	2004	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/928d29a147e577c704804d065254d31
20.	Broussaille - Ragebol	Frank Pé		50.8467405143	4.34942722321	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b176ac0b020922035484e3d012b51
21.	Caroline Baldwin	Teymats	Weesl	50.8487388728	4.33885587921	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/310a010ca86c0d86b8458a15ca476
22.	Le monde tout au rebours	Frank Pé		50.87788328811941	4.348827242298408	2021	

Who is *Billy the Cat*?
...and *Colman*?
...and *Desberg*?



<https://www.parcoursbd.brussels/en/fresques/billy-the-cat/>

Looking for the semantics

Reconcile column "name" [Access Service API](#)

Reconcile each cell to an entity of one of these types:

- ☐ comic book series
Q14406742
- ☐ comic book album
Q2831984
- ☐ community
Q177634
- ☐ silent film
Q226730
- ☐ media franchise
Q196600
- ☐ gag cartoon
Q3543088
- ☐ version, edition, or translation
Q3331189
- ☐ social movement
Q49773
- ☐ magazine

☐ Reconcile against type:

☒ Reconcile against no particular type

☒ Auto-match candidates with high confidence

Maximum number of candidates to return

Also use relevant details from other columns:

Column	Include?	As Property
author1	<input checked="" type="checkbox"/>	<input type="text"/>
author2	<input checked="" type="checkbox"/>	<input type="text"/>
latitude	<input type="checkbox"/>	<input type="text"/>
longitude	<input type="checkbox"/>	<input type="text"/>
year	<input type="checkbox"/>	<input type="text"/>
photo	<input type="checkbox"/>	<input type="text"/>

[Add Standard Service...](#) [Start Reconciling...](#) [Cancel](#)

Reconciliation of
painting title to
external semantic
entities (Wikidata)

We could use official
(trusted) endpoints

30" later, we have semantics in our spreadsheet

The image shows the OpenRefine interface with a dataset titled "Comic Book Route BXL". The main table has columns: name, author1, author2, latitude, longitude, year, and photo. The first row is "Billy the Cat" by Colman and Desberg, published in 2000. A list of 64 rows is shown, with a "name" facet on the left. The "name" facet shows a list of choices, including "Billy the Cat (100)", "histoires courtes de Billy the Cat (74)", "Le Choix de Billy (100)", "Billy Boss (52)", "Cat City (40)", "L'Œil du maître (41)", "Saucisse le terribile (34)", "La Chaméleon (32)", "Dans la peau d'un chat (29)", "L'Éto du secret (28)", "Les Machines à ronronner (27)", "La vie amoureuse de Sophie Arnold (26)", "Le Destin de Pimlin (25)", "A Classification of forest habitat types of the Lincoln National Forest, New Mexico (25)", "Monsieur papa (23)", "A crustacean annotated transcriptome (CAT) database (23)", "The sequence to hydrogenate coronene cations: A journey guided by magic numbers (22)", "Systemic cat scratch disease: hepatic and splenic involvement about 3 pediatric cases (21)", "Integration of Multiple Platforms for the Analysis of Multifluorescent Marking Technology Applied to Pediatric GBM and DIPG (18)", "Water, shape recognition, salt bridges, and cation- π interactions differentiate peptide recognition of the HIV rev-responsive element (15)", and "A simplified protein precipitation/mixed-mode cation-exchange solid phase extraction, followed by high-speed liquid chromatography/mass spectrometry (15)".

A Wikidata window is open, showing the "Billy the Cat" entity. The Wikidata page displays the entity's name in French/Belgian, English, Spanish, Catalan, and Dutch. It also shows a table of statements, including "instance of" and "has part".

The Wikidata window is titled "Billy the Cat (Q863286)". It shows the entity's name in various languages and a table of statements. The table has columns for Language, Label, and Description. The statements are listed below the table.

Language	Label	Description
English	Billy the Cat	French/Belgian animated series
Spanish	no label defined	serie de televisión
Catalan	no label defined	no description defined
Dutch	no label defined	televisieserie uit Canada

The statements section shows "instance of" with a value of "animated series".

We can reconcile by a specific type

Reconcile column "name"

Access Service API

Reconcile each cell to an entity of one of these types:

☒ comic book series
Q14406742

☐ comic book album
Q2831984

☐ community
Q177634

☐ silent film
Q226730

☐ media franchise
Q196600

☐ gag cartoon
Q3543088

☐ version, edition, or translation
Q3331189

☐ social movement
Q49773

☐ magazine

☐ Reconcile against type:

☐ Reconcile against no particular type

☒ Auto-match candidates with high confidence

Maximum number of candidates to return

Also use relevant details from other columns:

Column	Include?	As Property
author1	<input type="checkbox"/>	
author2	<input type="checkbox"/>	
latitude	<input type="checkbox"/>	
longitude	<input type="checkbox"/>	
year	<input type="checkbox"/>	
photo	<input type="checkbox"/>	

Add Standard Service...

Start Reconciling... Cancel

We are just focused on comic books, so we'll be accurate.

Some perfect, and close matches

The screenshot displays the OpenRefine interface for a dataset titled "Comic Book Route BXL". The main table shows 59 matching rows (64 total). The left sidebar contains facet filters for "author1", "name: judgment", and "name: best candidate's score". The "author1" facet shows 57 choices, including "Franguin", "Payo", "Atak", "Aurélien William Levaux", "Bob de Moor", "Carlin", "Céline Fralpoint", "Colman", "Dany", "Dominique Goblet", "Dupas", and "Duvoux". The "name: judgment" facet shows 2 choices: "matched" (29) and "none" (39). The "name: best candidate's score" facet shows a range from 59 to 101, with "Numeric" and "Blank" options selected. The main table lists rows with columns: name, author1, author2, latitude, longitude, year, and photo. Row 2, "Blondin & Cirage - Blondie & Blinky", is highlighted. A match dialog is open, showing a list of matches for the selected cell. The dialog includes a "Match this Cell" button, a "Match All Identical Cells" button, and a "Cancel" button. The matches list includes "Blondin et Cirage (71)", "Blondin et Cirage en Amérique (61)", "Blondin et Cirage au Mexique (52)", "Les Nouvelles Aventures de Blondin et Cirage (50)", "Le Nègre blanc (45)", "Blondin et Cirage contre les gangsters (44)", and "Create new item".

OpenRefine Comic Book Route BXL

Facet / Filter Undo / Redo 11 / 11

59 matching rows (64 total)

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

Extensions: Wikidata

author1

57 choices Sort by: name count Cluster

Franguin 2

Payo 2

Atak 1

Aurélien William Levaux 1

Bob de Moor 1

Carlin 1

Céline Fralpoint 1

Colman 1

Dany 1

Dominique Goblet 1

Dupas 1

Duvoux 1

name: judgment

2 choices Sort by: name count

matched 29

none 39

Facet by choice counts

name: best candidate's score

59 — 101

Numeric Non-numeric Blank

Error

name: judgment

2 choices Sort by: name count

matched 29

none 39

	name	author1	author2	latitude	longitude	year	photo
1.	Billy the Cat	Colman	Desberg	50.8534930829	4.34524297714	2000	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/0c23baaad4ec7a0a0f8be81e0633047
2.	Blondin & Cirage - Blondie & Blinky	Jijé		50.8382916052	4.34736728668	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e3b507b02b73d4559a210ed2d732eb2
3.	La Vache - De Koe	Johan de Moor					
4.	Schtroumpfs - Smurfs (Smurfs)	Payo					
5.	Après-midi place Bockstael - 's Namiddags aan het Bockstaelplein	Elodie Shanta					

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

	name	author1	author2	latitude	longitude	year
1.	Billy the Cat	Colman	Desberg	50.8534930829	4.34524297714	2000
2.	Blondin & Cirage - Blondie & Blinky	Jijé		50.8382916052	4.34736728668	1998
3.	La Vache - De Koe	Johan de Moor		50.8528725	4.357844	1999

Match this Cell Match All Identical Cells Cancel

Blondin et Cirage (Q611537)

comic book series

Finally, 48 matches

OpenRefine Comic Book Route BXL Permalink

Facet / Filter Undo / Redo 38 / 38 48 matching rows (64 total) Extensions Wikidata

Refresh Reset All Remove All Show as: rows records Show: 5 10 25 50 100 500 1000 rows 1 of 1 page

author1 change 48 choices Sort by: name count Cluster

author1 choices: Franquin 2, Peyo 2, Bob de Moor 1, Carin 1, C  line Fraipont 1, Colman 1, Dany 1, Dupa 1, Dupuy 1, Fran  ois Walth  ry 1, Frank P   1, Goorts 1

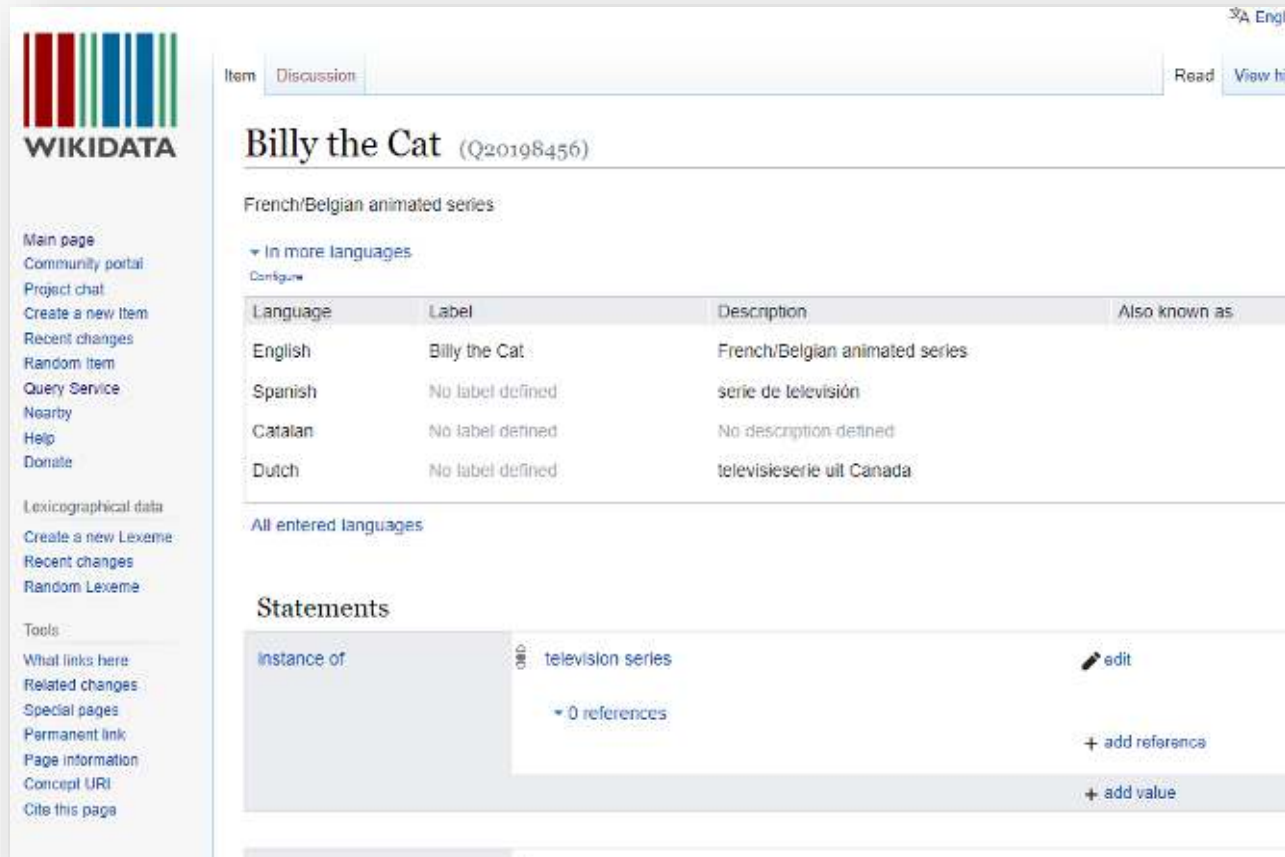
name: judgment change invert reset 2 choices Sort by: name count exclude

name: judgment choices: matched 48, new 10

Facet by choice counts

		name	original-name	author1	author2	latitude	longitude	year	photo
1		Billy the Cat	Billy the Cat	Colman	Desberg	50.8534930829	4.34524297714	2000	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/0c23b0e0ad4ec7e0a90f0e8e81e0633047
2		Blondin et Cirage	Blondin & Cirage - Blondie & Binkie	Jij��		50.8382916052	4.34738726868	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e3b0b7b02b73d4559a210ed22732cb2
3		La Vache	La Vache - De Koe	Johan de Moor		50.8528725	4.357844	1998	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1063e290e9247fd3f63c93ba0c0029a5
4		The Smurfs	Schtroumpfs - Smurfen (Smurfs)	Peyo		50.845541	4.355886	2018	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/e09705afe2b00e6e73f42c1dffa1c16c
6		Beno��t Br��seler	Beno��t Br��seler - Steven Slerk	Peyo		50.8391525	4.3504241	2015	
7		Corto Maltese	Corto Maltese	Prati		50.0805342	4.3485253	2009	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/21a65007012d0a110d0ea37b66a549a
8		LGBT community	LGBT	Ralf K��nig		50.846751	4.349346	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1fbd8432358b23177561a88366b4312c
9		Quirk & Flupke	Quirk & Flupke	Herg��?		50.840422	4.350264	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/19a870c26f99c38bc1435021a17a8309
10		Le Chat	Le Chat - De Kat	Philippe Geluck		50.8370444279	4.34189141090	1993	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/55f00cb9735ad5e3ac70deb2ae033be0
13		Marsupilami	Marsupilami	Franquin		50.8907142	4.3371644	2013	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4d000486a3164c0f0e0d5a4a21a1d0
15		Roule et Bill	Roule & Bill - Bolle & Bille	Roba		50.8378411641	4.3455862900	1992	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/4e84973d0a8839c03b15e0be02671c7
17		Blake and Mortimer	Blake & Mortimer	Jacobs		50.8390908	4.3519588	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/5082675d093671de023f9157caa227fe
20		Broussaille	Broussaille - Ragebol	Frank P��		50.8467465143	4.34942722321	1999	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/b17dac0b026f02035484e3d9f12b51
21		Caroline Balmain	Caroline Balmain	Taymans	Wesal	50.8487380728	4.3389587021	2003	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/310a0910ca8f0d0d6b6045f011ca476
24		L��onard	L��onard	Turk	De Groot	50.8381135	4.3460826	2015	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/1a2f0b57f0f0bd573ae2e2b7016945f
25		Odilon Verjus	Odilon Verjus - Govert Suisb��ier	Verron	Yann	50.8386439237	4.34633731842	2004	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/fd0b8a8709b0ace70c476a0bca8518a0
26		Thorgal	Thorgal	Gezregor Rosinski	Jean Van Hamme	50.8436175268	4.34400606575	2013	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/761fbc34110c8ee3d0c577a7151eb9af
28		Petit Pou	Petit Pou - Stoppeltje	C��line Fraipont	Pierre Bailly	50.8929872241	4.42356806456	2020	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/9f7af2d4541c532cb7ecde3602f4022c
30		Le Scorpion	Le Scorpion - De Schorpioen	Mar��ni		50.8477626282	4.3621301651	2002	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/911d3d085d018edc2900ff719e3e755
31		Ast��rix	Ast��rix & Ob��lix	Geocinny	Uderzo	50.8464078054	4.34238764906	2005	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/8040027054a00a861c477f4003c14f4
32		Gaston	Gaston Lagaffe - Guust	Franquin		50.8492461098	4.3537402153	2007	https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files/8040027054a00a861c477f4003c14f4

We are speaking in terms of Linked Data (for almost humans)



The screenshot shows the Wikidata page for 'Billy the Cat' (Q20198456). The page is in English and displays the item's label in various languages, its description, and its instance of 'television series'.

Language	Label	Description	Also known as
English	Billy the Cat	French/Belgian animated series	
Spanish	No label defined	serie de televisión	
Catalan	No label defined	No description defined	
Dutch	No label defined	televisieserie uit Canada	

Statements

Property	Value	References
instance of	television series	0 references

<https://www.wikidata.org/wiki/Q863286>

wd:Q863286 a wikibase:Item .

```
<https://fr.wikipedia.org/wiki/Billy_the_Cat> a schema:Article ;
  schema:about wd:Q863286 ;
  schema:inLanguage "fr" ;
  schema:isPartOf <https://fr.wikipedia.org/> ;
  schema:name "Billy the Cat"@fr .
```

```
<https://fr.wikipedia.org/> wikibase:wikiGroup "wikipedia" .
```

```
<https://nl.wikipedia.org/wiki/Billy_the_Cat> a schema:Article ;
  schema:about wd:Q863286 ;
  schema:inLanguage "nl" ;
  schema:isPartOf <https://nl.wikipedia.org/> ;
  schema:name "Billy the Cat"@nl .
```

```
<https://nl.wikipedia.org/> wikibase:wikiGroup "wikipedia" .
```

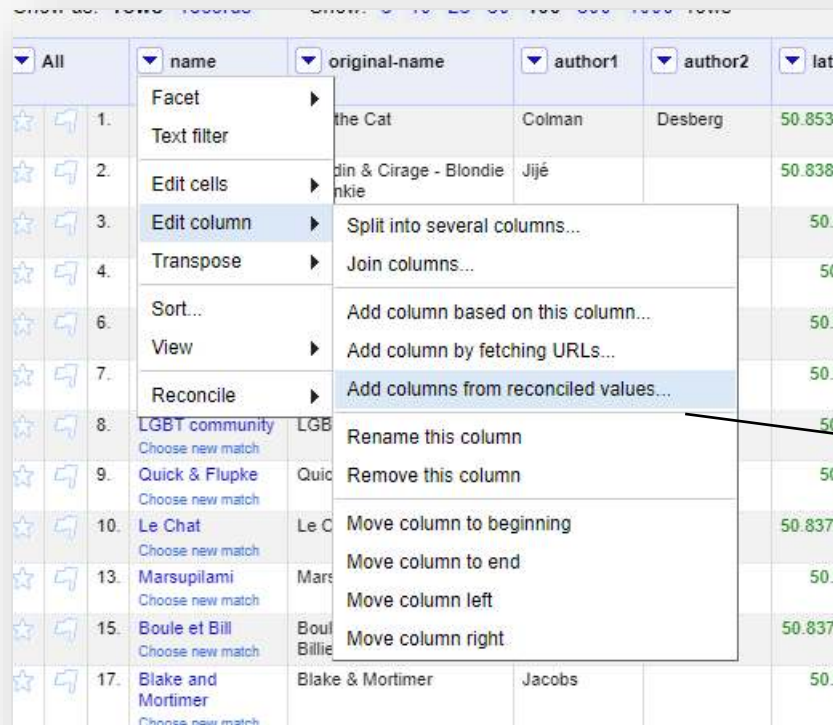
```
<https://id.wikipedia.org/wiki/Billy_the_Cat> a schema:Article ;
  schema:about wd:Q863286 ;
  schema:inLanguage "id" ;
  schema:isPartOf <https://id.wikipedia.org/> ;
  schema:name "Billy the Cat"@id .
```

```
<https://id.wikipedia.org/> wikibase:wikiGroup "wikipedia" .
```

```
<https://de.wikipedia.org/wiki/Billy_the_Cat> a schema:Article ;
  schema:about wd:Q863286 ;
  schema:inLanguage "de" ;
  schema:isPartOf <https://de.wikipedia.org/> ;
  schema:name "Billy the Cat"@de .
```

<https://www.wikidata.org/wiki/Special:EntityData/Q863286.ttl>

Enrich the dataset with more information (thanks, KGs 😊)



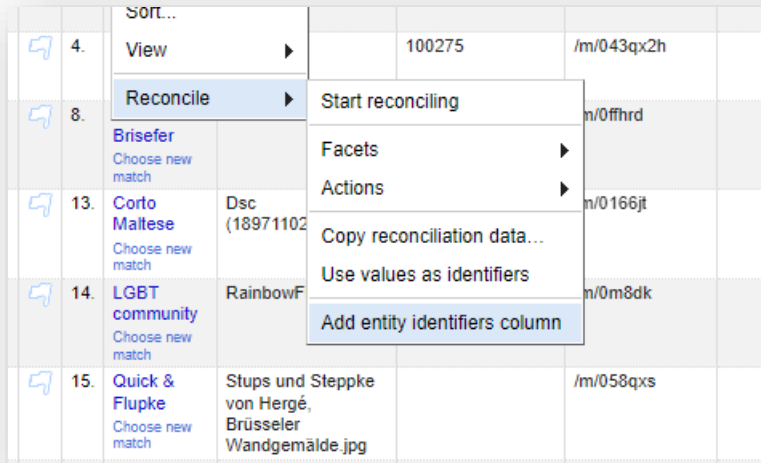
	name	original-name	author1	author2	lati
1.	the Cat		Colman	Desberg	50.8534
2.	Blondin & Cirage - Blondie & Blinkie		Jijé		50.8382
3.					50.8
4.					50
6.					50.8
7.					50.8
8.	LGBT community	LGB			50
9.	Quick & Flupke	Quic			50
10.	Le Chat	Le C			50.8378
13.	Marsupilami	Mars			50.8
15.	Boule et Bill	Boul			50.8378
17.	Blake and Mortimer	Blake & Mortimer	Jacobs		50.8

48 matching rows (81 total)

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

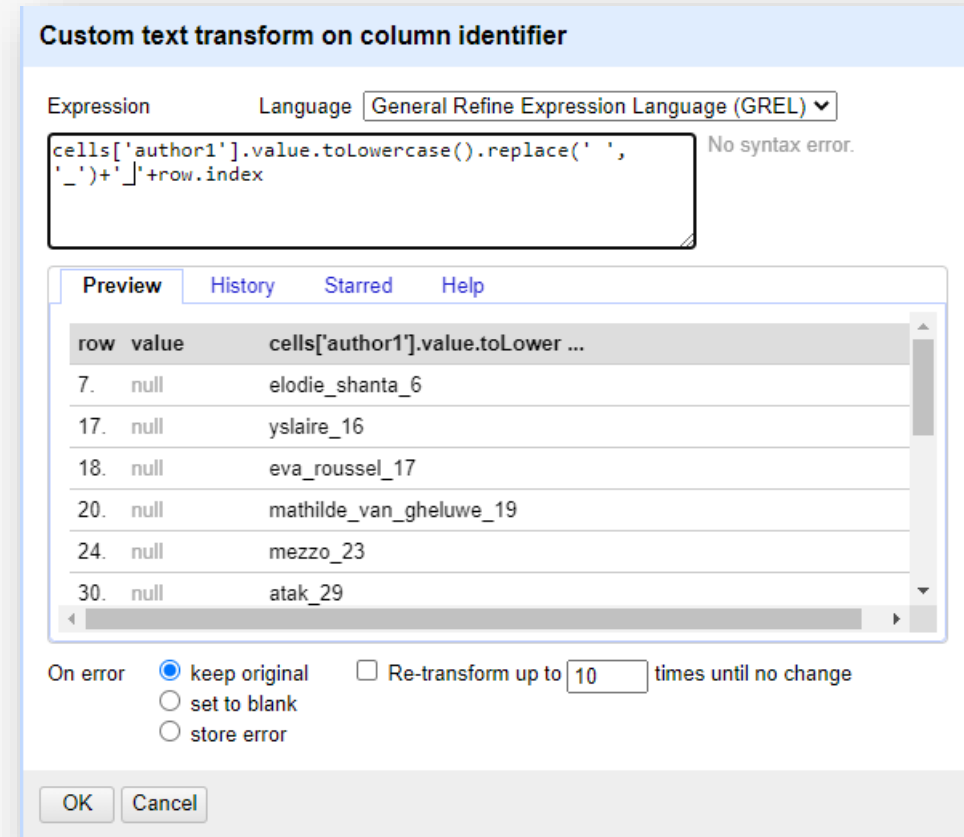
	name	image	GCD series ID	Freebase ID	French Vikidia ID	original-name	
1.	Billy the Cat		9582	/m/079ch0	Billy_the_Cat	Billy the Cat	Colr
2.	Blondin et Cirage	Blondin en Blinkie.JPG				Blondin & Cirage - Blondie & Blinkie	Jijé
3.	La Vache					La Vache - De Koe	Joh
4.	The Smurfs		100275	/m/043qx2h		Schtroumpfs - Smurfen (Smurfs)	Pey
8.	Benoît Brisefer	Steven Sterk.jpg	72680	/m/0ffhrd		Benoit Brisefer - Steven Sterk	Pey
13.	Corto Maltese	Dsc (189711025).jpeg		/m/0166jt		Corto Maltese	Prat
14.	LGBT community	RainbowFlagEdit.jpg		/m/0m8dk		LGBT	Ralf
15.	Quick & Flupke	Stups und Steppke von Hergé, Brüsseler Wandgemälde.jpg		/m/058qxs		Quick & Flupke	Hergé
16.	Le Chat			/m/09krc4		Le Chat - De Kat	Philippe Gel

Polish the dataset: unique identifiers for each row



		Sort...			
4.		View		100275	/m/043qx2h
8.		Reconcile			m/0ffhrd
		Brisefer			
		Choose new match			
13.		Corto Maltese	Dsc (18971102		m/0166jt
		Choose new match			
14.		LGBT community	RainbowF		m/0m8dk
		Choose new match			
15.		Quick & Flupke	Stups und Steppke von Hergé, Brüsseler Wandgemälde.jpg		/m/058qxs
		Choose new match			

Based on Wikidata IDs



Custom text transform on column identifier

Expression Language General Refine Expression Language (GREL) ▾

`cells['author1'].value.toLowerCase().replace(' ', '_')+']'+row.index` No syntax error.

Preview History Starred Help

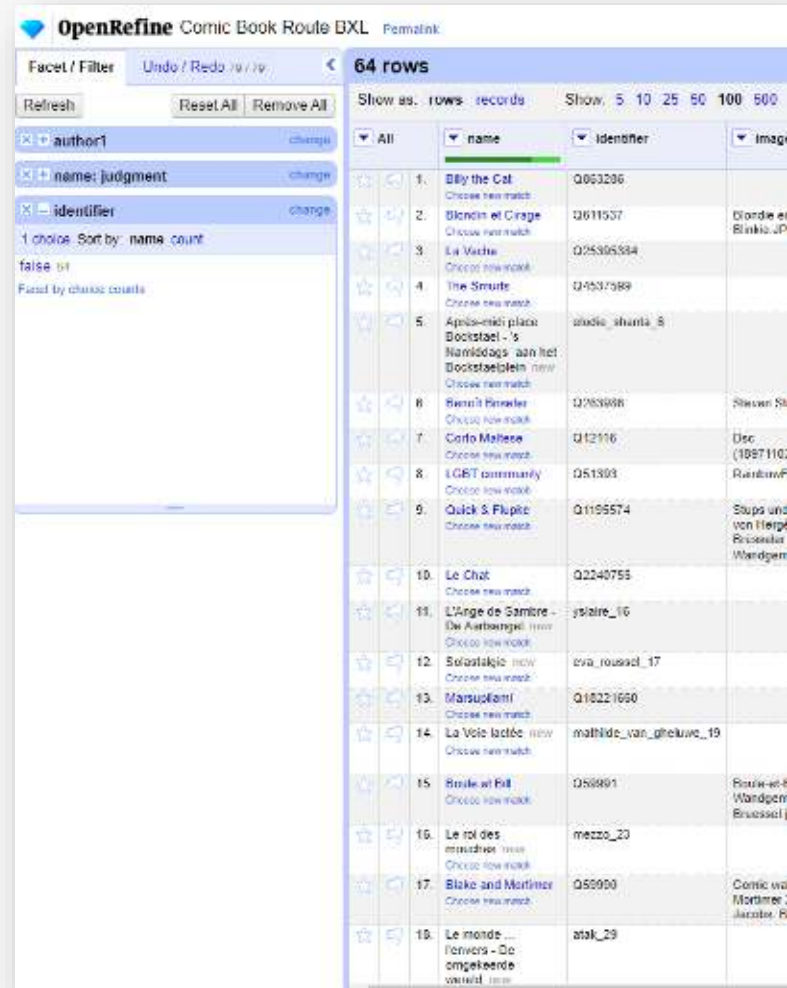
row	value	cells['author1'].value.toLower ...
7.	null	elodie_shanta_6
17.	null	yslaire_16
18.	null	eva_rousseau_17
20.	null	mathilde_van_gheluwe_19
24.	null	mezzo_23
30.	null	atak_29

On error ☒ keep original ☐ set to blank ☐ store error ☐ Re-transform up to times until no change

OK Cancel

For the rest we create it,
based on author's name

Double check there are no duplicates



OpenRefine Comic Book Route DXL Pematik

Facet / Filter Undo / Redo (u / r)

64 rows

Show as: rows records Show: 5 10 25 50 100 500

Refresh Reset All Remove All

author1 change

name: judgment change

identifier change

1 choice Sort by: name count

false 14

Facet by choice counts

		name	identifier	Image
1.	Billy the Cat	Q053206		
2.	Blondin et Grage	Q611537		Blondin et Grage JP
3.	La Machine	Q25305384		
4.	The Smurfs	Q4537589		
5.	Appel-midi place Boekstoel - 's Namiddags aan het Boekstoelplein	stodie_shuntla_8		
6.	Renoir's Renard	Q283988		Renoir's Renard
7.	Corto Maltese	Q12116		Dec (1987) 1102
8.	LGBT community	Q51308		RainbowF
9.	Quick & Flupke	Q1105574		Soups and von Herge Renardus Wandgem
10.	Le Chat	Q2240755		
11.	L'Ange de Gamorre - De Aarbengel	yslaire_16		
12.	Solostakio	eva_rousac_17		
13.	Marsuolami	Q10221690		
14.	La Voie lactée	mathilde_van_ghelewa_19		
15.	Roulet et Fil	Q58891		Roulet et Fil Wandgem Brussel j
16.	Le roi des masques	mezzo_23		
17.	Blake and Mortimer	Q50900		Comic van Mortimer J Jacobse R
18.	Le monde ...	atol_28		

We use facets

Data ready to be exported to our templates

OpenRefine Comic Book Route BXL Faceted Open Export Help

Facet / Filter Undo / Redo 79 / 79 64 rows Show as: rows records Show: 5 10 25 50 100 500 1000 rows Extensions: Wikidata

Refresh Reset All Remove All

author1 change

name: judgment change

identifier change

1 choice Sort by: name count

false ☐

Facet by choice counts

		name	identifier	image	OGD series ID	Freebase ID	French Wikidata ID	original name	author	author2	latitude	longitude	year	photo
★	1	Billy the Cat	Q663086		9582	/m/079xh0	Billy_the_Cat	Billy the Cat	Gennep	Desberg	50.6534900029	4.34524297734	2000	https://openbook-route.fr/
★	2	Biondi et Ciroge	Q611537	Biondi et Ciroge.JPG				Biondi et Ciroge - Biondi et Ciroge	Ajt		50.6362516052	4.34756728698	1998	https://openbook-route.fr/
★	3	La Voile	Q2596594					La Voile - De Kae	Johas de Moor		50.8528725	4.357844	1999	https://openbook-route.fr/
★	4	The Smurf	Q4537599		100275	/m/043p2h		Schtroumpf - Smurfen (Smurfs)	Peyo		50.645041	4.355095	2018	https://openbook-route.fr/
★	5	Après-midi place Bookstael - 5	elodie_shanta_8					Après-midi place Bookstael - 5	Elodie Shanta		50.677108	4.348971	2021	https://openbook-route.fr/
★	6	Bonnet Brueker	Q263886	Steven Stek.jpg	72666	/m/0ffru		Bonnet Brueker - Steven Stek	Peyo		50.6391525	4.3504241	2015	
★	7	Corto Maltese	Q12116	Dsc (195711025).jpg		/m/0169jt		Corto Maltese	Pratt		50.6605342	4.3465253	2008	https://openbook-route.fr/
★	8	LOST community	Q61369	RainbowFlagEst.jpg		/m/0n68tk		LOST	Raf Kibeg		50.646751	4.349148	2015	https://openbook-route.fr/
★	9	Quick & Flupke	Q1195574	Staps und Steppke von Hergl		/m/069qqs		Quick & Flupke	Heig??		50.649422	4.350254	2015	https://openbook-route.fr/
★	10	Le Chat	Q2246755			/m/08zn14		Le Chat - De Kat	Philippe Geluck		50.6378444279	4.34188141098	1993	https://openbook-route.fr/
★	11	L'ange de Sambre - De Aartengel	Yolke_18					L'ange de Sambre - De Aartengel	Volaine		50.6488412883	4.34887376922	1998	https://openbook-route.fr/
★	12	Solentalgia	wra_roumel_17					Solentalgia	Eva Roessel		50.8807067871	4.34282640958	2021	https://openbook-route.fr/
★	13	Mansuplani	Q18221660					Mansuplani	Frangon		50.6807142	4.3371844	2013	https://openbook-route.fr/
★	14	La Vie raibée	matthijs_van_gheluwe_19					La Vie raibée	Matthijs Van Gheluwe		50.6384619195	4.34260158881	2019	https://openbook-route.fr/
★	15	Boule et Bill	Q56081	Boule-et-Bill - Wandgenantele in Brussel.jpg	25160	/m/0d8b_	Boule_et_Bill	Boule & Bill - Boule & Bill	Robe		50.0375411841	4.3455862089	1992	https://openbook-route.fr/
★	16	Le roi des mouches	m0228_23					Le roi des mouches	Mezzo		50.6764787	4.35762405399	2007	https://openbook-route.fr/
★	17	Blake and Mortimer	Q59660	Comic wall Blake & Mortimer 2, Edgar P. Jacobs Brussels.jpg	47645	/m/03y48	Blake_et_Mortimer	Blake & Mortimer	Jacobs		50.8308968	4.3513509	2005	https://openbook-route.fr/
★	18	Le monde ramiers - De ongekende wereld	atak_29					Le monde ramiers - De ongekende wereld	Atak		50.67798323811941	4.348827242259489	2021	

And we have **the database of Pols**

The screenshot shows the 'Export' menu in OpenRefine. The menu is open, displaying various export options. The 'Templating...' option is highlighted with a blue background. The background of the screenshot shows a portion of the OpenRefine interface, including a table with columns 'author2' and 'latitude', and a sidebar with a 'data' dropdown and a 'last' button.

author2	latitude
erg	50.85
	50.83
	50
	5
	5
	50
	50
	5
	50.840422
	4.350264
	2015

- OpenRefine project archive to file
- Tab-separated value
- Comma-separated value
- HTML table
- Excel (.xls)
- Excel 2007+ (.xlsx)
- ODF spreadsheet
- Custom tabular exporter...
- SQL Exporter...
- Templating...**
- OpenRefine project archive to Google Drive...
- Google Sheets
- Wikibase edits...
- QuickStatements file
- Wikibase schema

Templating Export

Prefix

```
{
  "pois" : [
```

Row Template

```
{
  "id" : {{jsonize(cells["identifiant"].value)}},
  "name" : {{jsonize(cells["original-name"].value)}},
  "description" : {{jsonize("Comic by " + cells["author"]
    "lat" : {{jsonize(cells["latitude"].value)}},
    "lon" : {{jsonize(cells["longitude"].value)}},
    "images" : [{{if(cells["photo"].value!=null, jsonize
      "urls" : [ {{if(cells["GCD series ID"].value!=null,
        "freebase" : {{jsonize(cells["Freebase ID"].value)}}
        "wikimedia" : {{jsonize(cells["identifiant"].value)}}
      }
    }
  }
}
```

Row Separator

```
,
```

Suffix

```
]
}
```

Export

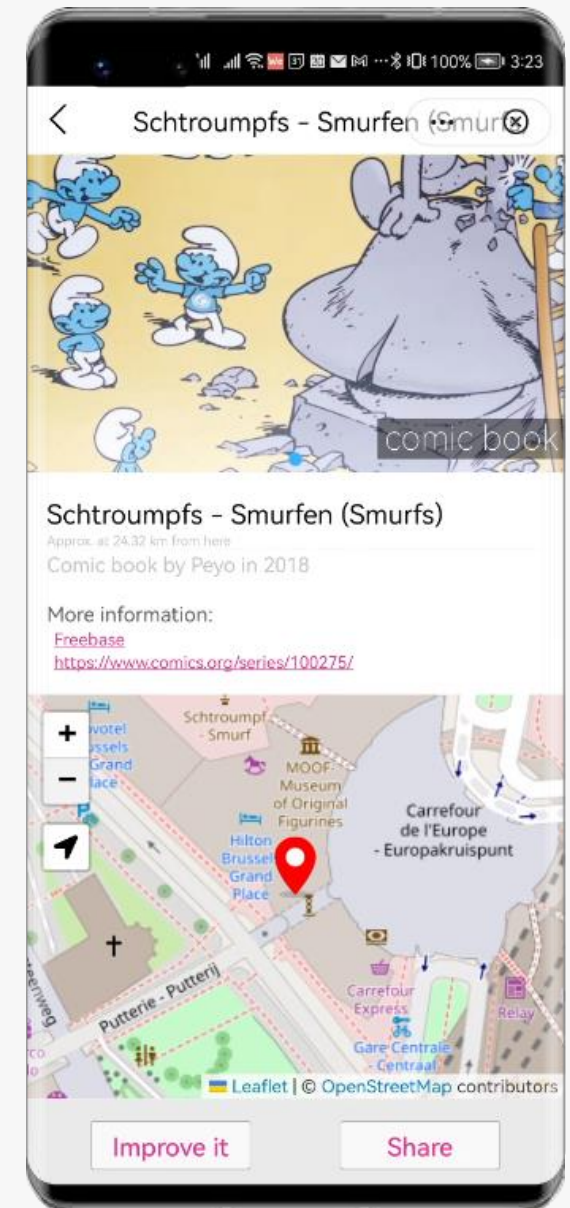
Cancel



Details of a Point of Interest (by default)

```
{
  "id" : "Q863286",
  "name" : "Billy the Cat",
  "description" : "Comic book by Colman and Desberg in 2000",
  "lat" : 50.8534930829,
  "lon" : 4.34524297714,
  "images" : [
    "https://opendata.bruxelles.be/...",
    "https://pbesteu.github.io/comics/bxl/images/001.jpg"],
  "type" : "comic book",
  "urls" : [ "https://www.comics.org/series/9582/" ],
  "freebase" : "/m/079ch0",
  "wikimedia" : "Q863286"
}
```

Anyone can **upload images to docs/** folder in the repository (they will be public) and link them from the data.json file.



Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

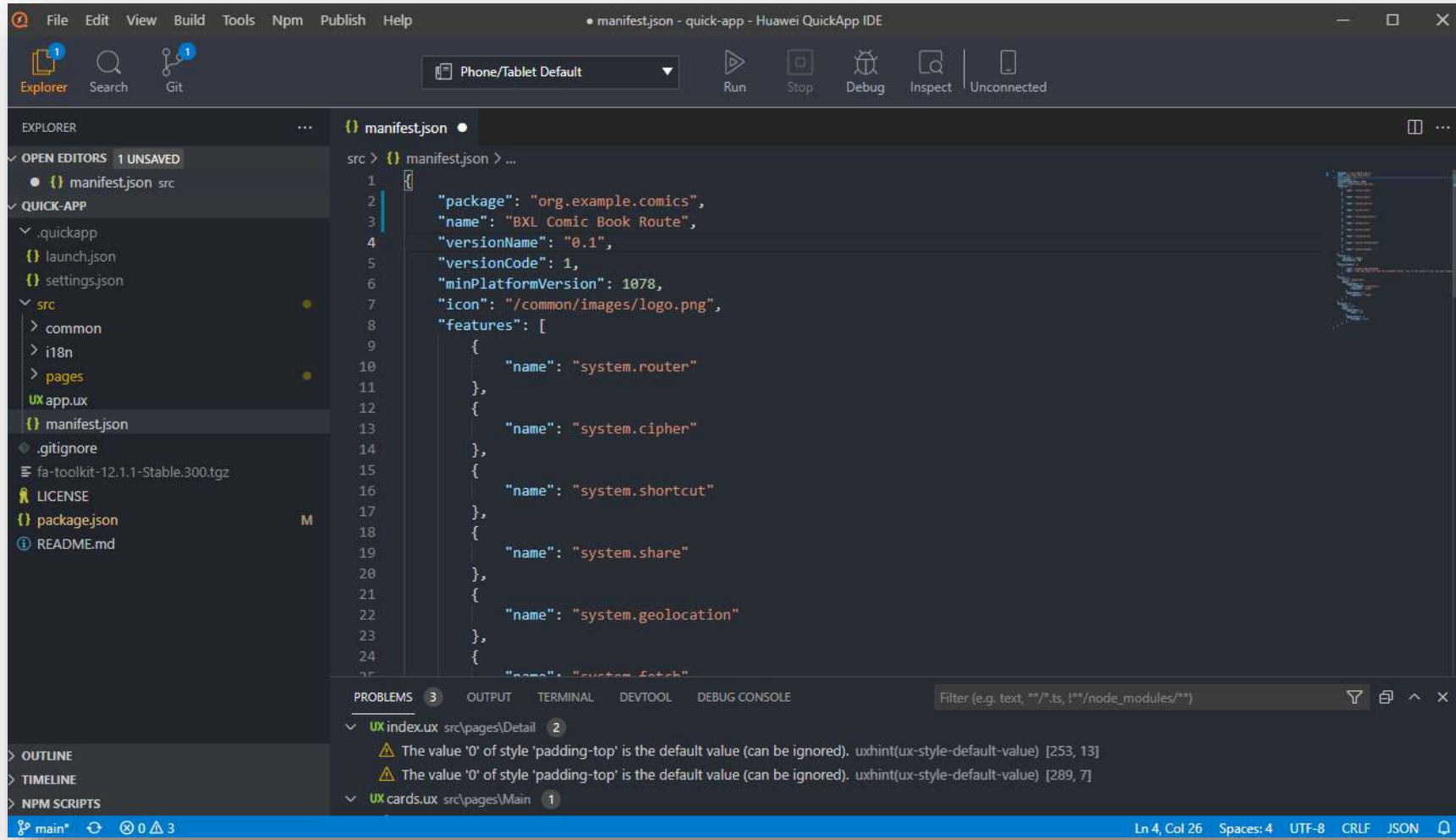
Step 4: upload content to GitHub

Step 5: configure the app

Step 6: run the app

Step-by-step example (an easy one)

Load the project ([quick-app/src/](#)) in your favorite editor



1. <https://developer.huawei.com/consumer/en/quickApp-ide>
2. <https://www.quickapp.cn/docCenter/IDEPublicity>

manifest.json: choose a name for your app

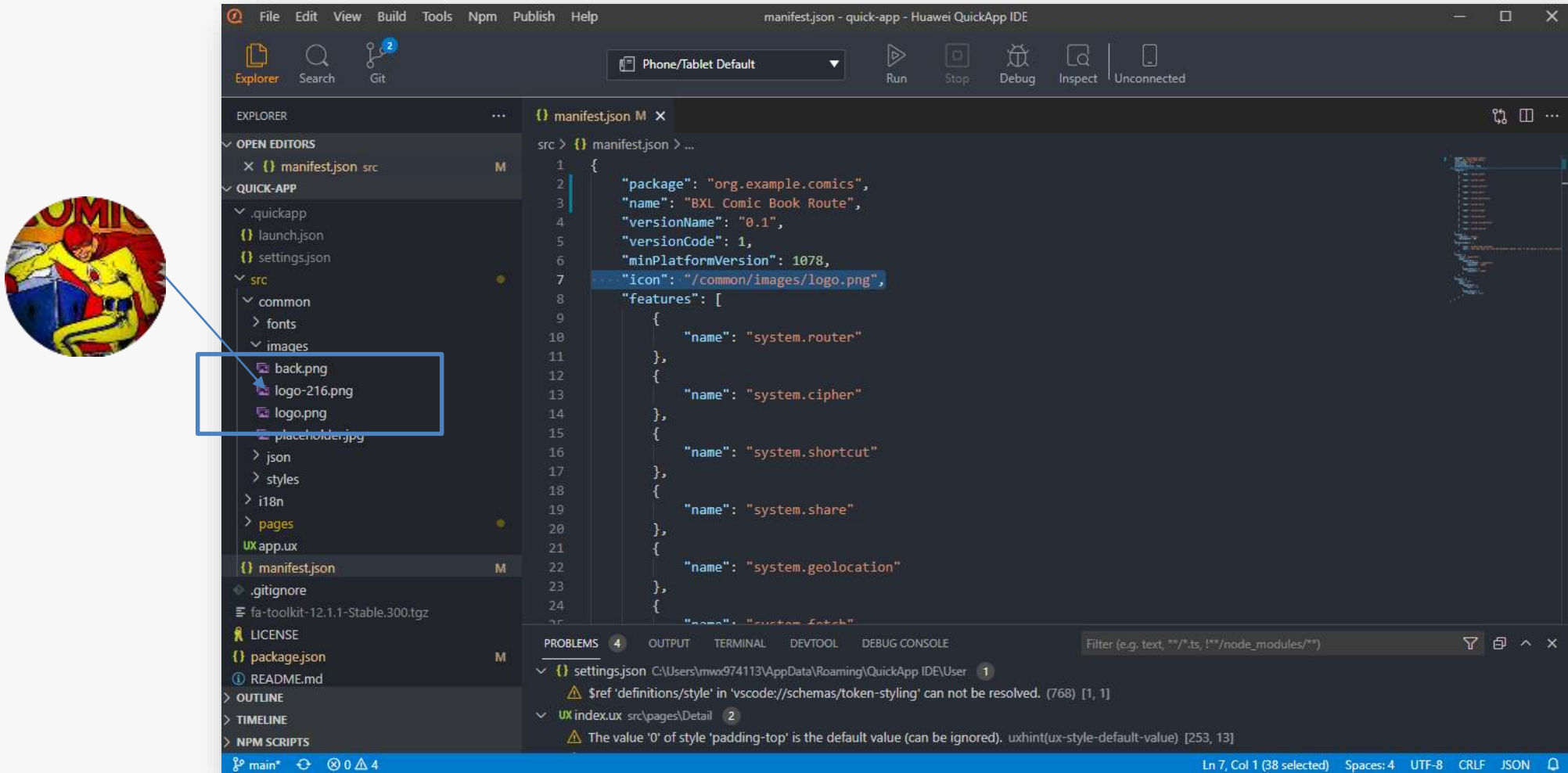


manifest.json

The screenshot shows the Huawei QuickApp IDE interface. The Explorer view on the left displays the project structure, including the 'src' directory and the 'manifest.json' file. The Editor view on the right shows the content of 'manifest.json', which is a JSON object defining app metadata. The 'name' property is highlighted in blue, indicating it is the current focus for editing.

```
src > {} manifest.json > ...
1  {
2    "package": "org.example.comics",
3    "name": "BXL Comic Book Route",
4    "versionName": "0.1",
5    "versionCode": 1,
6    "minPlatformVersion": 1078,
7    "icon": "/common/images/logo.png",
8    "features": [
9      {
10       "name": "system.router"
11     },
12     {
13       "name": "system.cipher"
14     },
15     {
16       "name": "system.shortcut"
17     },
18   ]
19 }
```

Rewrite the app main logo and the icon



<https://en.wikipedia.org/wiki/Comics#/media/File:WonderworldComics3.jpg>

data.json: customize app with descriptions and URLs

```
1 {
2   "meta": {
3     "app_title": "BXL Comic Book Route",
4     "version": 1,
5     "updated": "2022-05-12",
6     "source_url": "https://espinr.github.io/comic-book-route/sample/data.json",
7     "matomo_base_url": "https://matomo.pbest.me/matomo.php?idsite=1&rec=1",
8     "marketplace_url": ""
9   },
10  "content": {
11    "en": {
12      "app": {
13        "theme": {
14          "brand": "#e93890",
15          "complementary": "#ffffff"
16        },
17        "repository_url": "https://github.com/espinr/comic-book-route/",
18        "text_info": "This app is created by locals and experts. As you can see, it's also free of charge.",
19        "text_acknowledge": "This quick app is an open-source project powered by Brussels Open Data and the City of Brussels.",
20        "text_feedback": "Please let us know if you want to contribute with your experience, enrich the app.",
21        "feedback_url": "https://espinr.github.io/comic-book-route/sample/#get-involved",
22        "issue_url": "https://github.com/espinr/comic-book-route/issues/new?template=update_request.md"
23      }
24    },
25    "pois": [
26      {
27        "name": "Comic Book Route",
28        "description": "A route through the city of Brussels, following the comic book characters.",
29        "url": "https://espinr.github.io/comic-book-route/sample/data.json"
30      }
31    ]
32  }
33 }
```

Public URL of the data.json in the repository.

Initially, both data.json (local database of the app and in the repository) have the same content.

Paste the **Pols database** we generated

The screenshot shows the Huawei QuickApp IDE with the `data.json` file open. The file contains a JSON array of comic book data. A `Templating Export` dialog is open, showing a preview of the JSON structure. A red icon labeled **JSON data.json** is also visible.

```
{
  "code": 1,
  "pois": [
    {
      "id": "Q863286",
      "name": "Billy the Cat",
      "description": "Comic book by Colman and Desberg in 2000",
      "lat": 50.8534930829,
      "lon": 4.34524297714,
      "images": [
        "https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files"
      ],
      "type": "comic book",
      "urls": [
        "https://www.comics.org/series/9582/"
      ],
      "freebase": "/m/079ch0",
      "wikimedia": "Q863286"
    },
    {
      "id": "Q611537",
      "name": "Blondin & Cirage - Blondie & Blinky",
      "description": "Comic book by Jijé in 1998",
      "lat": 50.8382916052,
      "lon": 4.34736728668,
      "images": [
        "https://opendata.bruxelles.be/api/v2/catalog/datasets/comic-book-route/files"
      ],
      "type": "comic book",
      "urls": [
        "https://www.comics.org/series/9582/"
      ],
      "freebase": "/m/079ch0",
      "wikimedia": "Q863286"
    }
  ]
}
```

Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

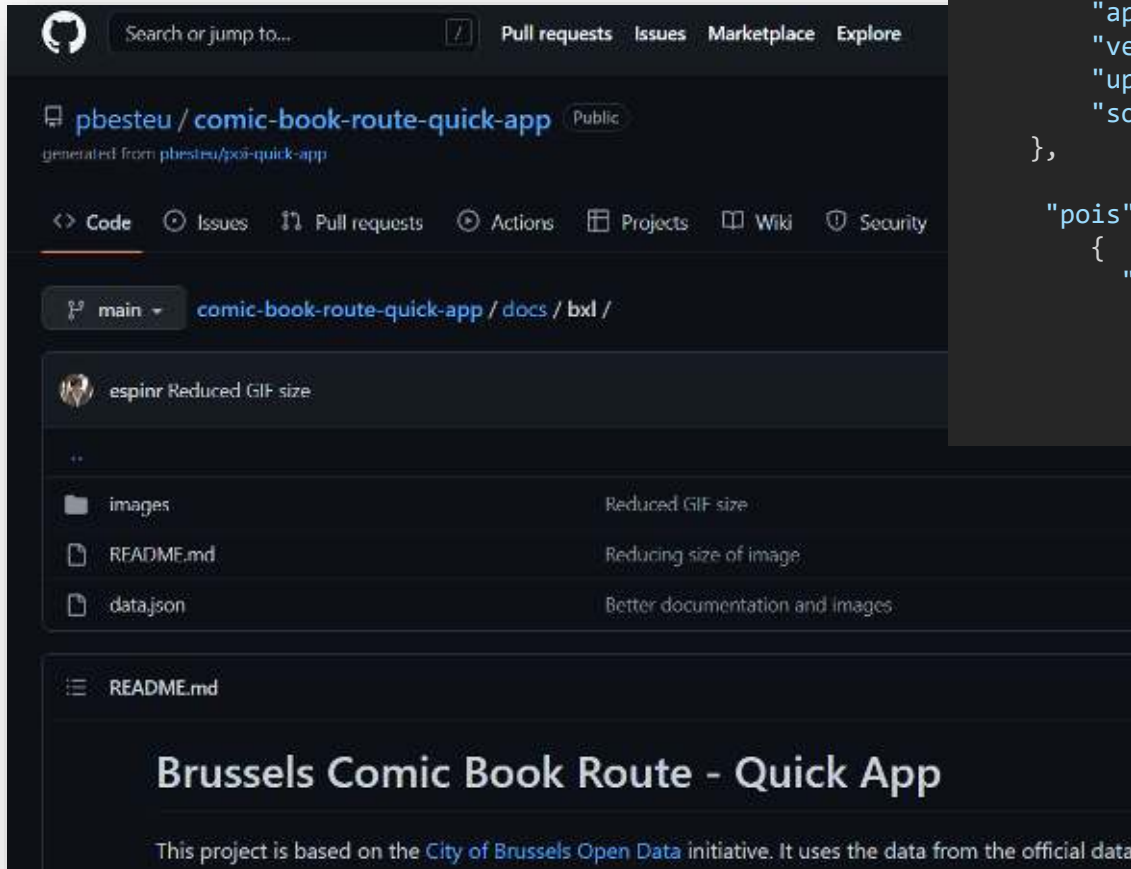
Step 4: upload content to GitHub

Step 5: configure the app

Step 6: run the app

Step-by-step example (an easy one)

How to update the database



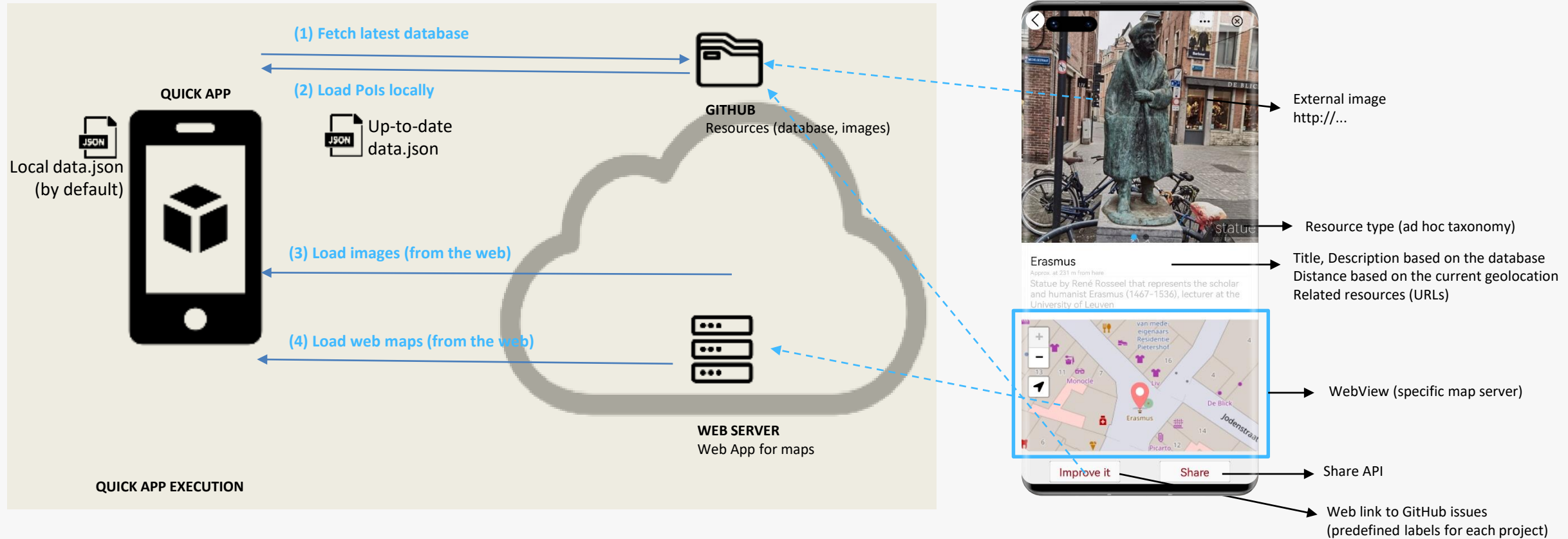
```
"meta": {
  "app_title": "BXL Comic Book Route",
  "version": 1,
  "updated": "2022-05-12",
  "source_url": "https://pbesteu.github.io/comic-book-route/blx/data.json",
},

"pois": [
  {
    "id" : "Q863286",
    "name" : "Billy the Cat",
    "description" : "Comic book by Colman and Desberg in 2000",
    "lat" : 50.8534930829,
```

Update the **data.json** in the repository

Increase the version number

Project components and app execution



Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

Step 4: upload content to GitHub

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Step 6: run the app

Step-by-step example (an easy one)

Internationalization: adapted to user's locale

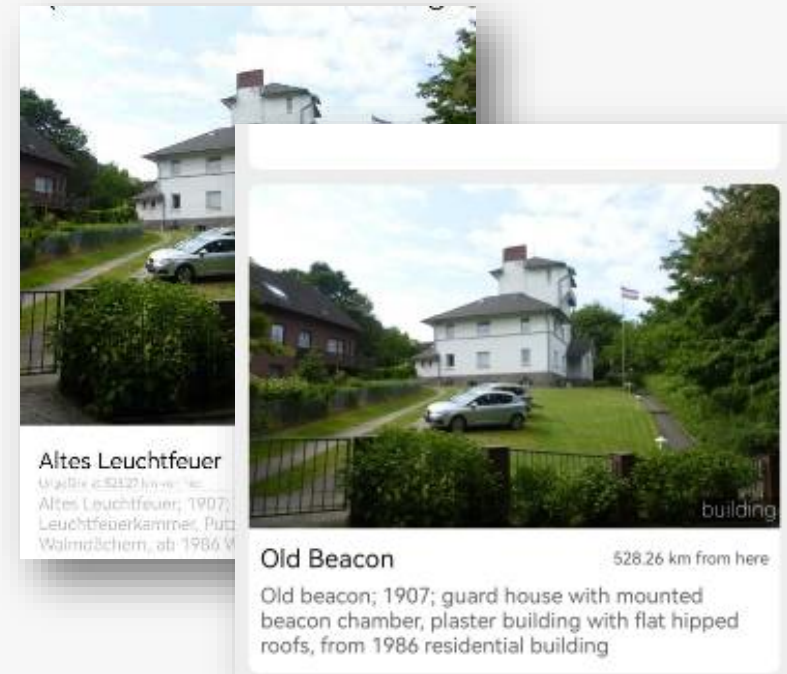
USER INTERFACE

User interface (UI) in different languages.
The community may help translate the UI (10' per language)



CONTENT (Pols database)

Content can be in different languages
For instance: German and English below



See [more details](#) about the setup

Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

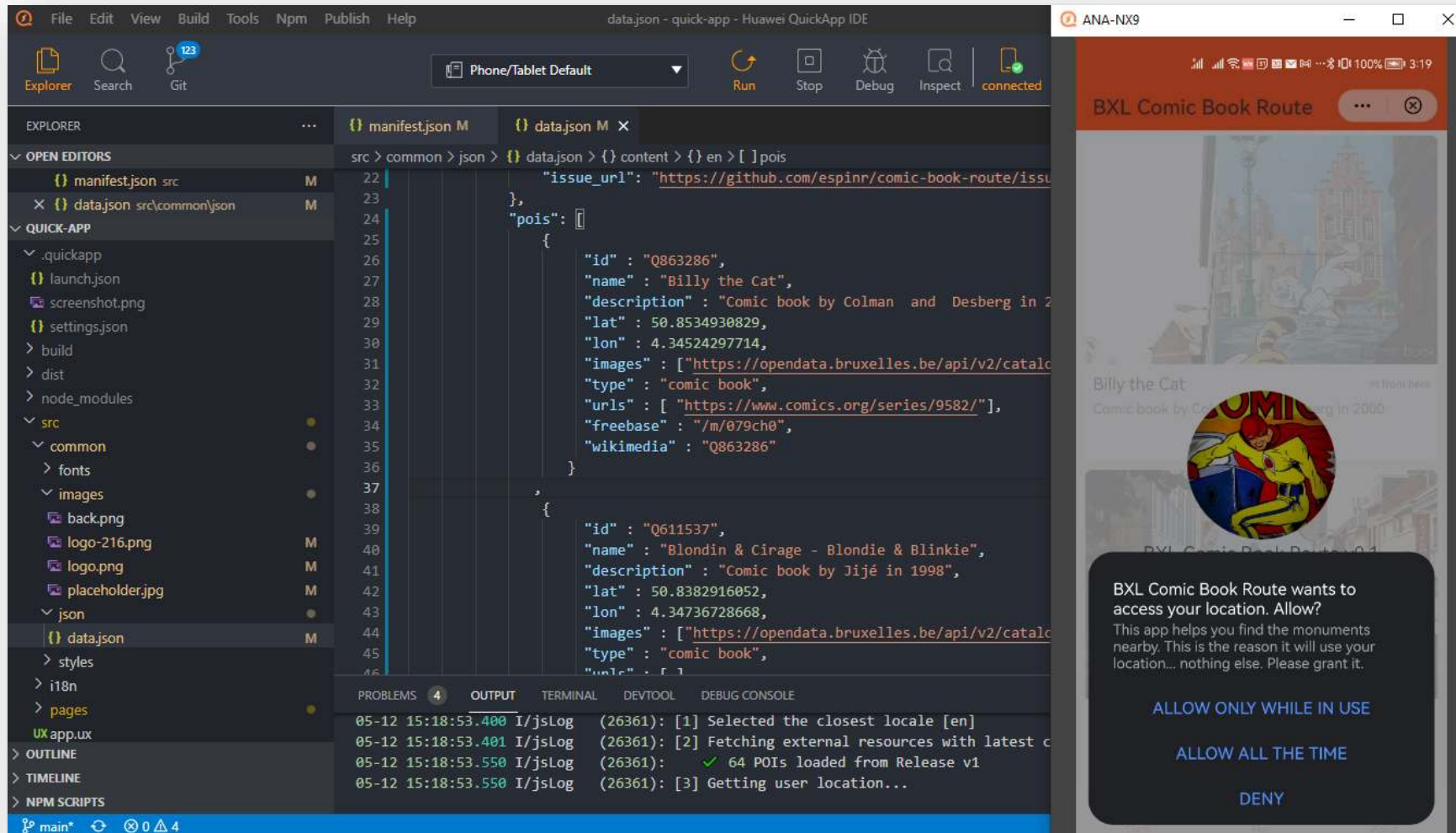
Step 4: upload content to GitHub

Step 5: configure the app

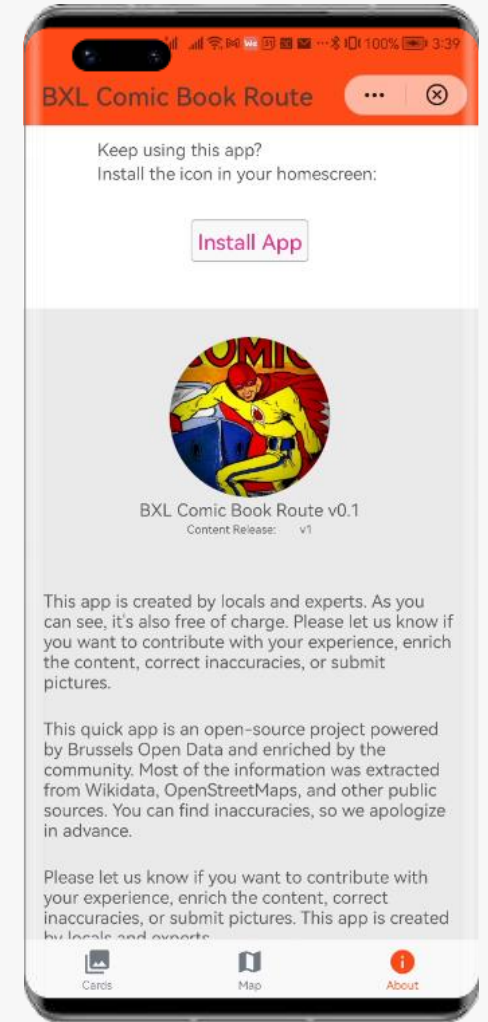
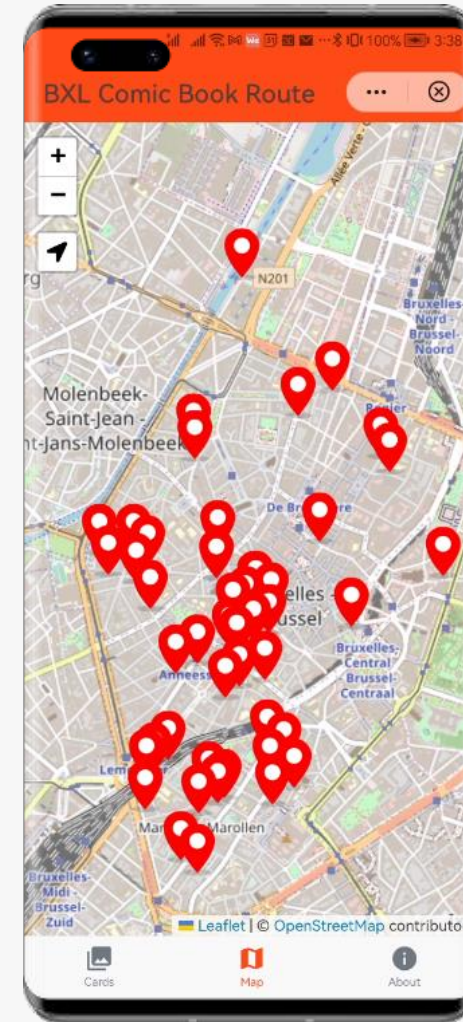
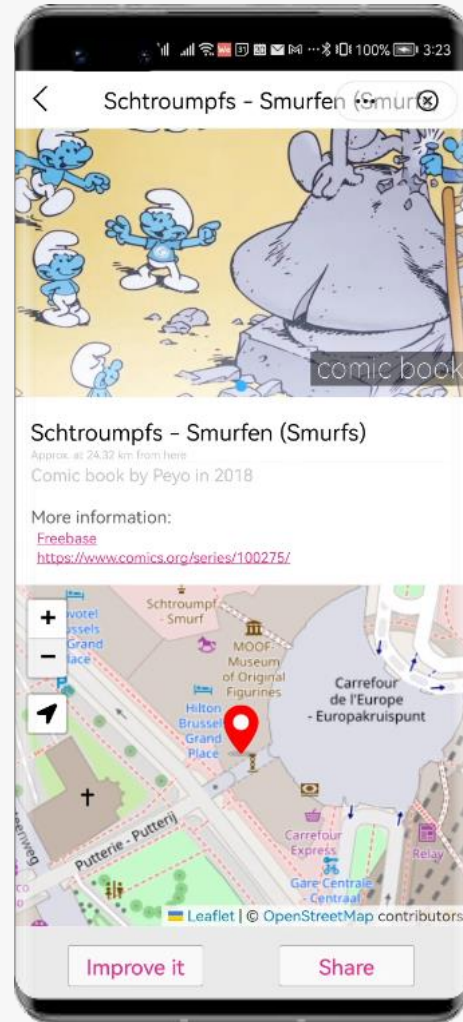
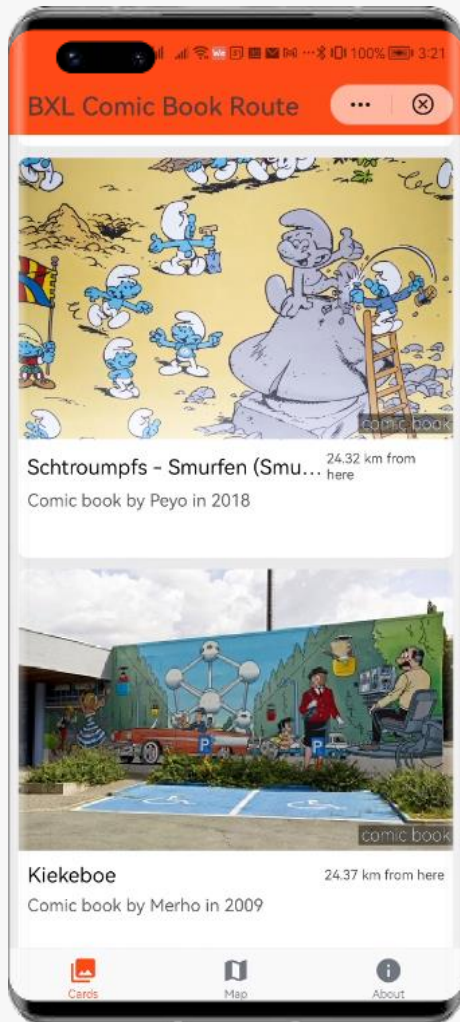
Step 6: run the app

Step-by-step example (an easy one)

Compile (generate an **RPK package**) and run the app



What we got



<https://github.com/pbesteu/comic-book-route-quick-app>

Customized for
Leuven (BE)...



<https://youtu.be/m8zpySR8t7M>

<https://github.com/pbesteu/cultural-heritage-quick-app>

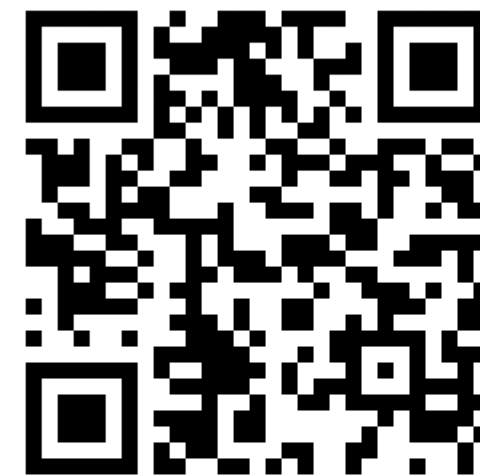
What about **Astronomy?**...



<https://youtu.be/TilDCRIq2ic>

<https://github.com/pbesteu/oeratoom-leuven-quick-app>

Shall we
start with
your idea?



Martin Alvarez
@espinr

Content under [CC BY 4.0](#)

Annexes

More details

Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

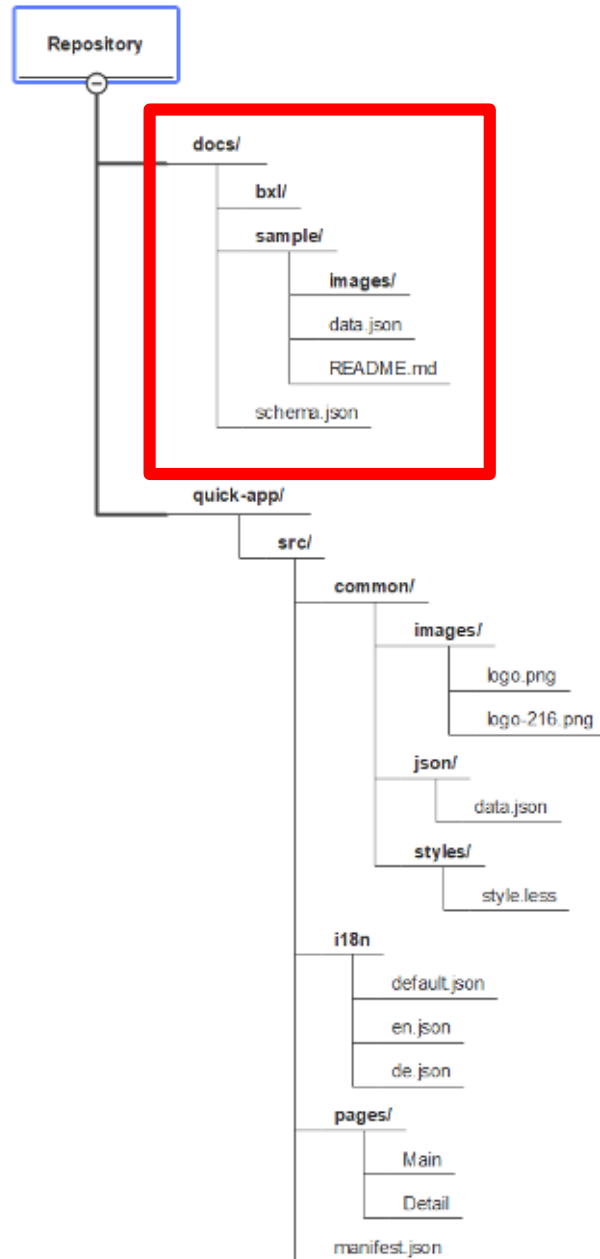
Step 4: upload content to GitHub

Step 5: configure the app

Step 6: run the app

Step-by-step example (an easy one)

Structure of **the code**



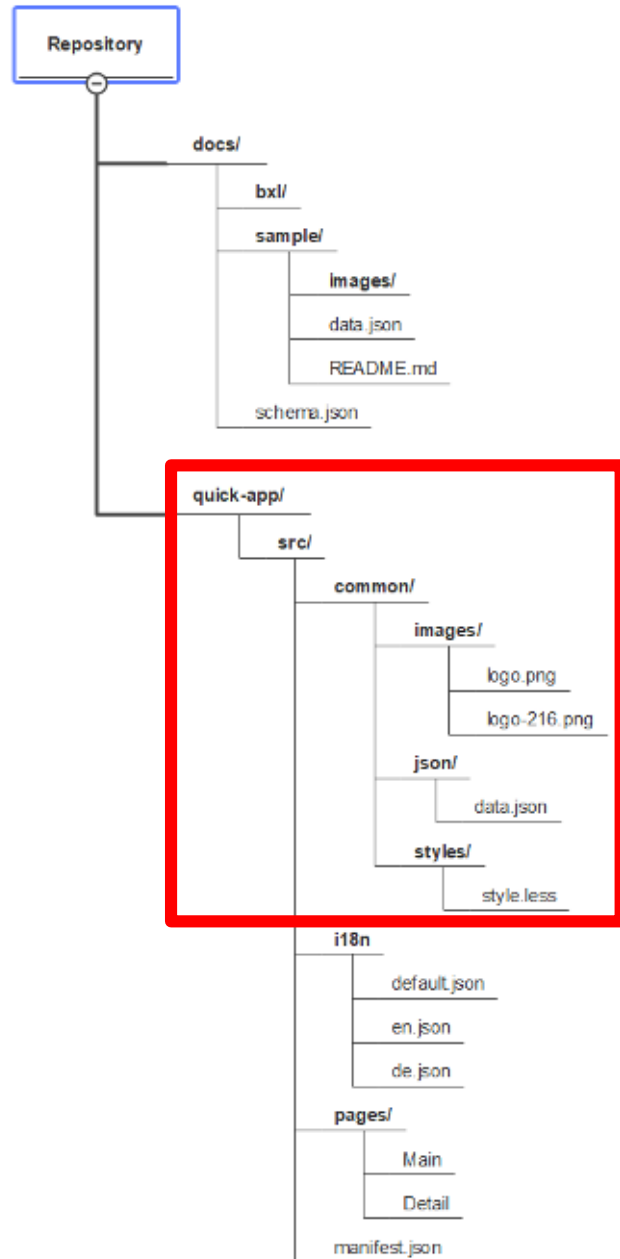
Database and images, publicly accessible
(also on the Web)

sample/ → example to rename and reuse

schema.json → JSON schema to validate the
database once it's updated.

data.json → database

Structure of **the code**

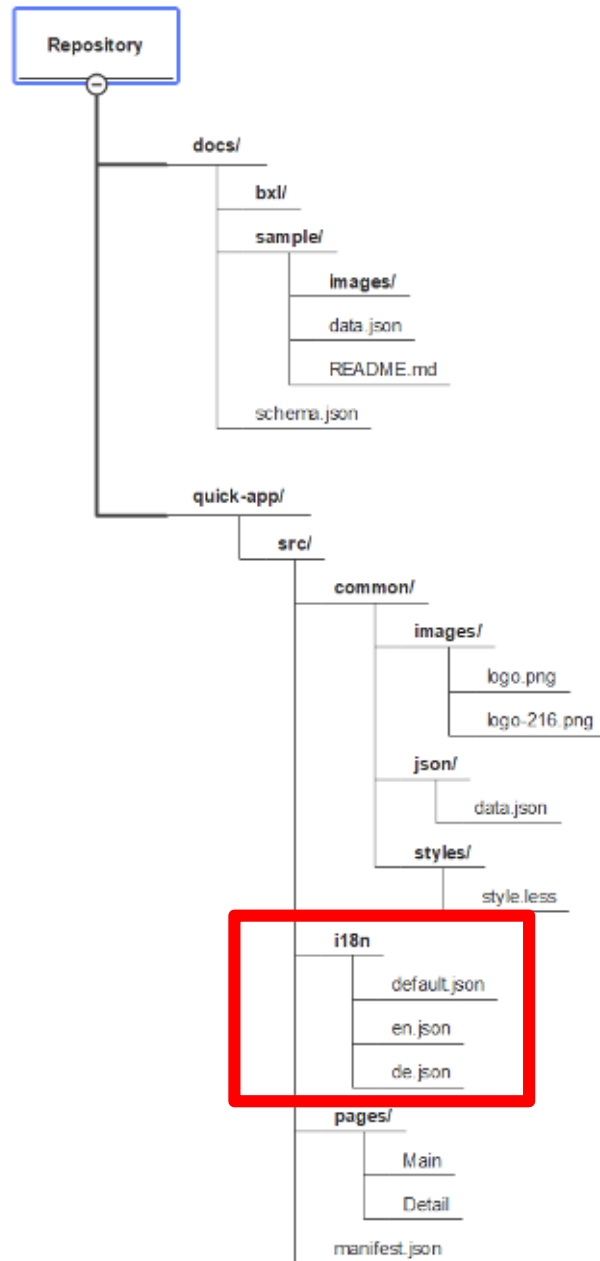


Quick App source code (need to compile before run)

common/ → media, images, resources

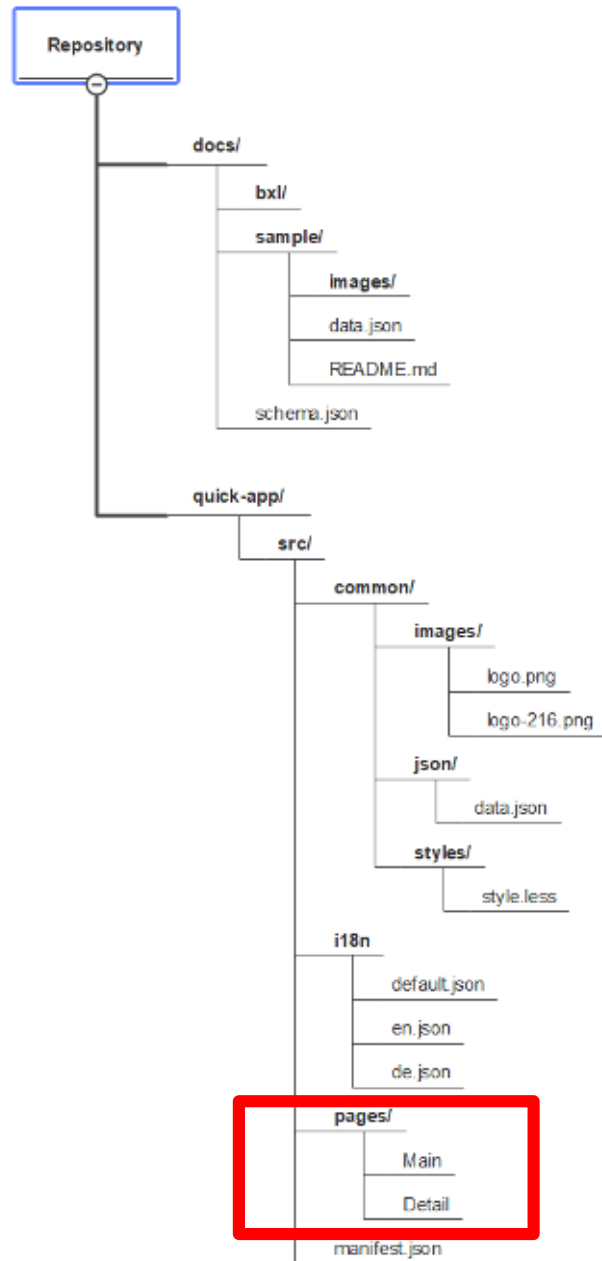
data.json → local version of the database (it will be replaced in case the app finds a more recent update on the Web).

Structure of the code



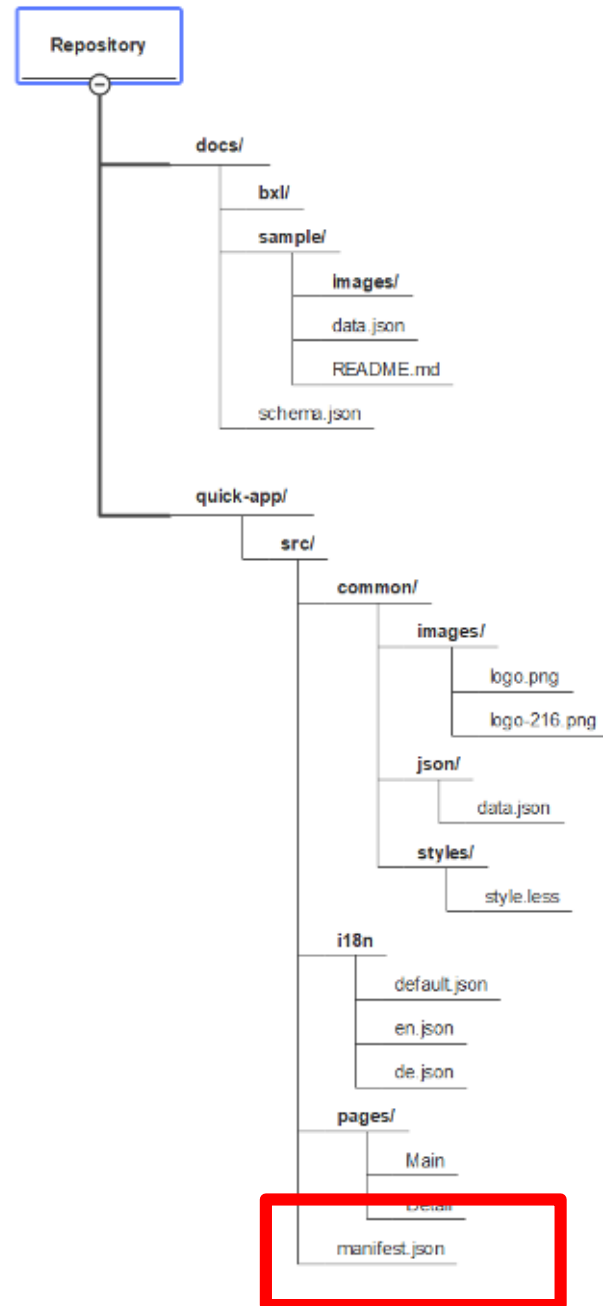
i18n/ → localization of the user interface

Structure of **the code**



pages/ → main components of the app

Structure of the code



manifest.json/ → app metadata and setup

Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

Step 4: upload content to GitHub

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Step 6: run the app

Step-by-step example (an easy one)

Publication of content on GitHub pages

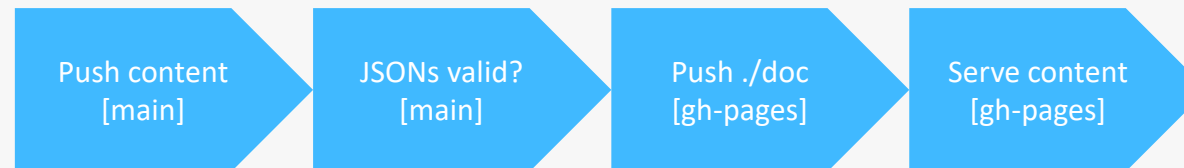
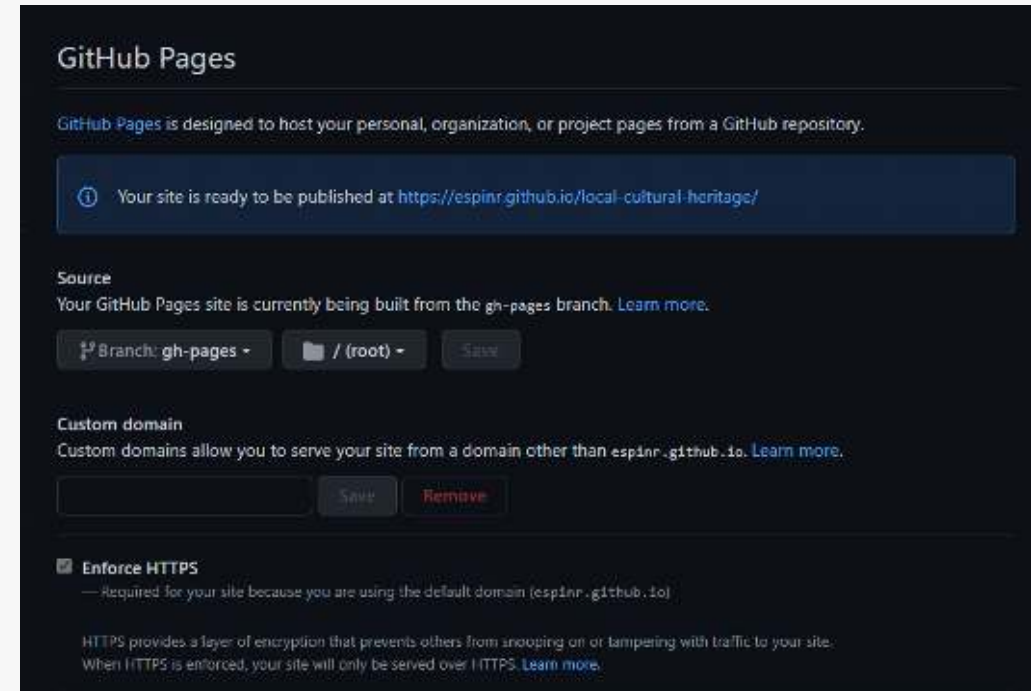
GitHub Settings > Pages

The content of the project (info, database and images) are served as HTML using GitHub pages.

There is a custom action to publish the `./doc` directory of the main repository into the `gh-pages` branch

GitHub is configured to serve the content of the root directory of the `gh-pages` (the last valid copy of the content in the repository).

If the latest version of the database JSON is not valid, the deployment is halted.



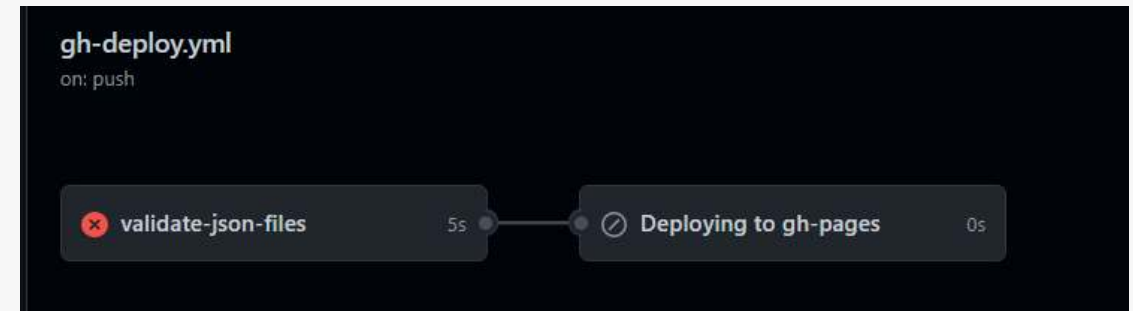
Validation of JSON files (continuous integration actions)

After every update, the new JSON files are validated against a JSON Schema

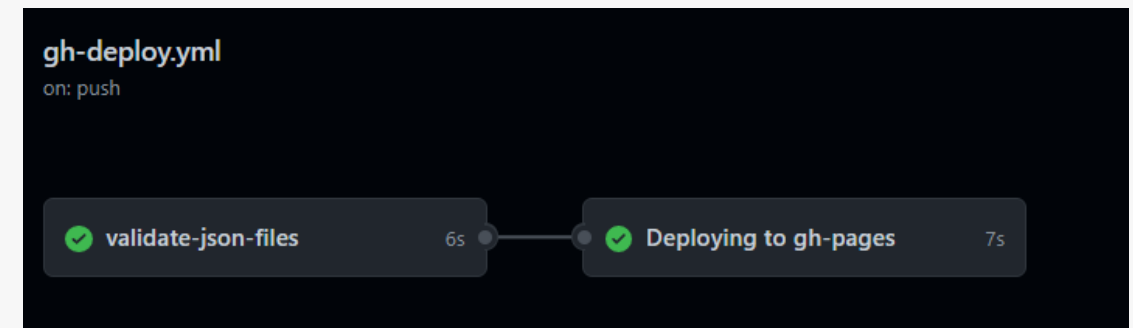
This prevents mistakes and corrupt databases causing fails in the app.

```
name: Validate JSON data and config files
on: [push]
jobs:
  validate-json-files:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v3
      - uses: vanekj/validate-json-action@v1.0.0
        with:
          schema: docs/schema.json
          pattern: docs/**/*.json
```

Wrong JSONs (deployment halted)



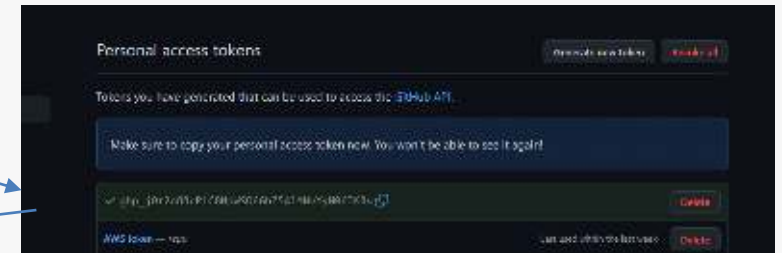
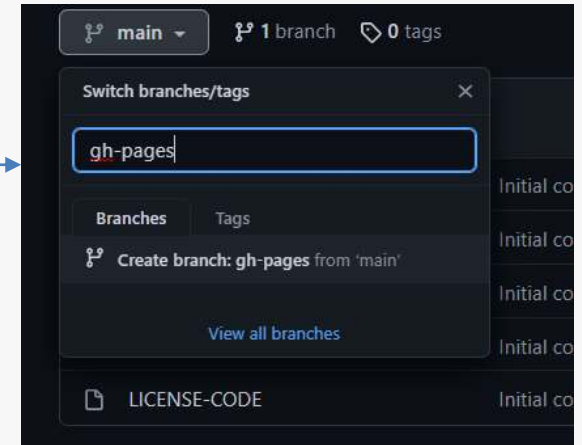
Valid JSONs



Activate GitHub Pages

If you cloned the project, you also have access to all the CI actions and configure these steps:

1. Create a **gh-pages** branch that will be used to publish the content.
2. Create a personal token
 - a) (Profile > Settings > Developer Settings > Personal access tokens)
 - b) Generate new token > Add a name + [no expiration] + check “repo” in the scope > Generate token
 - c) Copy the token generated in the clipboard
3. Create a secret with your token
 - a) Project’s Settings > (Security) Secrets > Actions
 - b) New repository secret with
 - Name: `ACCESS_TOKEN`
 - Value: the token (in your clipboard)
4. You can verify that the CI Action works properly (Project’s Actions) → re-run the jobs with failure (after that, they must be in green)
5. In project’s Settings > Pages you can see the public URL of your site with the template of the documentation.



Step 1: clone & configure the project

Step 2: the database

Step 3: customize the app

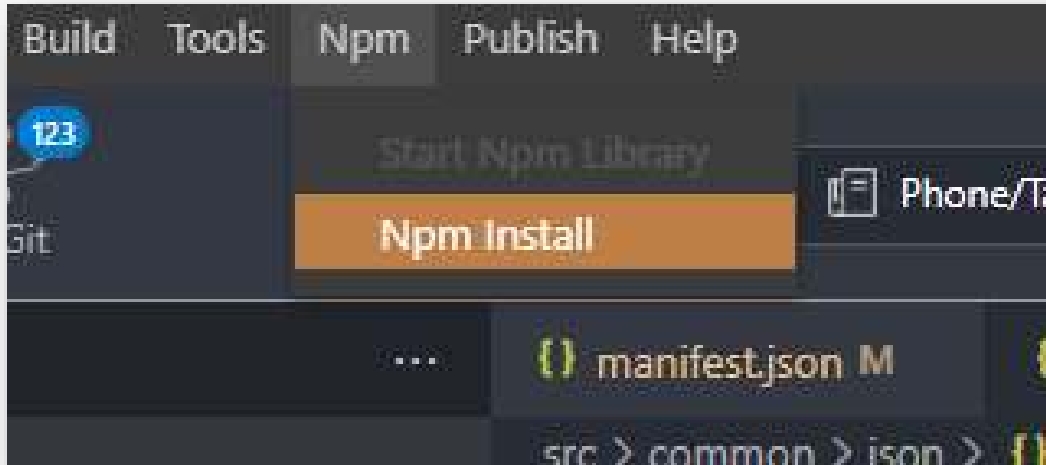
Step 4: upload content to GitHub

Step 5: configure the app

Step 6: run the app

Step-by-step example (an easy one)

Install the dependencies



```
$> npm install
```

The app requires `geolib` for geographic functions (e.g., `getDistance(from, to)`)

Other libraries may be added to the `package.json`

A big thanks to

Pictograms:

- Cloud by Aya Sofya from NounProject.com
- App by Adrien Coquet from NounProject.com
- Folder by HideMaru from NounProject.com
- Jpg by Ilham Fitrotul Hayat from NounProject.com
- Json by Md Moniruzzaman from NounProject.com
- Csv by Ilham Fitrotul Hayat from NounProject.com
- User by Benny Chaw from NounProject.com
- Terminal by Hare Krishna from NounProject.com