You Belong Together

Detecting Linked Accounts at Ricardo

By Tobias Kaymak

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Data Engineering

Data Science

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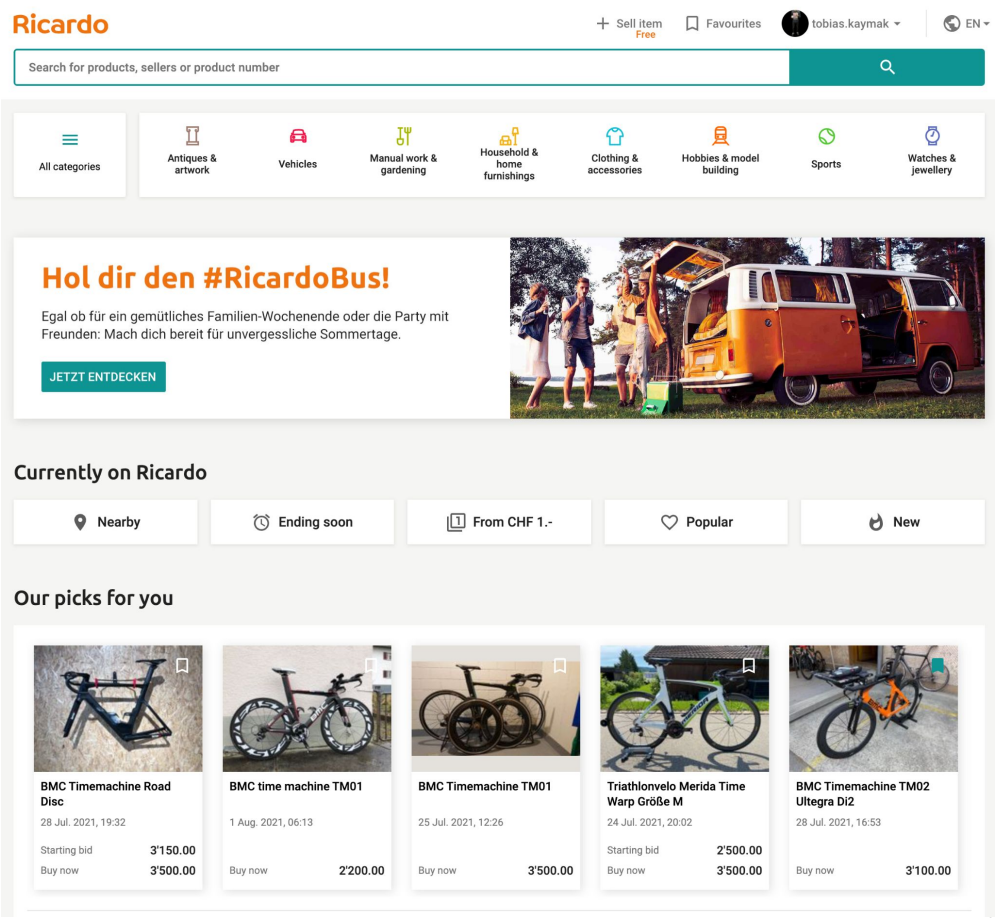
Ricardo



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Are the Olson Twins...

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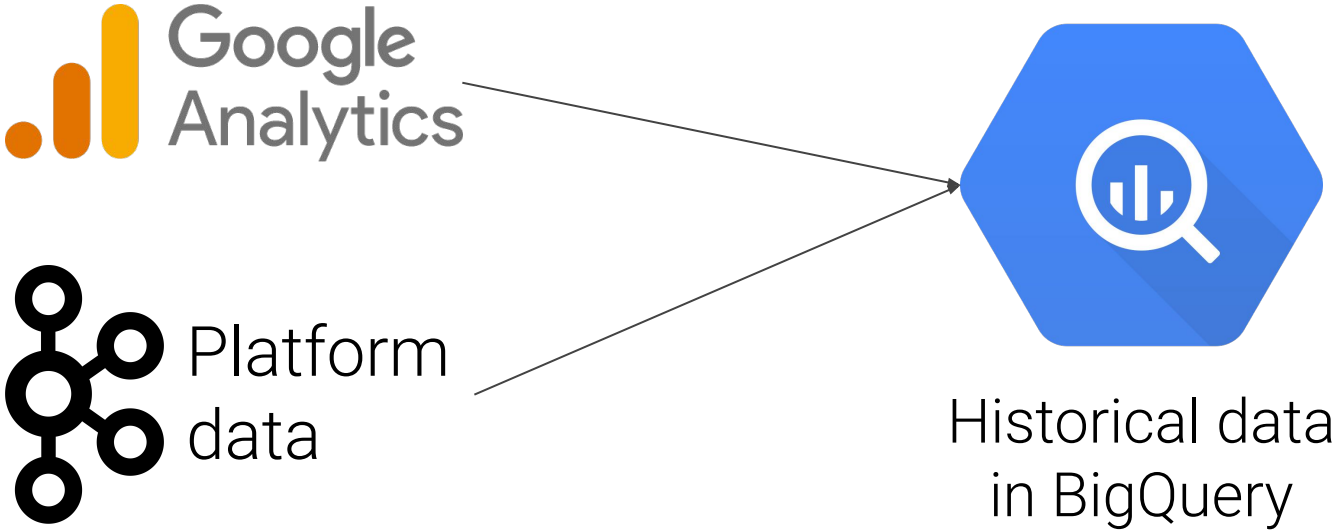
...the same person?

Data Sources



Switzerland is a multi-language country

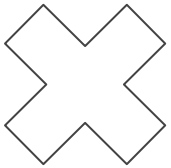
Fuzzy String Matching

Quellgasse

Quellgase

Quelgasse

...



Quellgasse

Quellgase

Quelgasse

...

Fuzzy String Matching

n ✕ **n-1**

Phonetic Algorithms

Quellgase

Quellgasse Quelgasse

Cologne phonetics

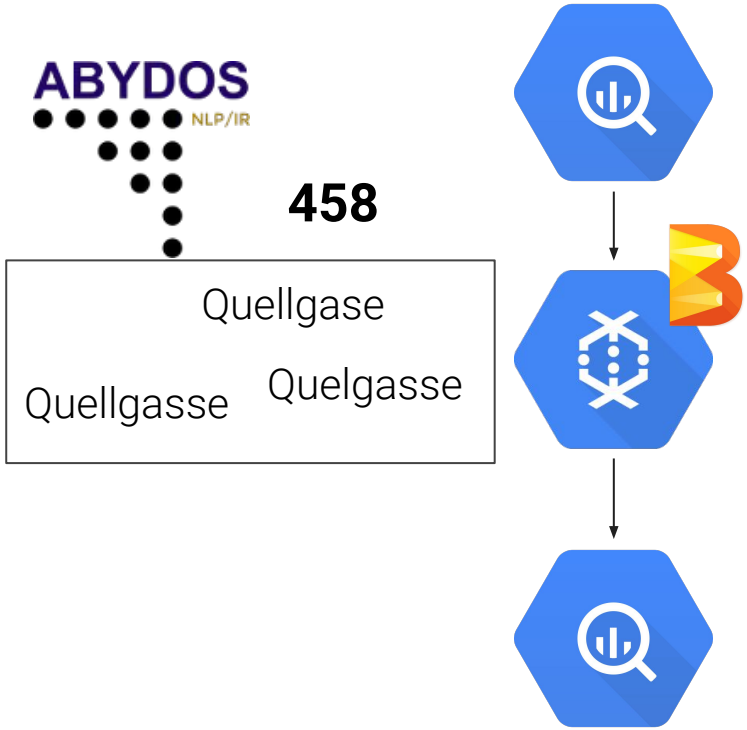
Cologne phonetics

458

Quellgase

Quellgasse Quelgasse

Can we solve it with Python?




```
with beam.Pipeline() as p:
    p
    | "Read data" >> beam.io.ReadFromBigQuery()

    | "Encode phonetic" >> beam.FlatMap(enc_values)
    | "Group per phonetic key" >> beam.GroupByKey()
    | "Match values" >> beam.FlatMap(match_values)
    | "Group per customerNr" >> beam.GroupByKey()
    | "Convert to BigQuery rows" >> beam.Map(to_row)

    | "Write result" >> beam.io.WriteToBigQuery()
```

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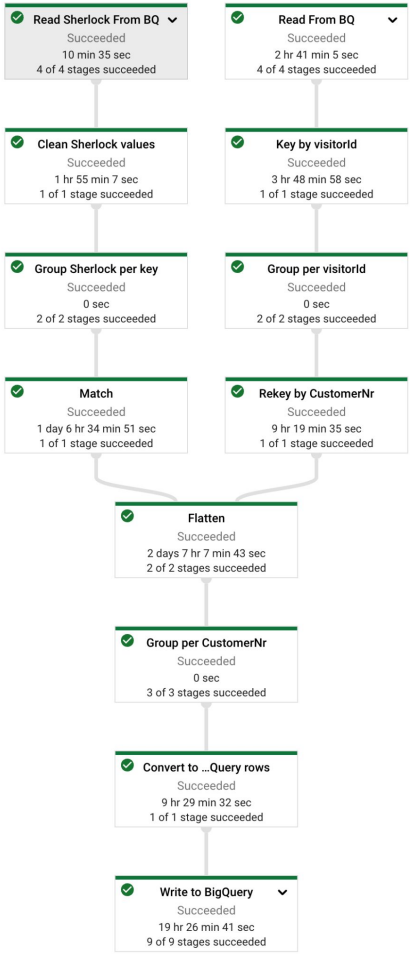
python
TM


Read Sherlock From BQ
Succeeded
10 min 35 sec
4 of 4 stages succeeded
Read From BQ
Succeeded
2 hr 41 min 5 sec
4 of 4 stages succeeded
Clean Sherlock values
Succeeded
1 hr 55 min 7 sec
1 of 1 stage succeeded
Key by visitorId
Succeeded
3 hr 48 min 58 sec
1 of 1 stage succeeded
Group Sherlock per key
Succeeded
0 sec
2 of 2 stages succeeded
Group per visitorId
Succeeded
0 sec
2 of 2 stages succeeded
Match
Succeeded
1 day 6 hr 34 min 51 sec
1 of 1 stage succeeded
Rekey by CustomerNr
Succeeded
9 hr 19 min 35 sec
1 of 1 stage succeeded
Flatten
Succeeded
2 days 7 hr 7 min 43 sec
2 of 2 stages succeeded
Group per CustomerNr
Succeeded
0 sec
3 of 3 stages succeeded
Convert to ...Query rows
Succeeded
9 hr 29 min 32 sec
1 of 1 stage succeeded
Write to BigQuery
Succeeded
19 hr 26 min 41 sec
9 of 9 stages succeeded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So are they the same person?

The Beam Python Experience is Fun

The Price of Context Switching?

Data Engineering

Data Science

Lessons learned

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Lessons learned

```
--experiments=use_runner_v2

--flexrs_goal=COST_OPTIMIZED
```

Thank you ❤️

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References

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- https://beam.apache.org/documentation/dsls/dataframes/overview/
- https://issues.apache.org/jira/browse/BEAM-11998
- https://issues.apache.org/jira/browse/BEAM-11993
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- https://cloud.google.com/composer/docs/how-to/using/using-dataflow-template-operator

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