U. PORTO

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Information Processing and Retrieval

Master in Informatics Engineering and Computation at FEUP, U.Porto

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Information Retrieval Tools

- Near Real-Time Indexing
- Flexible and Adaptable with easy configuration
- Comprehensive Administration Interfaces
- Standards Based Open Interfaces - XML, JSON and HTTP
- Advanced Full-Text Search Capabilities

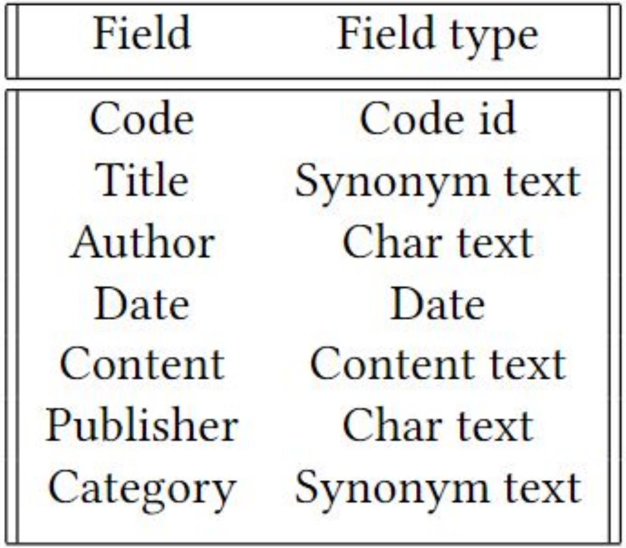
Collection

- startup.sh builds docker image with 1 core
- schema.sh creates the schema for the news collection via API
- populate.sh script populates the core with the json file content

Indexing - Schema

Filters:

- ASCII Folding Filter
- Lower Case Filter
- Mapping Char Filter
- Synonym Graph Filter
- Porter Stem Filter
- English Possessive Filter
- Hyphenated Words Filter
- Stop filter



Field	Field type
Code	Code id
Title	Synonym text
Author	Char text
Date	Date
Content	Content text
Publisher	Char text
Category	Synonym text

Retrieval

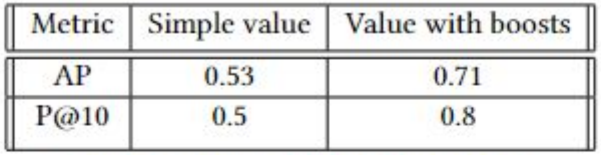
- **Fields boosts:** enhance the relevance of specific fields.
- **Term boosts**: elevate the importance of certain words.
- **Proximity searches**: emphasizes the closeness of terms.
- **Wildcards/Fuzziness**: allows for flexibility in matching variations of a term

Evaluation

- Metrics:
  - Average Precision (AP)
  - Precision at 10 (P@10)
- Manual construction of qrels.txt files.

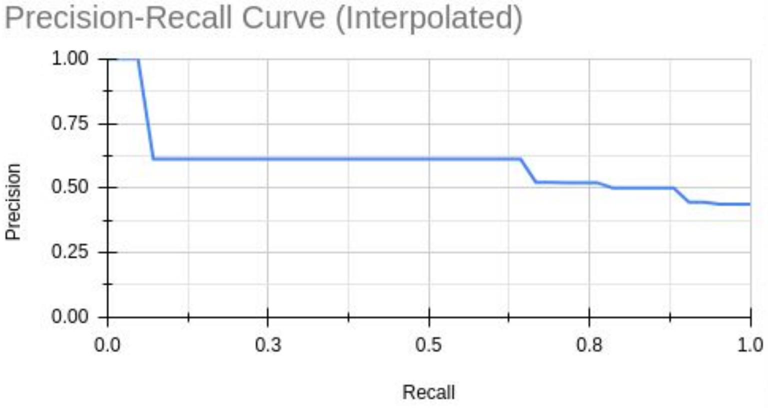
Evaluation - Query 1

Find news articles where Trump spoke on the immigration crisis

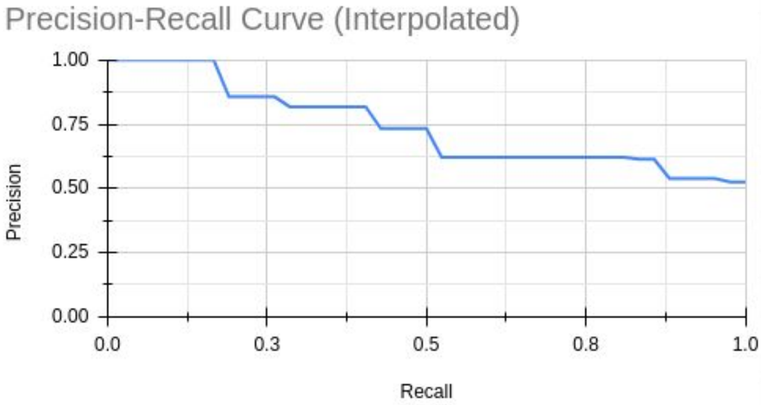


Metric	Simple value	Value with boosts
AP	0.53	0.71
P@10	0.5	0.8

Table 3: Precision metrics for Q1



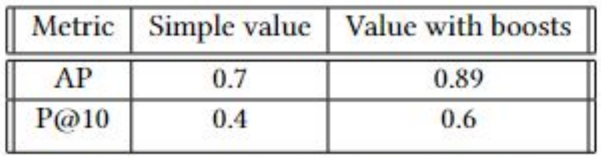
(simple schema without boosts)



(improved schema with boosts)

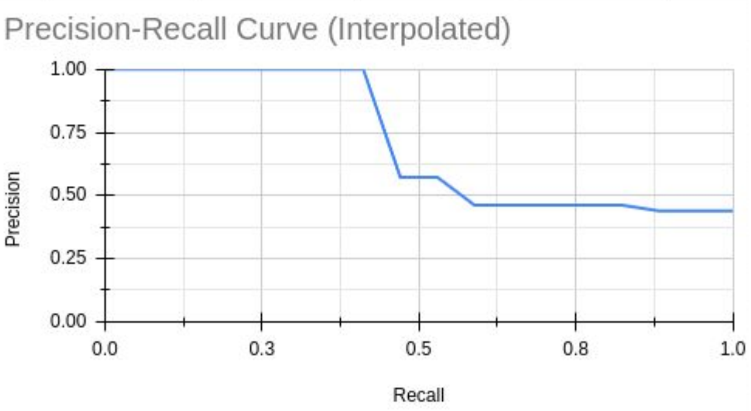
Evaluation - Query 2

Find news about LeBron's good performances in games his team won

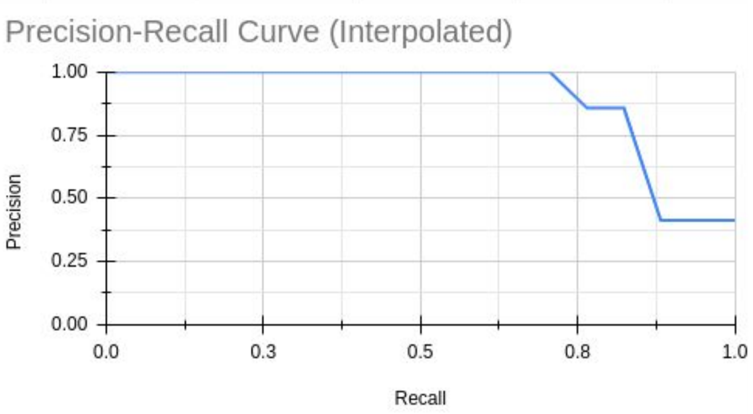


Metric	Simple value	Value with boosts
AP	0.7	0.89
P@10	0.4	0.6

Table 5: Precision metrics for Q2



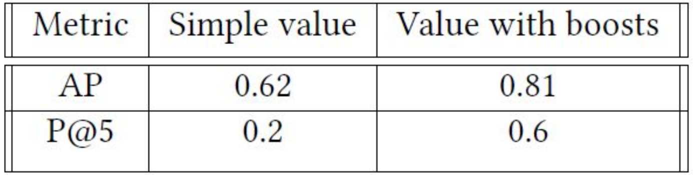
(simple schema without boosts)



(improved schema with boosts)

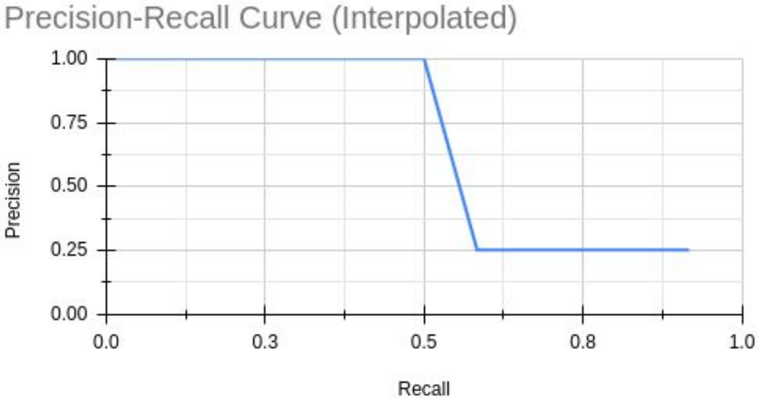
Evaluation - Query 3

Find articles related to homicides investigated by the FBI in 2017



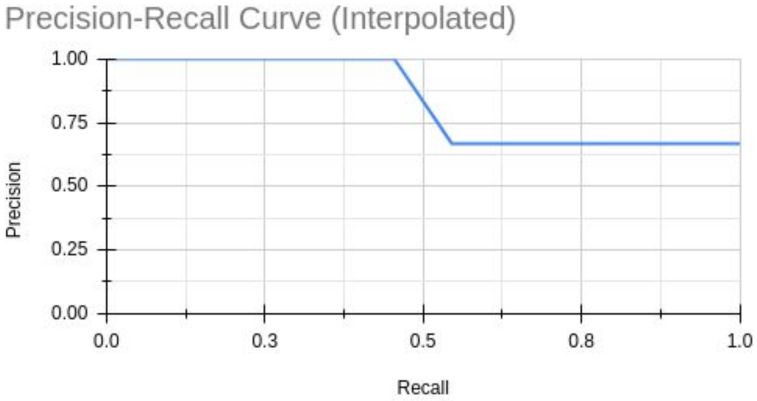
Metric	Simple value	Value with boosts
AP	0.62	0.81
P@5	0.2	0.6

Table 7: Precision metrics for Q3



Precision-Recall Curve (Interpolated)

(simple schema without boosts)

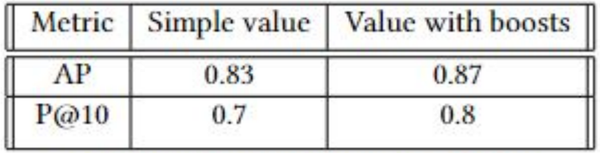


Precision-Recall Curve (Interpolated)

(improved schema with boosts)

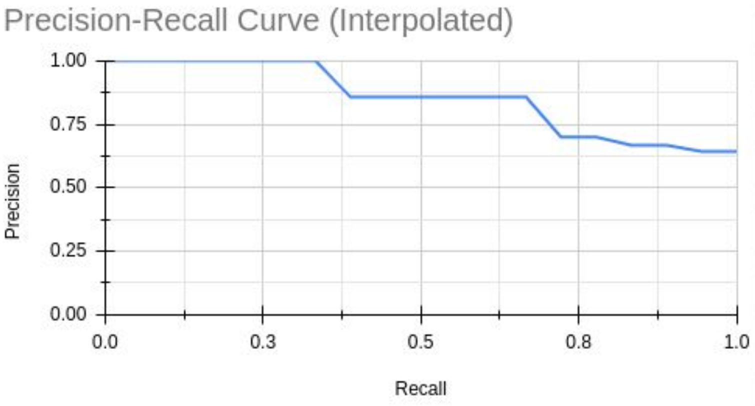
Evaluation - Query 4

Find news articles regarding the conflicts between republicans and democrats about gun ownership

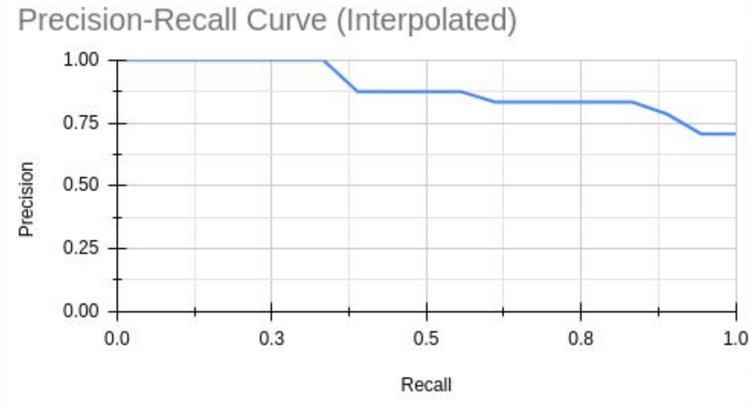


Metric	Simple value	Value with boosts
AP	0.83	0.87
P@10	0.7	0.8

Table 9: Precision metrics for Q4



(simple schema without boosts)



(improved schema with boosts)