

# Wikibase and Wikidata





# Wikidata Knowledge Graph



- **Large knowledge graph** with ~1B facts about ~100M items
- **Fine-grained ontology**: ~2M types; ~10K properties
- **Multilingual**, names and strings tagged with language id
- Links entity's **Wikimedia pages** in many language and many other resources
- Entities have a canonical **name**, **aliases** and **short description** in multiple languages plus many key facts
- Queried using SPARQL query language
- See this account of its [history](#) and how it launched in 2012

The screenshot shows the Wikidata page for 'The Shadow Brokers' (Q27134643). The page includes a description: 'computer hacker group that released sensitive NSA data'. It features a table for labels in multiple languages and a section for statements.

Language	Label	Description	Also known as
English	The Shadow Brokers	computer hacker group that released sensitive NSA data	Shadow brokers
Spanish	The Shadow Brokers	No description defined	
Traditional Chinese	No label defined	No description defined	
Chinese	影子经纪人	No description defined	

**Statements**

- instance of: hacker group (0 references, + add reference, + add value)
- native label: The Shadow Brokers (English) (0 references, + add reference)

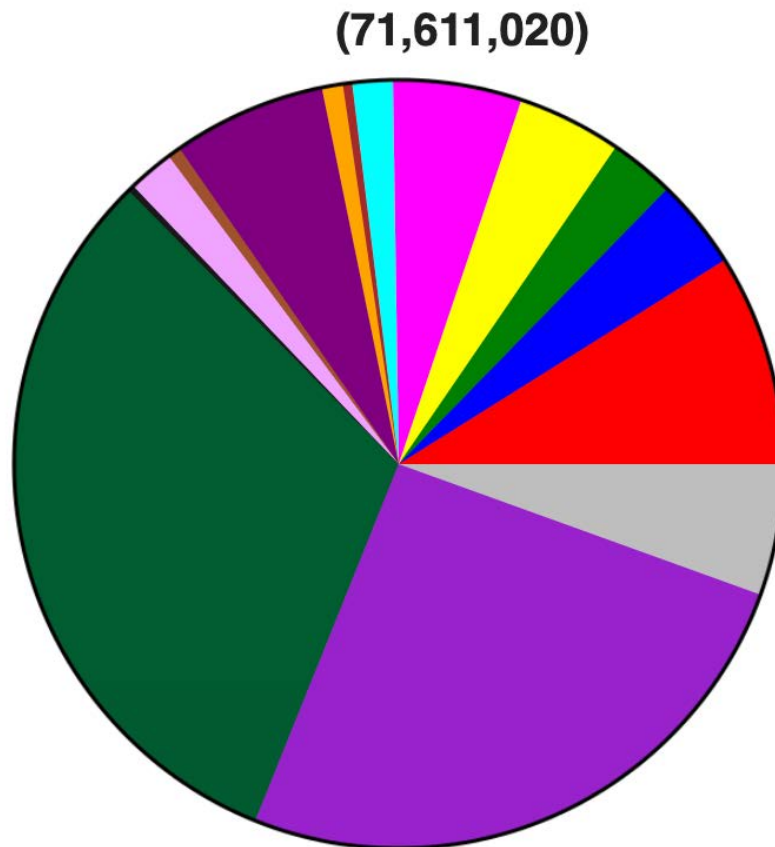
[Q27134643](https://www.wikidata.org/wiki/Q27134643)

# Wikibase is...



- [Wikibase](#): structured data repository based on [MediaWiki](#)
- Complex/expressive data model has triples, provenance, qualifiers, and alternate values
- Export to standard formats including JSON, RDF/XML, N3, and Turtle
- Its RDF model is queryable via SPARQL
- Local installs via a Docker image
- Stored in a custom database rather than a standard triple store

# Wikidata Statistics



Data from Feb. 2020, Wikidata is 50% larger now. But the proportions may be similar

- human: 6,376,879 (8.9%)
- taxon: 2,726,046 (3.8%)
- administrative territorial entity: 1,943,285 (2.7%)
- architectural structure: 3,159,472 (4.4%)
- occurrence: 3,898,674 (5.4%)
- chemical compound: 1,188,724 (1.7%)
- film: 294,370 (0.4%)
- thoroughfare: 630,794 (0.9%)
- astronomical object: 4,601,733 (6.4%)
- Wikimedia list article: 404,454 (0.6%)
- Wikimedia disambiguation page: 1,358,230 (1.9%)
- Wikinews article: 195,900 (0.3%)
- scholarly article: 22,574,314 (31.5%)
- other P31/P279: 18,284,676 (25.5%)
- no P31/P279: 3,973,469 (5.5%)

# What may seem weird...



- Wikidata Items and properties do not have noraml, natural language based names
  - Motivation is to be truly multilingual
- **Items** begin with a **Q** and **properties** with a **P**;  
both continue with a sequence of digits
- Anyone can create a new Q item, but P properties are a controlled vocabulary
  - Adding a property starts with making a [proposal](#)
  - See this [page](#) of all properties organized by topic

# Minding your Ps and Qs

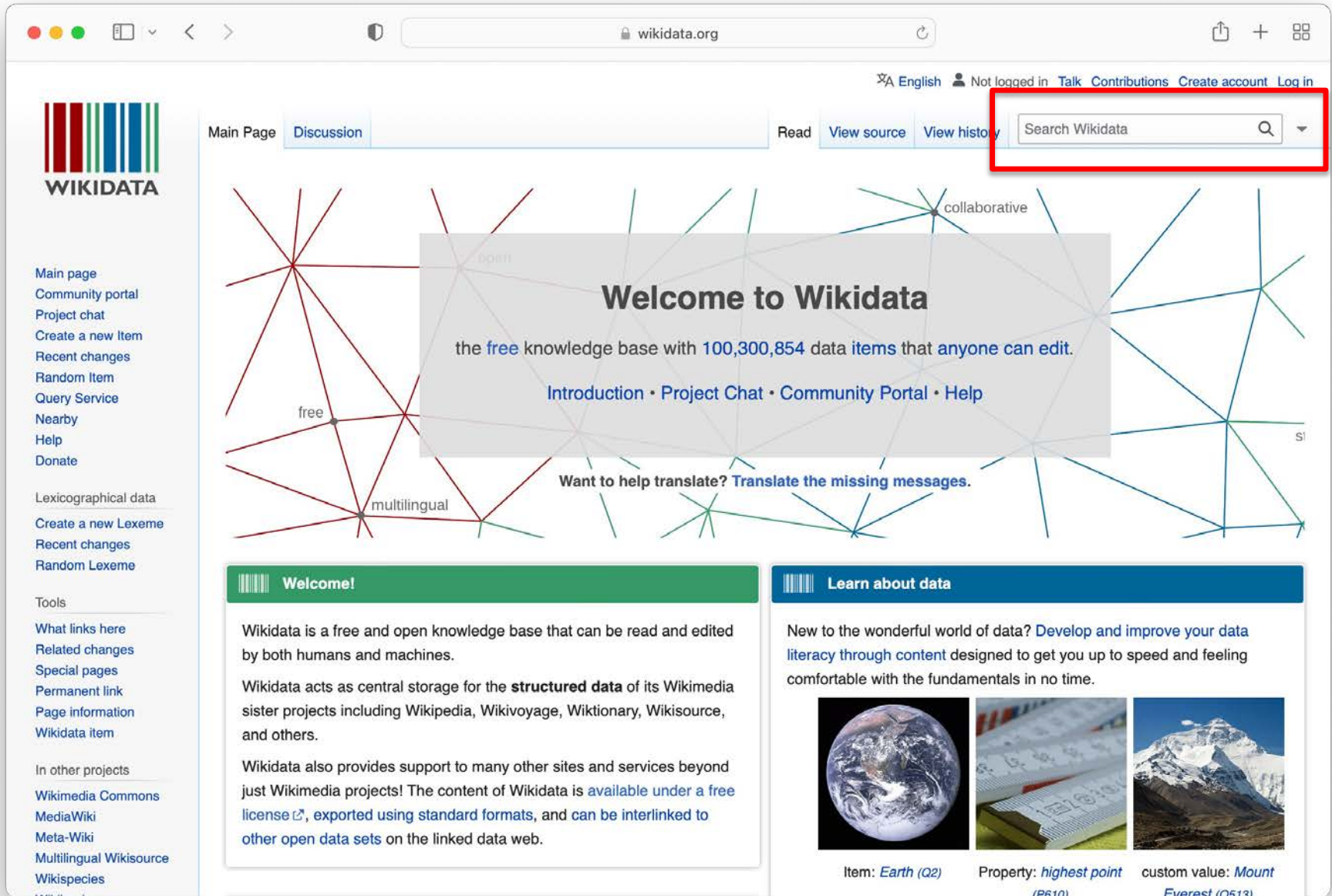
- [Q1: Universe](#)
- [Q2: Earth](#)
- [Q3: Life](#)
- [Q4: Death](#)
- [Q5: human](#)
- [Q42: Douglas Adams](#)
- [Q735049: UMBC](#)
- [Q113553960: Hacking tool](#)

- [P31: instance of](#)
- [P279: subclass of](#)
- [P108: employer](#)
- [P306: operating system](#)
- [P683: Chem. formula ID](#)

To make it easy for us,

- The human interface for viewing, exploring, and editing displays the RDFS label of an entity or property
- The SPARQL query interface shows

# Finding things on Wikidata



The image shows a screenshot of the Wikidata website. The browser's address bar shows "wikidata.org". The page features a navigation menu at the top with "Main Page" and "Discussion" tabs. A search bar labeled "Search Wikidata" is highlighted with a red box. The main content area displays a network diagram with nodes and connecting lines, and a central text box that reads "Welcome to Wikidata" and "the free knowledge base with 100,300,854 data items that anyone can edit." Below this, there are links for "Introduction", "Project Chat", "Community Portal", and "Help". A green box on the left contains the text "Welcome!" and a blue box on the right contains the text "Learn about data".

Wikidata

Main Page Discussion Read View source View history Search Wikidata

collaborative

## Welcome to Wikidata

the free knowledge base with 100,300,854 data items that anyone can edit.

[Introduction](#) • [Project Chat](#) • [Community Portal](#) • [Help](#)

free

multilingual

Want to help translate? [Translate the missing messages.](#)

### Welcome!




Wikidata is a free and open knowledge base that can be read and edited by both humans and machines.

Wikidata acts as central storage for the **structured data** of its Wikimedia sister projects including Wikipedia, Wikivoyage, Wiktionary, Wikisource, and others.

Wikidata also provides support to many other sites and services beyond just Wikimedia projects! The content of Wikidata is [available under a free license](#), exported using standard formats, and can be [interlinked to other open data sets](#) on the linked data web.

### Learn about data

New to the wonderful world of data? [Develop and improve your data literacy through content](#) designed to get you up to speed and feeling comfortable with the fundamentals in no time.



Item: *Earth (Q2)*    Property: *highest point (P610)*    custom value: *Mount Everest (Q513)*



# Wikidata's search has options

The screenshot shows the Wikidata search interface. The search term 'employees' is entered in the search bar. The search options are highlighted with a red box:

- Search:** A blue button with a magnifying glass icon and the text 'Search'.
- Advanced search:** A dropdown menu with the text 'Sort by relevance' and a close button 'X'.
- Search in:** A dropdown menu with two options: '(Main)' and 'Property', both with close buttons 'X'.

The search results show the following items:

- employees (P1128)**  
total number of employees of a company at a given "point in time" (P585). Most recent data would generally have preferred rank; data for previous years normal rank (not deprecated rank). Add data for recent years, don't overwrite  
24 statements, 0 sitelinks - 11:04, 4 November 2022
- personnel (Q105764136)**  
group of **employees** of an entity  
1 statement, 0 sitelinks - 21:21, 8 March 2021
- Employees (Q104710734)**  
subject category of the 20th Century Press Archives  
3 statements, 0 sitelinks - 17:29, 7 January 2021
- government employee (Q3796928)**  
employee who works for a state  
18 statements, 4 sitelinks - 05:48, 30 October 2022
- labor union (Q178790) : employees' union**

The page also shows the Wikidata logo, navigation links, and a search bar at the top right.

[Try it](#)

# https://wikidata.org/wiki/Q1

The screenshot shows the Wikidata page for 'universe' (Q1). The page layout includes a top navigation bar with the Wikidata logo, a search bar, and user options. The main content area features a table with columns for Language, Label, Description, and Also known as. The table lists the English label 'universe' and the Spanish label 'universo', along with their respective descriptions and a list of alternative names.

Item [Discussion](#) [Read](#) [View history](#)

## universe (Q1)


all of space and time and their contents  
cosmos | space | world | creation | system | metagalaxy | existence | all | macrocosm | outer space | everything | the universe | the cosmos  
| heaven and earth | yin and yang

[In more languages](#)  
Configure

Language	Label	Description	Also known as
English	universe	all of space and time and their contents	cosmos space world creation system metagalaxy existence all macrocosm outer space everything the universe the cosmos heaven and earth yin and yang
Spanish	universo	la totalidad formada por el espacio, el tiempo, la materia y la energía	cosmos espacio universos nuestro universo nuestro cosmos El Universo El Espacio

Visit

# <https://www.wikidata.org/wiki/Q42>



WIKIDATA

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

Print/export  
Create a book  
Download as PDF  
Printable version

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

wikidata.org

English Not logged in Talk Contributions Create account Log in

Item Discussion Read View history Search Wikidata

## Douglas Adams (Q42)

English writer and humorist  
Douglas Noel Adams | Douglas Noël Adams | Douglas N. Adams


In more languages  
Configure

Language	Label	Description	Also known as
English	Douglas Adams	English writer and humorist	Douglas Noel Adams Douglas Noël Adams Douglas N. Adams
Spanish	Douglas Adams	escritor y humorista británico	Douglas Noel Adams Douglas Noël Adams
Traditional Chinese	道格拉斯·亞當斯	英國作家	
Chinese	道格拉斯·亚当斯	英国作家	亞當斯

All entered languages

### Statements

instance of human  
↳ 2 references

image 

# <https://wikidata.org/wiki/Special:EntityData/Q42.json>

```
{"entities":{"Q42":{"pageid":138,"ns":0,"title":"Q42","lastrevid":1065557227,"modified":"2019-11-29T18:46:12Z","type":"item","id":"Q42","labels":{"fr":{"language":"fr","value":"Douglas Adams"},"ru":{"language":"ru","value":"\u0414\u0443\u0433\u043b\u0430\u0441 \u0410\u0434\u0430\u043c\u0441"},"pl":{"language":"pl","value":"Douglas Adams"},"it":{"language":"it","value":"Douglas Adams"},"en-gb":{"language":"en-gb","value":"Douglas Adams"},"nb":{"language":"nb","value":"Douglas Adams"},"es":{"language":"es","value":"Douglas Adams"},"en-ca":{"language":"en-ca","value":"Douglas Adams"},"hr":{"language":"hr","value":"Douglas Adams"},"pt":{"language":"pt","value":"Douglas Adams"},"ko":{"language":"ko","value":"\ub354\uae00\b7ec\uc2a4 \uc560\b364\uc2a4"},"nl":{"language":"nl","value":"Douglas Adams"},"el":{"language":"el","value":"\u0394\u03c4\u03ac\u03b3\u03ba\u03bb\u03b1\u03c2 \u0386\u03bd\u03c4\u03b1\u03bc\u03c2"},"ar":{"language":"ar","value":"\u062f\u0648\u063a\u0644\u0627\u0633 \u0622\u062f\u0645\u0632"},"arz":{"language":"arz","value":"\u062f\u0648\u062c\u0644\u0627\u0633 \u0622\u062f\u0645\u0632"},"bar":{"language":"bar","value":"Douglas Adams"},"be":{"language":"be","value":"\u0414\u0443\u0433\u043b\u0430\u0441 \u0410\u0434\u0410\u043c\u0410\u0441"},"bg":{"language":"bg","value":"\u0414\u044a\u0433\u043b\u0430\u0441 \u0410\u0414\u0410\u043c\u0410\u0441"},"bs":{"language":"bs","value":"Douglas Adams"},"ca":{"language":"ca","value":"Douglas Adams"},"cs":{"language":"cs","value":"Douglas Adams"},"cy":{"language":"cy","value":"Douglas Adams"},"da":{"language":"da","value":"Douglas Adams"},"eo":{"language":"eo","value":"Douglas Adams"},"et":{"language":"et","value":"Douglas Adams"},"fa":{"language":"fa","value":"\u062f\u0627\u0627\u0644\u0627\u0633 \u0622\u062f\u0645\u0632"},"fi":{"language":"fi","value":"Douglas Adams"},"ga":{"language":"ga","value":"Douglas Adams"},"gl":{"language":"gl","value":"Douglas Adams"},"he":{"language":"he","value":"\u05d3\u05d0\u05d2\u05dc\u05e1 \u05d0\u05d3\u05de\u05e1"},"hu":{"language":"hu","value":"Douglas Adams"},"id":{"language":"id","value":"Douglas Adams"},"io":{"language":"io","value":"Douglas Adams"},"is":{"language":"is","value":"Douglas Adams"},"ja":{"language":"ja","value":"\u30c0\u30b0\u30e9\u30b9\u30fb\u30a2\u30c0\u30e0\u30ba"},"jv":{"language":"jv","value":"Douglas Adams"},"ka":{"language":"ka","value":"\u10d3\u10d0\u10d2\u10da\u10d0\u10e1 \u10d0\u10d3\u10d0\u10db\u10e1\u10d8"},"la":{"language":"la","value":"Duglassius Adams"},"lv":{"language":"lv","value":"Duglass Adamss"},"mk":{"language":"mk","value":"\u0414\u0430\u0433\u043b\u0430\u0441 \u0410\u0414\u0410\u041c\u0410\u0441"/>
```

# The entity in JSON

```
Q42.json — ~/Downloads
Q42.json
1  {
2    "entities": {
3      "Q42": {
4        "pageid": 138,
5        "ns": 0,
6        "title": "Q42",
7        "lastrevid": 1065557227,
8        "modified": "2019-11-29T18:46:12Z",
9        "type": "item",
10       "id": "Q42",
11 >  "labels": {⋮},
637 >  "descriptions": {⋮},
967 >  "aliases": {⋮},
1325 >  "claims": {⋮},
10236 >  "sitelinks": {⋮}
10916   }
10917   }
10918 }
```

~/Downloads/Q42.json\* 11:7


1 LF UTF-8 JSON GitHub Git (0) 1 update

# <https://wikidata.org/wiki/Special:EntityData/Q42.ttl>

```
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
@prefix ontolex: <http://www.w3.org/ns/lemon/ontolex#> .
@prefix dct: <http://purl.org/dc/terms/> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix wikibase: <http://wikiba.se/ontology#> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .
@prefix schema: <http://schema.org/> .
@prefix cc: <http://creativecommons.org/ns#> .
@prefix geo: <http://www.opengis.net/ont/geosparql#> .
@prefix prov: <http://www.w3.org/ns/prov#> .
@prefix v: <http://www.wikidata.org/value/> .
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix data: <https://www.wikidata.org/wiki/Special:EntityData/> .
@prefix s: <http://www.wikidata.org/entity/statement/> .
@prefix ref: <http://www.wikidata.org/reference/> .
@prefix wdt: <http://www.wikidata.org/prop/direct/> .
@prefix wdt_n: <http://www.wikidata.org/prop/direct-normalized/> .
@prefix p: <http://www.wikidata.org/prop/> .
@prefix ps: <http://www.wikidata.org/prop/statement/> .
@prefix ps_v: <http://www.wikidata.org/prop/statement/value/> .
@prefix ps_n: <http://www.wikidata.org/prop/statement/value-normalized/> .
@prefix pq: <http://www.wikidata.org/prop/qualifier/> .
@prefix pq_v: <http://www.wikidata.org/prop/qualifier/value/> .
@prefix pq_n: <http://www.wikidata.org/prop/qualifier/value-normalized/> .
@prefix pr: <http://www.wikidata.org/prop/reference/> .
@prefix pr_v: <http://www.wikidata.org/prop/reference/value/> .
@prefix pr_n: <http://www.wikidata.org/prop/reference/value-normalized/> .
@prefix wdno: <http://www.wikidata.org/prop/novalue/> .

data:Q42 a schema:Dataset ;
  schema:about wd:Q42 ;
  cc:license <http://creativecommons.org/publicdomain/zero/1.0/> ;
  schema:softwareVersion "1.0.0" ;
```

# Wikidata Query Service (WDQS)

- Let's query Wikidata's [WDQS](#) to see when Douglas Adams was born
- We'll need to know that Douglas Adams is **wd:Q42** and date of birth is **wdt:P569**
- If we click on  on the left side of the WDQS we can see labels or enter names

[Try it](#)

# Wikibase Data Model

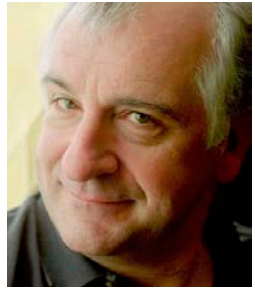
- **Item** = subjects = entities
- **Property** = properties
- **Value** = entities or datatypes (string, number, ...)
- **Snak** = basic assertion about item, i.e., Property-Value pair, "small, but more than a byte"
  - Some are simple claims: *population Berlin 3,499,879*
  - Others (e.g., types) are structural: *type Berlin City*
  - Others include claim **qualifiers**  
*Population Berlin 3,499,879; considering only territory of city, as estimated on 30 November 2011*



# Items have

- **Item identifier** (number prefixed with Q)
- **Fingerprint**, consisting of:
  - Multilingual **label**\*
  - Multilingual **description**\*
  - Multilingual **aliases**
- **Statements**, each consisting of:
  - **Claim**, consisting of:
    - Property
    - Value
    - Qualifiers (additional property-value pairs)
  - **References** (each with one or more property-value pairs)
  - **Rank**
- **Site links**

# Statements...



- A statement may have:
  - one property (in the example, P551 “residence”)
  - one value (Q84 “London”)
  - optionally one or more qualifiers (e.g, property:P582, “end time” 11 May 2011)
  - optional reference(s) (e.g., property:P143 “imported from Wikipedia”)
- The property, value, and qualifiers together are also called the **claim**, which together with any source references forms a statement

# Properties have ...

- **Property identifier** (number prefixed with *P*)
- **Fingerprint**, consisting of:
  - Multilingual **label**\*
  - Multilingual **description**\*
  - Multilingual **aliases**
- **Statements**, each consisting of:
  - **Claim**, consisting of:
    - Property
    - Value
    - Qualifiers (additional property-value pairs)
  - **References** (each with one or more property-value pairs)
  - **Rank**
- **Datatype**

label — **Douglas Adams** (Q42) — item identifier

description — English writer and humorist  
Douglas Noël Adams | Douglas Noel Adams — aliases  
▶ In more languages

### Statements

property — **educated at** — value  
St John's College — qualifiers

end time	1974
academic major	English literature
academic degree	Bachelor of Arts
start time	1971

rank —  
statement group —

▼ 2 references — opened references

stated in	Encyclopædia Britannica Online
reference URL	<a href="http://www.nndb.com/people/731/000023662/">http://www.nndb.com/people/731/000023662/</a>
original language of work	English
retrieved	7 December 2013
publisher	NNDB
title	Douglas Adams (English)

Brentwood School — collapsed reference

end time	1970
start time	1959

▶ 0 references

+ add (statement)

# Statements...

- Requirement: "Wikibase will not be about the truth, but about statements and their references"
- Doesn't model items, but statements about them
- Not "Douglas Adams residence is London"
- But "There's a statement of Douglas Adams having a residence of London prior to 11 May 2011 according to Wikipedia"

# Example: Trumps spouses

- Who are Donald Trump's spouses?
- We must identify the IDs for
  - Donald Trump: **Q22686**
  - Spouse property: **P26**
- Write and run a simple SPARQL query
- Enter it in [Wikidata's query service](#)
  1. [First try](#)
  2. [Second try](#): ask for a label
  3. [Third try](#): restrict to just English label
  4. [Final try](#): using the [label service](#)

# But what about the other spouses?

- Query only returns one answer: his *current* spouse
- Other values do have an end time
- Maybe that's a feature!
- Let's try another query: what schools did Donald Trump attend?

spouse	
Ivana Trump	<a href="#">edit</a>
start time	7 April 1977
end time	22 March 1992
end cause	divorce
<a href="#">1 reference</a>	
Marla Maples	<a href="#">edit</a>
end time	8 June 1999
start time	19 December 1993
end cause	divorce
<a href="#">1 reference</a>	
Melania Trump	<a href="#">edit</a>
start time	22 January 2005
place of marriage	Mar-a-Lago
<a href="#">1 reference</a>	
<a href="#">+ add value</a>	

[Visit](#)

# Property Rank

- We get four schools, even tho all have end dates (we might quibble that Penn & Wharton are the same)
- Does Wikidata's ontology know that *spouse* ([P26](#)) is a temporal quality & *educated at* ([P69](#)) isn't?
- No, though property has some [constraints](#) that might be useful
- The mechanism used is to give each value a [rank](#), which provides a way to annotate [multiple values for a statement](#).

educated at	Fordham University	August 1964	1966	- 0 references		
	The Wharton School	May 1968	economics	Bachelor of Science	1966	- 0 references
	The Kew-Forest School	1964	- 0 references			
	New York Military Academy	1964	1959	- 0 references		
	University of Pennsylvania	1 reference				

[Visit](#)



Marla Maples



Melania Trump



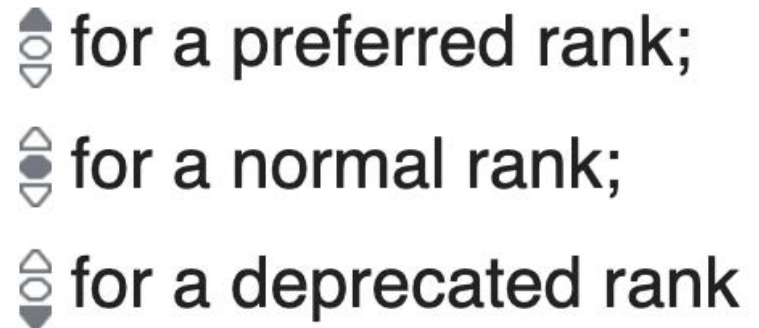
# Ranking claims

- **Preferred:** most current or values representing a consensus
- **Normal:** default; no judgement of a value's accuracy and currency
- **Deprecated:** errors or outdated

For DT's spouses, Melania has preferred rank and the others normal rank

All of DT's schools had normal rank

How are ranks represented in RDF and how does the Wikidata query service use them?



# WDQS Procedure

What's matched for **?s wdt:Pxxx ?o**

- If there's at least one ?o with preferred rank, only values preferred values are returned
- If there are no preferred values, all values with normal rank are returned
- Deprecated values are never returned.

The humans or bots populating the graph must figure out how to assign ranks

# Qualifiers, rank and references

Wikidata uses special namespaces to access a reified node with claim's qualifiers, rank & references

- **prefix p:** points not to object, but to statement node
- It is then subject of other triples
- Within a statement node:
  - **ps:** gets the object
  - **pq:** gets qualifier information
  - **wikibase:rank** gets rank information
  - **prov:wasDerivedFrom/pr:P248** gets reference values

The image shows a Wikidata page for Douglas Adams (Q42) with several annotations. The page content includes a label, description, and a list of statements. The annotations are as follows:

- label:** Points to "Douglas Adams (Q42)".
- item identifier:** Points to "(Q42)".
- description:** Points to "English writer and humorist".
- aliases:** Points to "Douglas Noël Adams | Douglas Noel Adams".
- property:** Points to the "educated at" statement.
- value:** Points to "St John's College".
- qualifiers:** Points to the "English literature Bachelor of Arts" box.
- rank:** Points to the "rank" field in the statement.
- statement group:** Points to the entire statement box.
- opened references:** Points to the "Encyclopædia Britannica, Online" reference box.
- collapsed reference:** Points to the "Brentwood School" reference box.

The statements shown are:

- educated at:** St John's College (ranked 1). Qualifiers: English literature, Bachelor of Arts. End time: 1974. Start time: 1971.
- references:** 2 references.
- Encyclopædia Britannica, Online:** reference URL: http://www.britannica.com/eb/people/731/000023662/. Original language of work: English. Retrieved: 7 December 2013. Publisher: NNDP. Title: Douglas Adams (English).
- Brentwood School:** End time: 1970. Start time: 1969.

# Example (1): Douglas Adams schools

```
# find schools attended with their start and end times
SELECT ?education ?educationLabel ?starttime ?endtime
WHERE {
  wd:Q42 p:P69 ?statement.
  ?statement ps:P69 ?education.
  ?statement pq:P580 ?starttime.
  ?statement pq:P582 ?endtime.
  SERVICE wikibase:label {bd:serviceParam wikibase:language "en"}
}
ORDER BY ?starttime
```

[Try it](#)

# Wikidata WDQS prefixes

PREFIX wd: <<http://www.wikidata.org/entity/>>

PREFIX wdt: <<http://www.wikidata.org/prop/direct/>>

PREFIX wds: <<http://www.wikidata.org/entity/statement/>>

PREFIX wdv: <<http://www.wikidata.org/value/>>

PREFIX wikibase: <<http://wikiba.se/ontology#>>

PREFIX p: <<http://www.wikidata.org/prop/>>

PREFIX ps: <<http://www.wikidata.org/prop/statement/>>

PREFIX pq: <<http://www.wikidata.org/prop/qualifier/>>

PREFIX rdfs: <<http://www.w3.org/2000/01/rdf-schema#>>

PREFIX bd: <<http://www.bigdata.com/rdf#>>

# Example (2): Douglas Adams schools

Simplify using the [\[\] syntax](#) to eliminate the ?statement variable

```
# find schools attended with their start and end times
SELECT ?education ?educationLabel ?starttime ?endtime
WHERE {
  wd:Q42 p:P69
  [ ps:P69 ?education;
    pq:P580 ?starttime;
    pq:P582 ?endtime. ]
  SERVICE wikibase:label {bd:serviceParam wikibase:language "en"}
}
ORDER BY ?starttime
```

[Try it](#)

# Example (3)

Here's an example getting rank information

```
# find all schools Douglas Adams attended and their ranks
SELECT ?education ?educationLabel ?rank
WHERE {
  wd:Q42 p:P69
    [ ps:P69 ?education;
      wikibase:rank ?rank ].
  SERVICE wikibase:label { bd:serviceParam wikibase:language "en". }
}
```

[Try it](#)

# Trumps Spouses

```
# Get all of Donald Trump's spouses, current, former, and
# deprecated along with their ranks
SELECT ?spouse ?spouseLabel ?rank
WHERE {
  wd:Q22686 p:P26
    [ ps:P26 ?spouse;
      wikibase:rank ?rank ].
  SERVICE wikibase:label { bd:serviceParam wikibase:language "en". }
}
```

[Try it](#)



# Deprecated values

- See this page on [deprecation](#)
- [Honoré de Balzac \(Q9711\)](#) has three values for [date of death \(P570\)](#)
  1. 1850
  2. 18 August 1850
  3. 19 August 1850
- The 18 August value is tagged as preferred with the reason most precise value ([Q71536040](#))
- The August 19 claim is tagged as deprecated, with the reason incorrect value ([Q41755623](#))
- The 1850 claim is not tagged so carries the default rank of normal

# Ontology Exploration

- wdtaxonomy is a useful commandline tool for exploring Wikidata's ontology
- Given a type (e.g, Q3918, university) you can quickly see
  - Subtypes or supertypes (immediate or inferred),
  - Number of instances (immediate or inferred),
  - Direct instances
  - Number Wikimedia sites it is in
  - And more
- Implemented in Javascript with a command line script
- Much faster than using SPARQL

```
$$ wdtaxonomy Q3918 -c -t
university (Q3918) •163 x15380 ↑↑
├─Universities in Germany (Q212462) •2
├─national university (Q265662) •11 x73
├─National University (Q366354) •5
├─Imperial universities of Japan (Q562092) •12
├─Byzantine university (Q622870) •4
├─college and university rankings (Q847843) •23 x45 ↑
├─public university (Q875538) •39 x974 ↑
├─private university (Q902104) •32 x846 ↑
├─new university (Q987075) •4 x1
├─Red brick university (Q1202123) •11
├─??? (Q1305046) •2
├─institute of technology (Q1371037) •20 x325
├─veterinary medicine school (Q1384955) •5 x28
├─online university (Q1407393) •4 x10 ↑
├─virtual university (Q1755248) •8 x11
├─├─online university (Q1407393) •4 x10 ↑ ...
├─comprehensive university (Q1767829) •2 x6
├─plate glass university (Q1902446) •8
├─medical university (Q1916585) •1 x9 ↑
├─??? (Q2073922) •1
├─pontifical university (Q2120466) •18 x37 ↑↑
├─Corporate university (Q2278672) •6
├─ancient university (Q2667285) •9 x1
├─central university (Q3351682) •12 x2
├─collegiate university (Q3354859) •9 x12
├─deemed university (Q3520135) •6 x16
├─university in France (Q3551775) •3 x75 ↑
├─Istituto superiore per le industrie artistiche (Q3803831) •2 x4
├─??? (Q3803846) •1 x2
├─Smolny Institute for Noble Maidens (Q4432880) •1
├─??? (Q4475845) •2
├─federal university (Q4481793) •3 x3
├─ecclesiastical university (Q5332280) •6 x2
├─labor universities (Q5690751) •1 x6
├─open university (Q6755402) •4 x1
├─Urban university (Q7900184) •2
├─??? (Q10387922) •1
├─international university (Q10829188) •3 x9
├─autonomous university (Q11057861) •2 x1
├─research university (Q15936437) •9 x224
├─Italian universities (Q20009854) •2
├─??? (Q20052016) •1 x2
├─Canciller de Universidad (Q21547263)
├─imperial university of the Russian Empire (Q28667313) •2 x12
├─universities in China (Q28700403) •1
├─Institute of National Importance (Q47531586) x1 ↑
├─campusuniversity (Q59537665) x3
├─Indiana University Bloomington Department of French and Italian (Q63441027)
├─Indiana University Department of French and Italian (Q63441251)
├─Indiana University Bloomington Department of History (Q63441447)
```

# Summary

- Wikidata is an important community-based knowledge graph that has many uses
- It has many unique features and includes
  - A good interface for humans to inspect & edit its data
  - An open SPARQL interface with a timeout at ~60 sec
  - APIs for search and creating bots
- It integrates information from Wikipedia sites as well as many other sources