

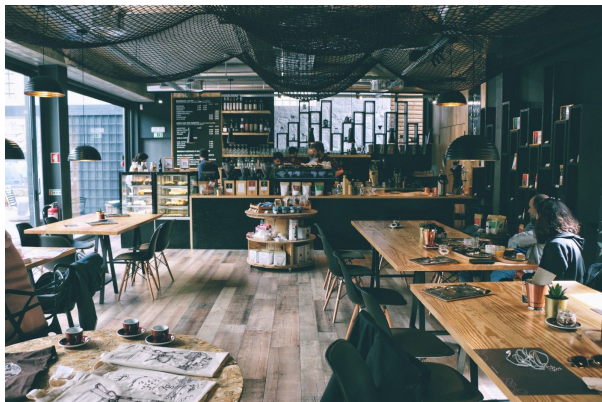
A Decade of Song Covers Knowledge Graph

By Duyen Nguyen and Naicih Liou

A blue square logo with the white text "ADSC" inside.

ADSC

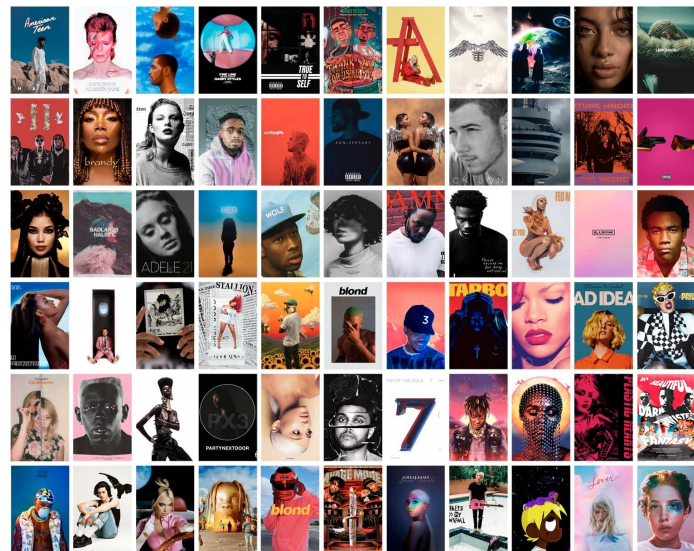
Objective



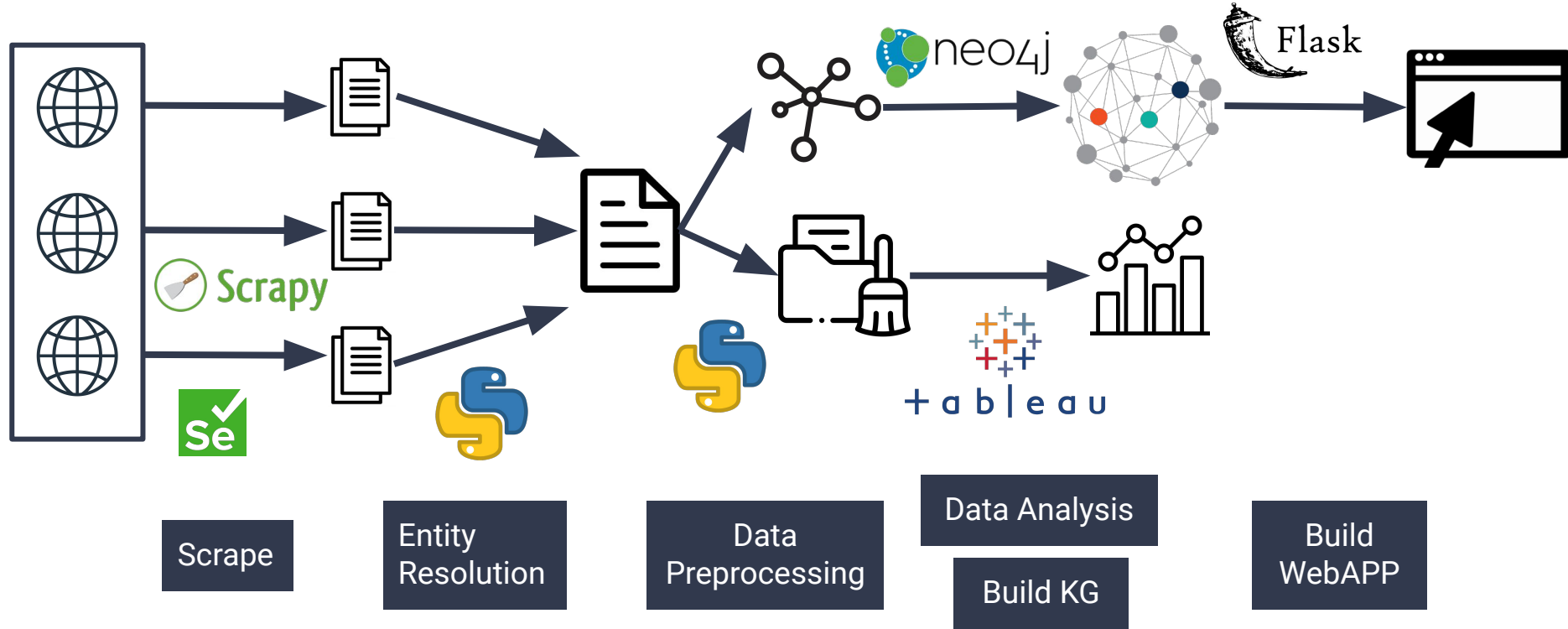
You heard a really good song cover but couldn't tell who the artist is.

You are curious if your favorite artist has covered other artists' work.

Building a knowledge graph of song covers from 2012-2022.



Methodology




Data Acquisition

ORIGINAL + ADD COVER

Memories by Maroon 5


YouTube Spotify Apple Music



Added by sebcatt

Written by Jon Bellion, JKash, Jordan Johnson, Stefan Johnson, Adam Levine, Michael Pollack, Vincent Ford

Language English

Released on  **Memories**
Single
September 20, 2019

Uses parts from Canon & Gigue in D written by Johann Pachelbel - element
No Woman, No Cry written by Vincent Ford - replayed sample
- Vincent Ford is credited on Memories as he was given the copyright royalties for No Woman, No Cry by Marley

Licensing [Request a synchronization license](#)

| Title | Performer | Release date | Info |
|----------|-----------------------------|--------------------|---------------|
| Memories | Maroon 5 | September 20, 2019 | First release |
| Memories | Jonah Baker | October 4, 2019 | Acoustic |
| Memories | Ben Woodward | October 11, 2019 | Acoustic |
| Memories | Ali Brustofski | October 23, 2019 | Acoustic |
| Memories | Landon Austin | October 25, 2019 | Acoustic |
| Memories | Zita feat. Ben Woodward | November 5, 2019 | |
| Memories | Chad Graham | November 12, 2019 | |
| Memories | Joseph Vincent & Jason Chen | November 15, 2019 | |
| Memories | Conkarah | November 26, 2019 | |
| Memories | Ray Lorraine | December 5, 2019 | Acoustic |

<https://secondhandsongs.com>


Original songs and cover songs info


lost.fm

Maroon 5

ON TOUR




PLAY ARTIST 4.5M 155.7M

LATEST RELEASE  **Overexposed (Deluxe)** [C...]
21 April 2022

POPULAR THIS WEEK  **Payphone**
21,995 listeners

Join others and track this artist
Scorable, find and rediscover music with a Last.fm account

SHOW UP TO LAST.FM

Similar To   

View all artists


Maroon 5 is an American pop rock band that originated in Los Angeles, California, United States. The group was formed in 1994 as Kara's Flowers while its members were still in high school and originally consisted of Adam Levine (lead vocals, guitar), Jesse Carmichael (guitar, backing vocals), Mickey Madden (bass guitar) and Ryan Dusick (drums). Kara's Flowers released one album, *Maroon*, in 1997.

Years Active 2002 – present (20 years)
Founded In Los Angeles, Los Angeles County, California, United States

pop pop rock rock alternative maroon 5

External Links

 www.maroon5.com

 [Twitter \(@maroon5\)](https://twitter.com/maroon5)

 [Facebook \(maroon5\)](https://facebook.com/maroon5)

 [SoundCloud](https://soundcloud.com/maroon5)

 [Instagram](https://www.instagram.com/maroon5)

<https://www.last.fm/>

Singers info



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

Songs with awards won/nominated

Data Acquisition



More than **15 hours** spent for data crawling.

<https://secondhandsongs.com>

- 10 000+ original songs
- 100 000+ cover songs

(title, release date, original/cover song, writers, singers, number of covers,..)

<https://www.last.fm/>

- Around 10 000 singers

(title, birthplace, birthdate, homepage url, twitter url, facebook url, instagram url)



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

- Around 300 songs with awards

(title, award year)

Entity Resolution

Secondhandsong

| |
|---------------------|
| Song Name |
| Singer/Coverer Name |
| Release Date |
| ... |

Last.fm

| |
|--------------------|
| Song Name |
| Singer Name |
| Release Date |
| Singer Born Place |
| Singer Music Genre |
| ... |



Entity Resolution

Secondhandsong

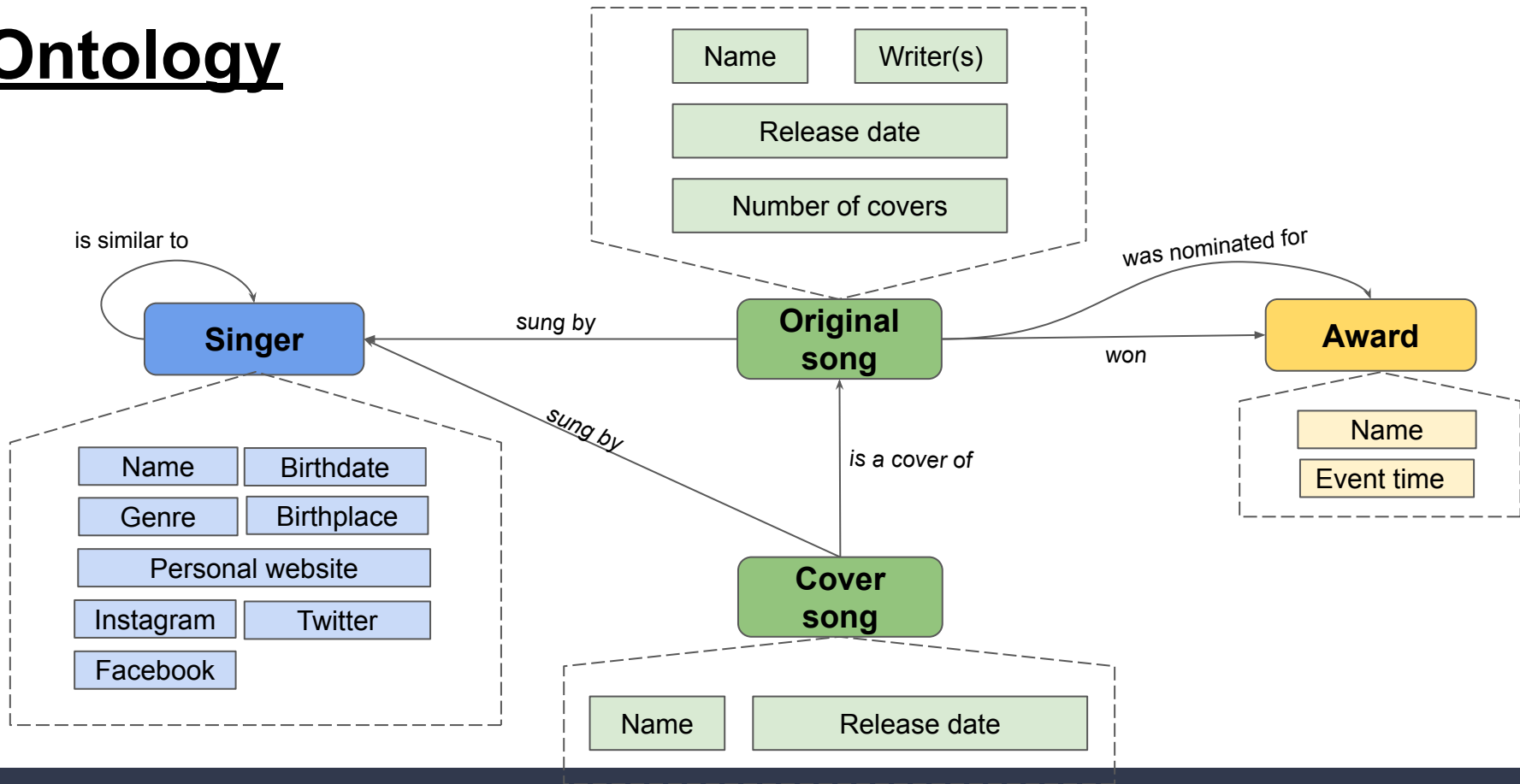
| |
|---------------------|
| Song Name |
| Singer/Coverer Name |
| Release Date |
| ... |



wikidata

| |
|------------|
| Song Name |
| Award Name |
| Date |

Ontology



KG Construction



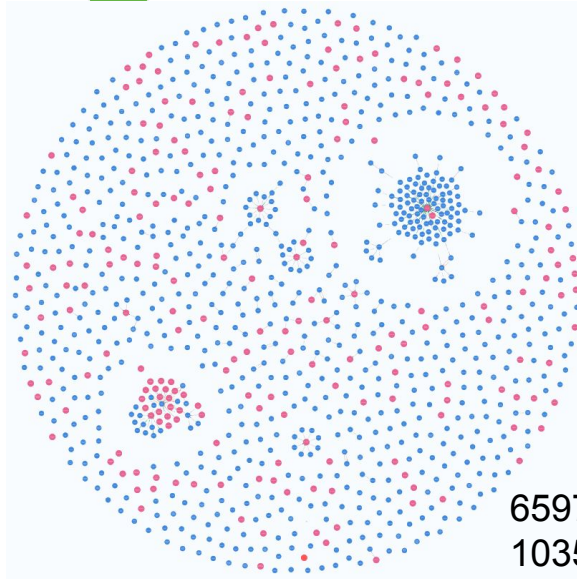
neosemantics



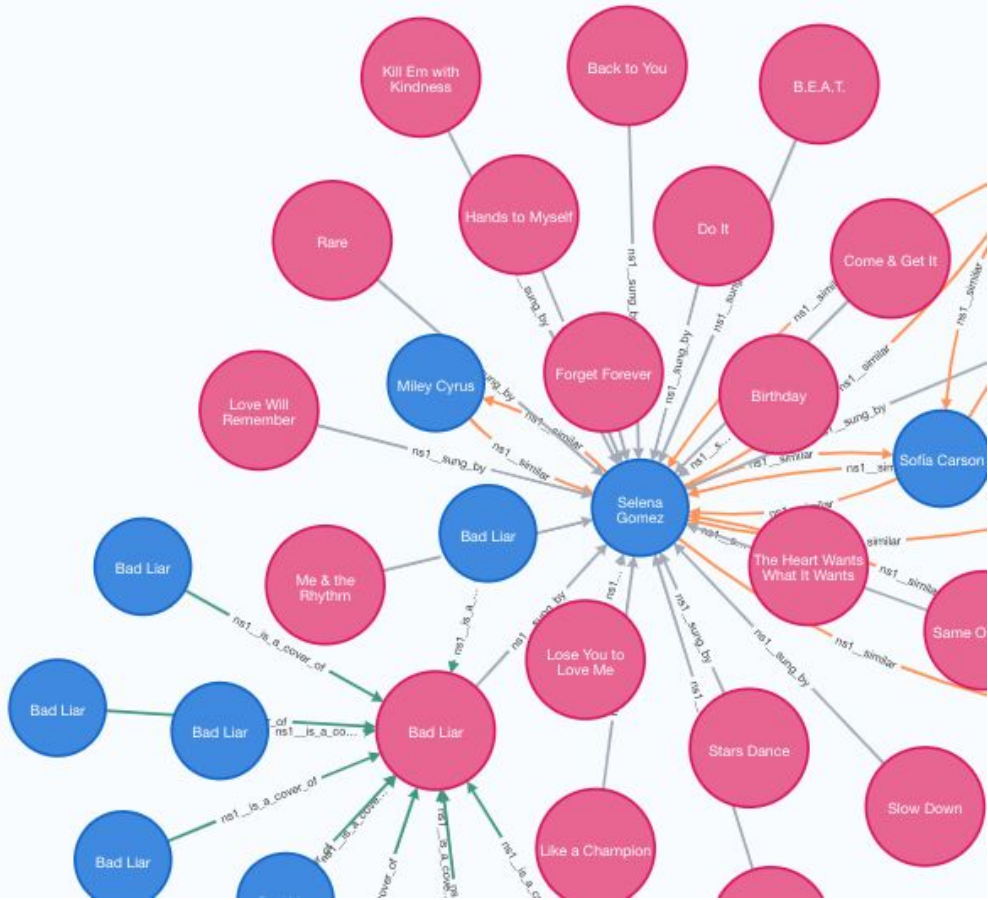
```
@prefix dc: <http://purl.org/dc/elements/1.1/> .
@prefix ex: <http://dsci558.org/myprojectnamespace#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix schema: <https://schema.org/> .
@prefix wiki: <https://wikidata.org/> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

ex:A_Happy_Thought8441_original a schema:original_song ;
  dc:sung_by ex:Kurt_Elling_featuring_Stu_Mindeman ;
  rdfs:covers 0 ;
  rdfs:has_writers "Stu Mindeman"@en ;
  rdfs:release_date "2018-03-23"^^xsd:date ;
  rdfs:title "A Happy Thought"@en .

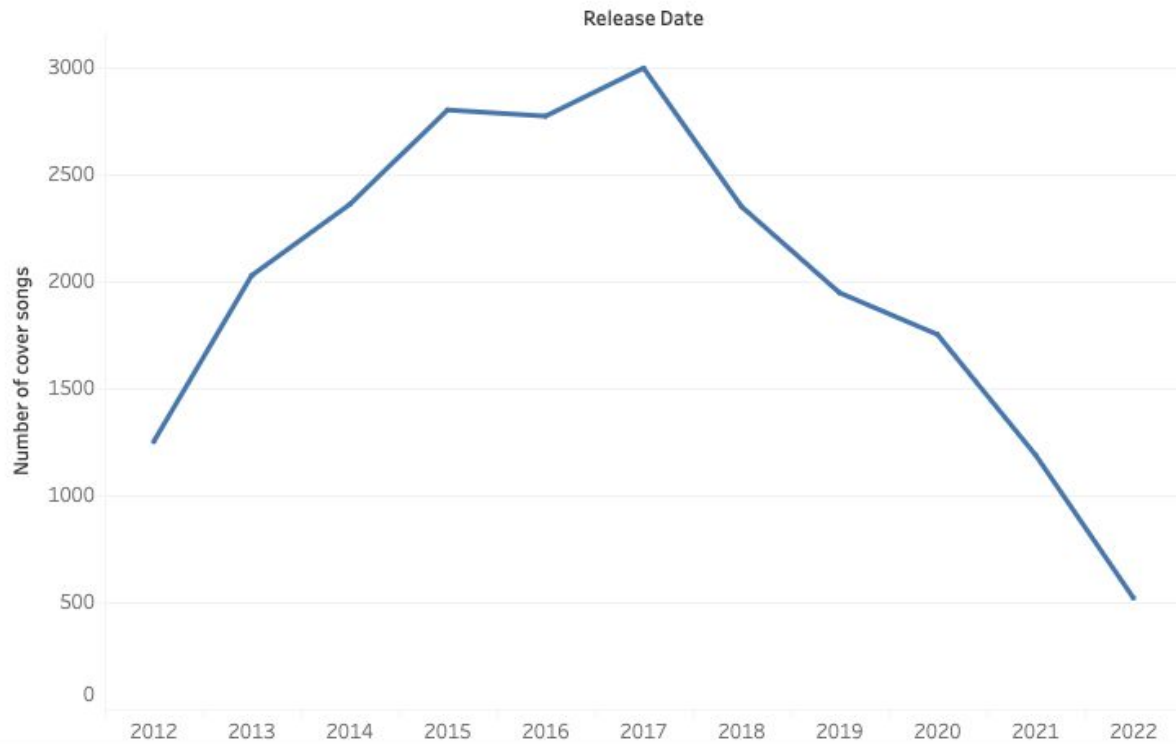
ex:A_Million_Dreams4503 a schema:cover_song ;
  dc:is_a_cover_of ex:A_Million_Dreams128_original ;
  dc:sung_by ex:Lucy_Thomas ;
  rdfs:release_date "2019-08-16"^^xsd:date ;
  rdfs:title "A Million Dreams"@en .
```



65974 nodes
103591 relationships

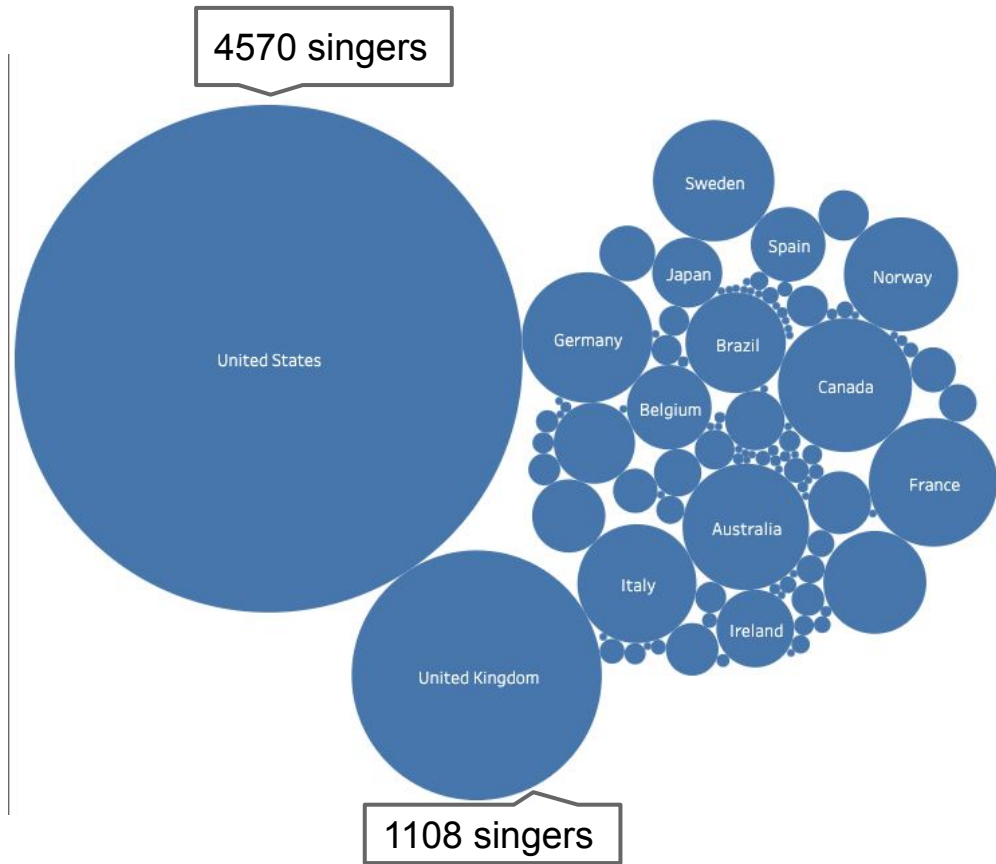


Data Analysis

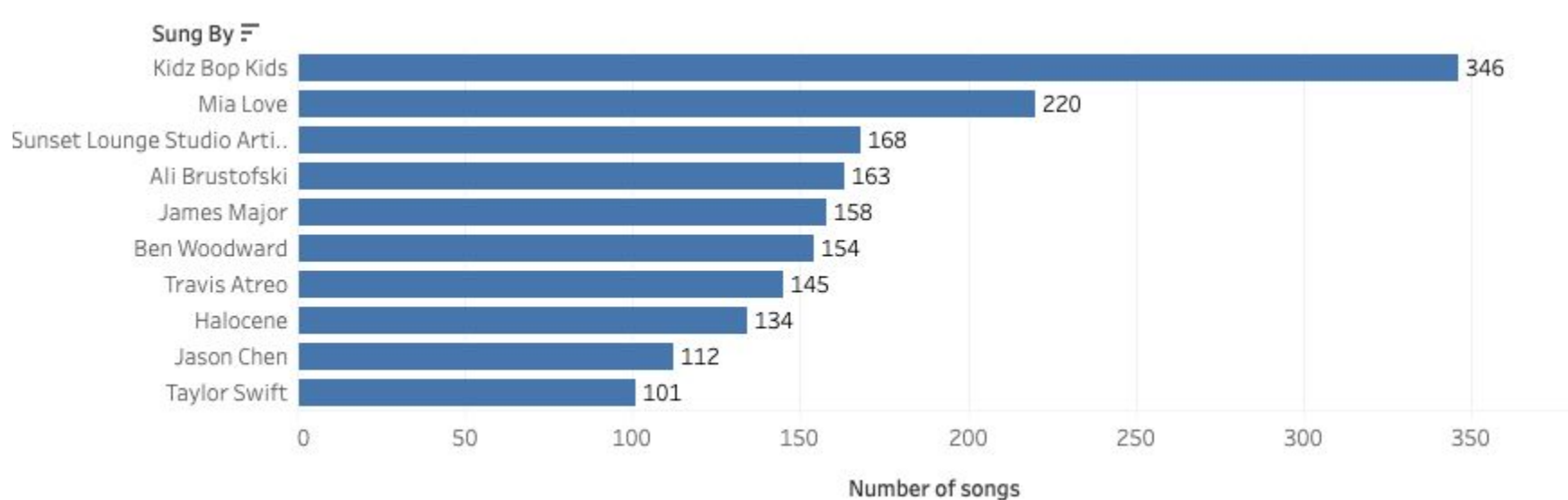


Data Analysis

Among 9000 singers, the number of US singers takes up more than half.



Data Analysis



Technical Challenge - Data Collection

ORIGINAL

Carrie Anne *by* The Hollies



Added by Limbabwe

Written by
Language
Released on

Allan Clarke, Tony Hicks, Graham Nash
English



Carrie Anne
Single
May 26, 1967

Comments
Licensing

#3 in the UK and #9 in the US
[Request a synchronization license](#)

Data Consistency

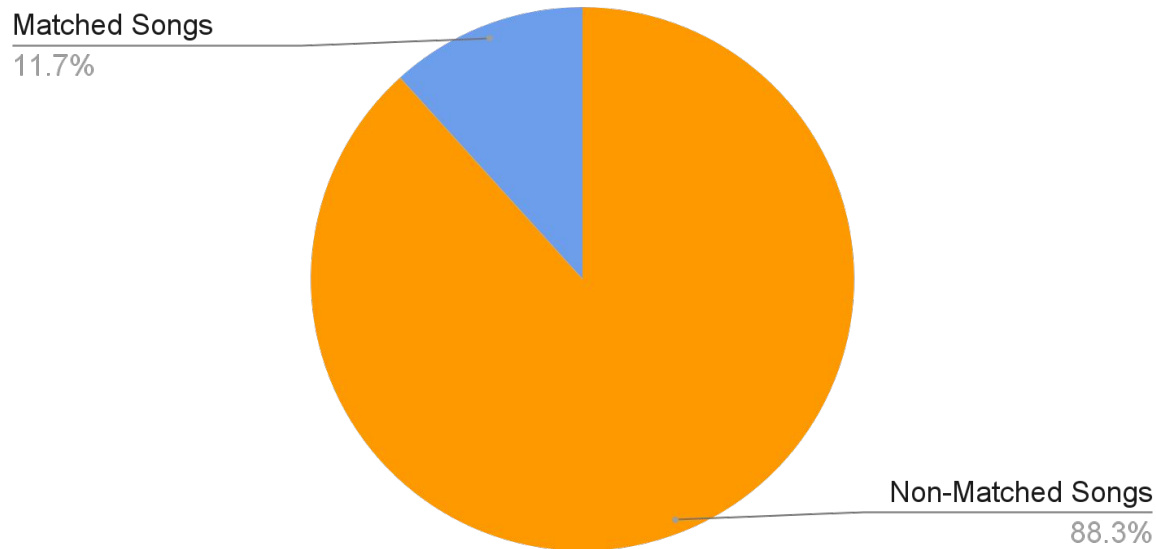


Dynamic Web Scraping



Technical Challenge - Entity Resolution

- Among 145 nominated songs in wikidata, 17 songs from secondhandsong were matched

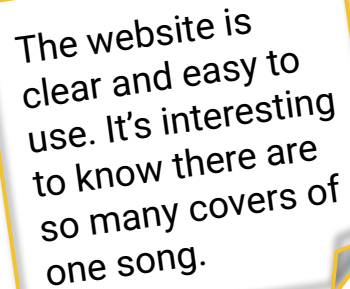


Technical Challenge - Webapp Building

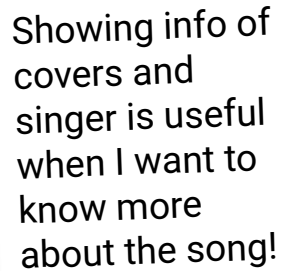


Validation

- We invited 15 users to test our website to confirm the utility.
- Users were asked to search songs by title, singer, and year.
- The feedback was positive and able to satisfy the need of song searching.



The website is clear and easy to use. It's interesting to know there are so many covers of one song.



Showing info of covers and singer is useful when I want to know more about the song!



Good design.
User friendly website.
Adding events info may be better.

Website Demo

ADSC

Overview

Our Work

KG Query

Contact Us

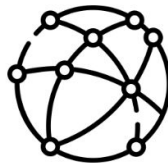
A Decade of Song Covers

A knowledge graph searching engine for **over 30,000** cover songs in time period from **2012 to 2022**.

Overview

A Decade of Song Covers contains information about cover songs and the related information like original song and performers. It aims to help people explore music. Data resources include [Secondhandsongs](#), [Last.fm](#), and [wikidata](#). There are over 30,000 songs in the database.

Our Work



Ontology

Explore



Neo4j Query

Explore



Data Analysis

Explore

Website Demo

KG Query

Title

Singer

Year

Singer: The Weeknd

rnb

Brith Date: February 16, 1990

f

ig

globe

Singer/Cover

Search Now

| Song | Singer/Cover | Released Date | Writer | Award |
|--------------------------------|--------------------------------|---------------|-----------------|-------|
| Save Your Tears | Save Your Tears | 2020-03-20 | Max Martin [SE] | |
| Hardest to Love | Hardest to Love | 2020-03-20 | Max Martin [SE] | |
| In Your Eyes | In Your Eyes | 2020-03-20 | Max Martin [SE] | |
| After Hours | After Hours | 2020-02-19 | Mario Winans | |
| Warriors | Warriors | 2020-03-18 | | |
| The Bones | The Bones | 2020-07-31 | | |
| I Got So High That I Saw Jesus | I Got So High That I Saw Jesus | 2020-03-20 | Noah Cyrus | |
| Young and Sad | Young and Sad | 2020-05-15 | Noah Cyrus | |
| Juice | Juice | 2020-04-26 | | |
| Lose Control | Lose Control | 2020-04-19 | | |

| Song title | type | Release date | singer | writer | award |
|------------|----------|--------------|--------|--------|-------|
| | original | | | | |
| | cover | | | | |
| | | | | | |



ADSC

THANK YOU FOR LISTENING!

Some transition fillers: moving on, next,

- Title ROLEPLAY!! - 1
- Motivation -1
- Methodology - 1
- Crawling/Data Aquisition - selenium, how many hours scraping run -2
- V Entity Resolution, EL yield F1, recall, precision (2)
- Ontology (KG Construction) (2)
- Data Analysis (3)
- Technical challenge - selenium, wiki award matching, ontology creation, flask+neo4j (4)
- Validation, right results shown after querying, ask people to test our website and get feedback -1
- Website demo - overall layout, query table - 2
- Project Links ROLEPLAY ENDING - 1

* Future work?

* Add tools used whenever suit

* Automated 20s per slide

Course Presentation Rubric

Were visual aids used throughout the presentation to support the major ideas?

Did the presenters speak clearly?

Did the presenters effectively budget their time?

Did the presentation clearly motivate the problem / KG?

- Clear motivation for the project with examples/images
- Motivation mentioned, but not very clear or explained
- Motivation unclear or barely covered

Did the presentation effectively convey the data used?

- Clear slide(s) showing data with examples/images
- Slide(s) with data listed out, but not supported by examples/images
- Unclear, Data sources scattered throughout presentation

Did the presentation effectively convey the ontological classes/relations, extraction, entity resolution/linking used?

- Clear slide(s) explaining ontology design, extraction approach, and entity linking or resolution
- Slide(s) describe 1-2 of ontology/extraction/ER and lack specificity
- Unclear, not described in enough detail to understand approach

Was the approach to the first technical challenge clearly explained?

- Presentation conveys the problem, examples, solution, and evaluation
- Presentation covers 2-3 of problem, examples, solution, and evaluation
- Presentation covers problem, examples, solution, or evaluation

Was the approach to the second technical challenge clearly explained? (Or re-use previous score if 1st challenge was significant)

- Presentation conveys the problem, examples, solution, and evaluation
- Presentation covers 2-3 of problem, examples, solution, and evaluation
- Presentation covers problem, examples, solution, or evaluation

Did the project assess the quality of the KG in any way?

- Clear explanation of evaluation of KG, rigorous results
- Vague explanation of evaluation, no results
- Did not evaluate

Did the presentation show analytics, visualization, or query of the KG?

- One or more visualizations of KG/query aligned with use case, easy to read/see
- Visualization that was ineffective or not aligned with motivation
- No visualization or query