M.EIC PRI 2022/2023 G55

arXiv - Scientific Papers

Scientific Articles Search System

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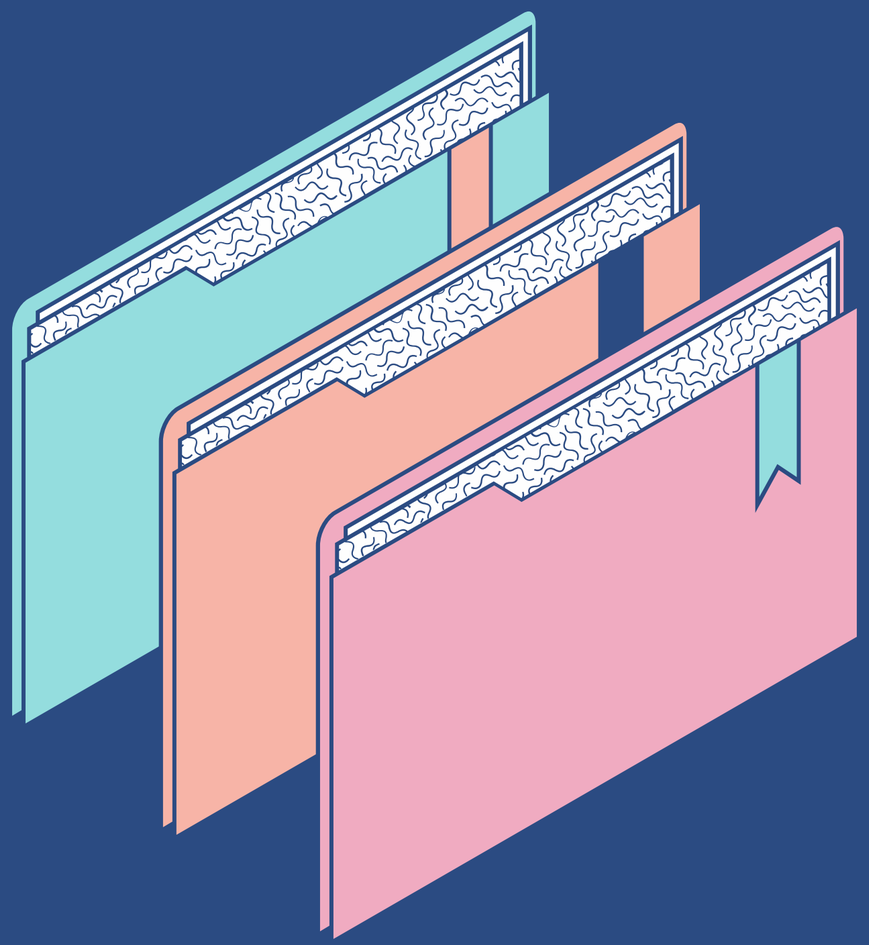


Dataset

kaggle

Solr

JSON

Collection of scientific papers and their corresponding information from the website ARXIV

Collection

A paper defines a document which has the paper's information.

Most relevant fields:

- Title
- Summary
- Authors
- Areas
- Fields
- Subjects

Collection


```
{
  "link":["http://arxiv.org/abs/1606.02518v3"],
  "summary":"The multivariate normal density is a monotonic function of the distance to\nthe mean, and its ellipsoidal shape is due to the underlying Euclidean metric.\nWe suggest to repla
  "title":"A Locally Adaptive Normal Distribution",
  "authors":["Georgios Arvanitidis",
    "Lars Kai Hansen",
    "Søren Hauberg"],
  "date":"2016-06-08T00:00:00Z",
  "areas":["Statistics"],
  "fields":["Statistics"],
  "subjects":["Machine Learning"],
  "id":"22413",
  "_version_":1749478622659346433},
{
```

Indexing

Tokenizer:

ClassicTokenizerFactory

Filters:

ClassicFilterFactory
LowerCaseFilterFactory
ASCIIFoldingFilterFactory
PorterStemFilterFactory
StopFilterFactory
PhoneticFilterFactory
RemoveDuplicatesTokenFilterFactory
SynonymGraphFilterFactory
CommonGramsFilterFactory
BeiderMorseFilterFactory

Type	Fields	Indexed
titleType	Title	Yes
summary (personalized)	Sumamry	
names (personalized)	Authors, Areas, Fields, Subjects, Date	
date	Date	

Query 1

I am a developer creating a ML model to predict cars longevity based on their velocity.

Query 1

Query:

q: velocity
qf: link summary title authors date areas fields subjects
defType: edismax

Boosted:

q: velocity
qf: link summary^10 title^2 authors date areas fields subjects
defType: edismax

Query 1 - results boosted


```
{
  "link":["http://arxiv.org/abs/1802.07094v1"],
  "summary":"This paper documents the winning entry at the CVPR2017 vehicle velocity\nestimation challenge. Velocity estimation is an emerging
  "title":"Camera-based vehicle velocity estimation from monocular video",
  "authors":["Moritz Kampelmühler",
    "Michael G. Müller",
    "Christoph Feichtenhofer"],
  "date":"2018-02-20T00:00:00Z",
  "areas":["Computer Science"],
  "fields":["Computer Science"],
  "subjects":["Computer Vision and Pattern Recognition"],
  "id":"31202",
  "_version_":1749494417606049792},
{
  "link":["http://arxiv.org/abs/1705.09805v3"],
  "summary":"We propose position-velocity encoders (PVEs) which learn---without\nsupervision---to encode images to positions and velocities of
  "title":"PVEs: Position-Velocity Encoders for Unsupervised Learning of Structured\n  State Representations",
  "authors":["Rico Jonschkowski",
    "Roland Hafner",
    "Jonathan Scholz",
    "Martin Riedmiller"],
  "date":"2017-05-27T00:00:00Z",
  "areas":["Computer Science"],
  "fields":["Computer Science"],
  "subjects":["Robotics",
    "Computer Vision and Pattern Recognition",
    "Machine Learning"],
  "id":"12804",
  "_version_":1749493970372657152},
```

Query 1 - analysis

	Non-boosted	Boosted
Precision	1.0	1.0
Recalls	1.0	1.0

Query 2

I am a data analyst that is processing a dataset and I need to understand normal distributions.

Query 2

Query:

q: normal distribution
qf: link summary title authors date areas fields subjects
defType: edismax

Boosted:

q: normal distribution
qf: link summary^2 title^10 authors date areas fields subjects
bq: areas:Statistics^10
defType: edismax

Query 2 - results boosted


```
{
  "link":["http://arxiv.org/abs/1606.02518v3"],
  "summary":"The multivariate normal density is a monotonic function of the distance to\nthe mean, and its ellipsoidal shape is due
  "title":"A Locally Adaptive Normal Distribution",
  "authors":["Georgios Arvanitidis",
    "Lars Kai Hansen",
    "Søren Hauberg"],
  "date":"2016-06-08T00:00:00Z",
  "areas":["Statistics"],
  "fields":["Statistics"],
  "subjects":["Machine Learning"],
  "id":"22413",
  "_version_":1749494197137702912},
{
  "link":["http://arxiv.org/abs/1103.4789v3"],
  "summary":"We present the discrete infinite logistic normal distribution (DILN), a\nBayesian nonparametric prior for mixed members
  "title":"The Discrete Infinite Logistic Normal Distribution",
  "authors":["John Paisley",
    "Chong Wang",
    "David Blei"],
  "date":"2011-03-24T00:00:00Z",
  "areas":["Statistics"],
  "fields":["Statistics"],
  "subjects":["Machine Learning"],
  "id":"21576",
  "_version_":1749494175382896640},
{
```

Query 2 - analysis

	Non-boosted	Boosted
Precision	0.5	1.0
Recalls	0.625	0.9375

Query 3

I am a writer that wants to write a biography about Francis Bach, but I want to focus on his algorithmic work from 2008 until 2018 mostly, preferably from the year of 2015.

Query 3

Query:

q: Francis Bach algorithm
fq: date:[2014-01-01T00:00:00Z TO 2018-01-01T00:00:00Z}
qf: link summary title authors date areas fields subjects
defType: edismax

Boosted:

q: Francis Bach algorithm
qf: link summary^5 title authors^5 date areas fields subjects
fq: date:[2014-01-01T00:00:00Z TO 2018-01-01T00:00:00Z}
bf: if(and(gte(ms(date),ms(2015-01-01T00:00:00Z)),lt(ms(date),ms(2016-01-01T00:00:00Z))),10,0.1)
defType: edismax

Query 3 - results boosted


```
{
  "link":["http://arxiv.org/abs/1506.04908v3"],
  "summary":"We study supervised learning problems using clustering constraints to impose\nstructure on either features or samples, seeking t
  "title":"Learning with Clustering Structure",
  "authors":["Vincent Roulet",
    "Fajwel Fogel",
    "Alexandre d'Aspremont",
    "Francis Bach"],
  "date":"2015-06-16T00:00:00Z",
  "areas":["Computer Science"],
  "fields":["Computer Science"],
  "subjects":["Machine Learning"],
  "id":"32772",
  "_version_":1749494456557502464},
{
  "link":["http://arxiv.org/abs/1503.01563v1"],
  "summary":"Energy minimization has been an intensely studied core problem in computer\nvision. With growing image sizes (2D and 3D), it is
  "title":"Convex Optimization for Parallel Energy Minimization",
  "authors":["K. S. Sesh Kumar",
    "Alvaro Barbero",
    "Stefanie Jegelka",
    "Suvrit Sra",
    "Francis Bach"],
  "date":"2015-03-05T00:00:00Z",
  "areas":["Computer Science",
    "Mathematics"],
  "fields":["Computer Science",
    "Mathematics"],
  "subjects":["Computer Vision and Pattern Recognition",
    "Optimization and Control"],
  "id":"38998",
  "_version_":1749494613143453696},
{
```

Query 3 - analysis

	Non-boosted	Boosted
Precision	0.9	1.0
Recalls	0.9333	0.9333

Query 4

I am a researcher that wants to try some some new approaches related to my case study in linguistics.

Query 4

Query:

q: areas:(statistics) new approaches linguistics
qf: link summary title authors date areas fields subjects
defType: edismax

Boosted:

q: areas:(statistics) new approaches linguistics
qf: link summary title^2 authors date areas fields subjects
pf: title^10
defType: edismax

Query 4 - results boosted


```
{
  "link":["http://arxiv.org/abs/1411.3315v1"],
  "summary":"We propose a new computational approach for tracking and detecting\nstatistically significant linguistic shifts in the meaning and usage of wor
  "title":"Statistically Significant Detection of Linguistic Change",
  "authors":["Vivek Kulkarni",
    "Rami Al-Rfou",
    "Bryan Perozzi",
    "Steven Skiena"],
  "date":"2014-11-12T00:00:00Z",
  "areas":["Computer Science"],
  "fields":["Computer Science"],
  "subjects":["Computation and Language",
    "Information Retrieval",
    "Machine Learning"],
  "id":"9147",
  "_version_":1749493871850553344},
{
  "link":["http://arxiv.org/abs/1302.2569v1"],
  "summary":"We propose a new statistical model for computational linguistics. Rather than\ntrying to estimate directly the probability distribution of a ra
  "title":"Toric grammars: a new statistical approach to natural language modeling",
  "authors":["Olivier Catoni",
    "Thomas Mainguy"],
  "date":"2013-02-11T00:00:00Z",
  "areas":["Statistics",
    "Computer Science",
    "Mathematics"],
  "fields":["Statistics",
    "Computer Science",
    "Mathematics"],
  "subjects":["Machine Learning",
    "Computation and Language",
    "Probability"],
  "id":"8989",
  "_version_":1749493867142447104},
{
```

Query 4 - analysis

	Non-boosted	Boosted
Precision	0.5	0.6
Recalls	0.454545	1.0

Query 5

I am a student that wants to get all the papers related to economics and computer science, in the year of 2017.

Query 5

Query:

q: Computer Science economics
fq: date:[2017-01-01T00:00:00Z TO 2018-01-01T00:00:00Z}
qf: link summary title authors date areas fields subjects
defType: edismax

Boosted:

q: Computer Science economics
fq: date:[2017-01-01T00:00:00Z TO 2018-01-01T00:00:00Z}
qf: link summary title authors date areas^5 fields^5 subjects^5
defType: edismax

Query 5 - results boosted


```
{
  "link":["http://arxiv.org/abs/1701.08567v2"],
  "summary":"As we know, there is a controversy about the decision making under risk\nbetween economists and psychologists. We discuss to build a unified theory of\nrisky
  "title":"Decision structure of risky choice",
  "authors":["Lamb Wubin",
    "Naixin Ren"],
  "date":"2017-01-30T00:00:00Z",
  "areas":["Quantitative Finance",
    "Computer Science"],
  "fields":["Quantitative Finance",
    "Computer Science"],
  "subjects":["Economics",
    "Artificial Intelligence"],
  "id":"37267",
  "_version_":1749494566415761408},
{
  "link":["http://arxiv.org/abs/1702.02896v2"],
  "summary":"We consider the problem of using observational data to learn treatment\nassignment policies that satisfy certain constraints specified by a\npractitioner, suc
  "title":"Efficient Policy Learning",
  "authors":["Susan Athey",
    "Stefan Wager"],
  "date":"2017-02-09T00:00:00Z",
  "areas":["Mathematics",
    "Computer Science",
    "Economics",
    "Statistics"],
  "fields":["Mathematics",
    "Computer Science",
    "Economics",
    "Statistics"],
  "subjects":["Statistics Theory",
    "Machine Learning",
    "Econometrics",
    "Machine Learning",
    "Statistics Theory"],
  "id":"13127",
  "_version_":1749493979506802688},
{
```

Query 5 - analysis

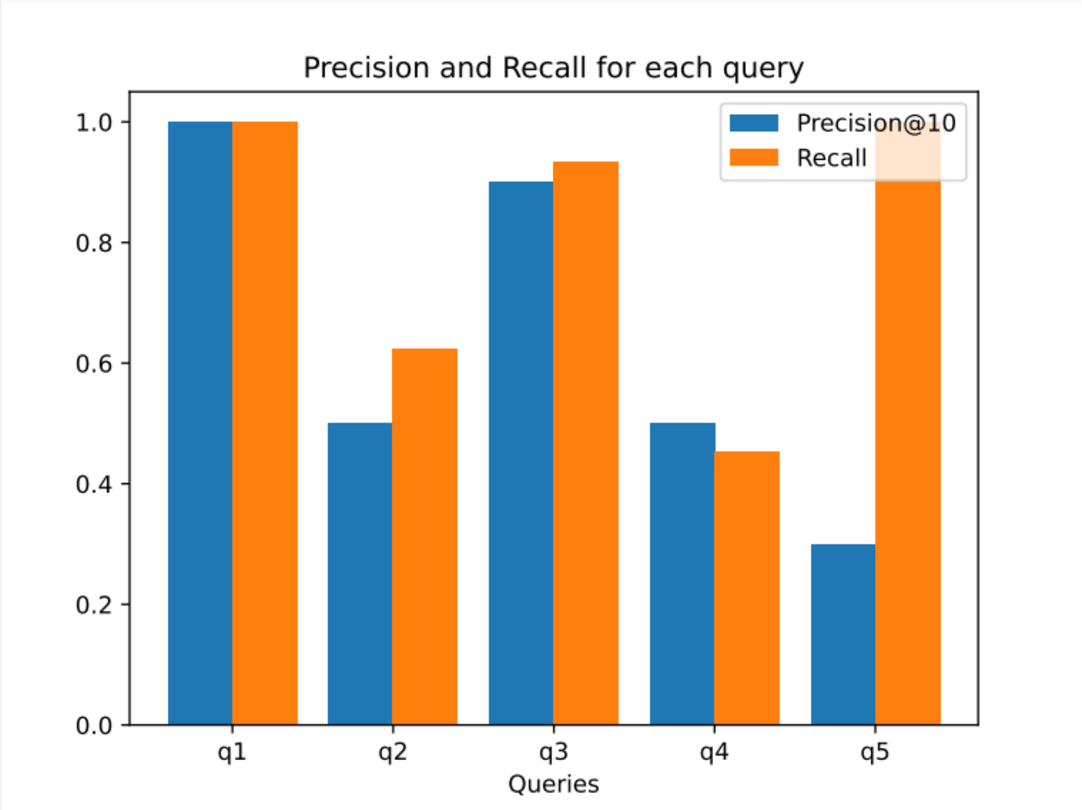
	Non-boosted	Boosted
Precision	0.3	0.9
Recalls	1.0	1.0

Overall results

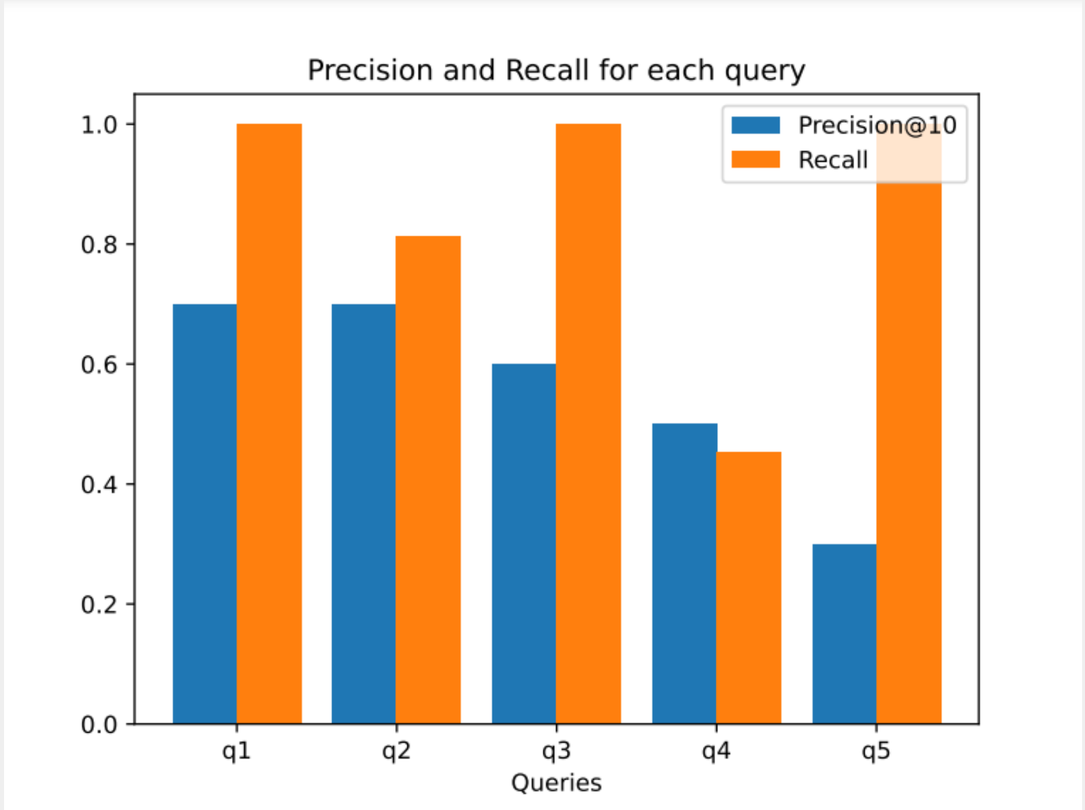
	Non-boosted	Boosted
Average Precision	0.6399	0.9
Average Recalls	0.8026	0.97417

Overall results - non-boosted

Best schema

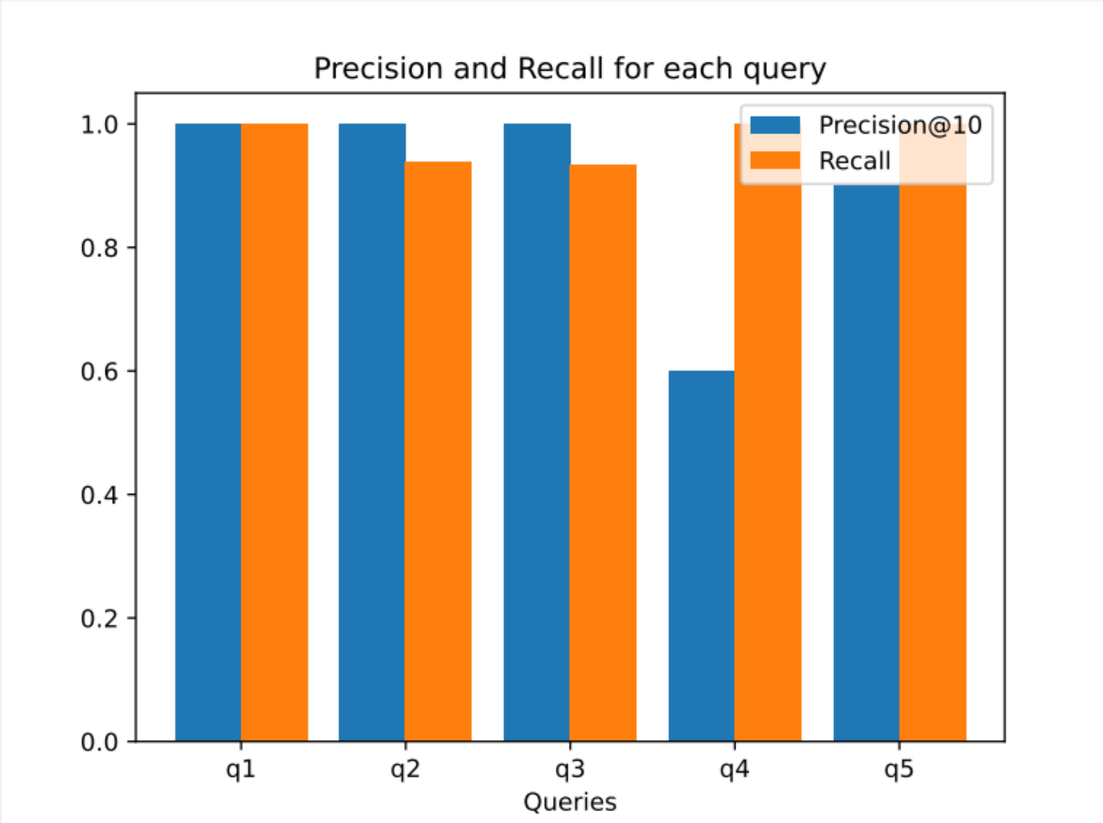


Worst schema

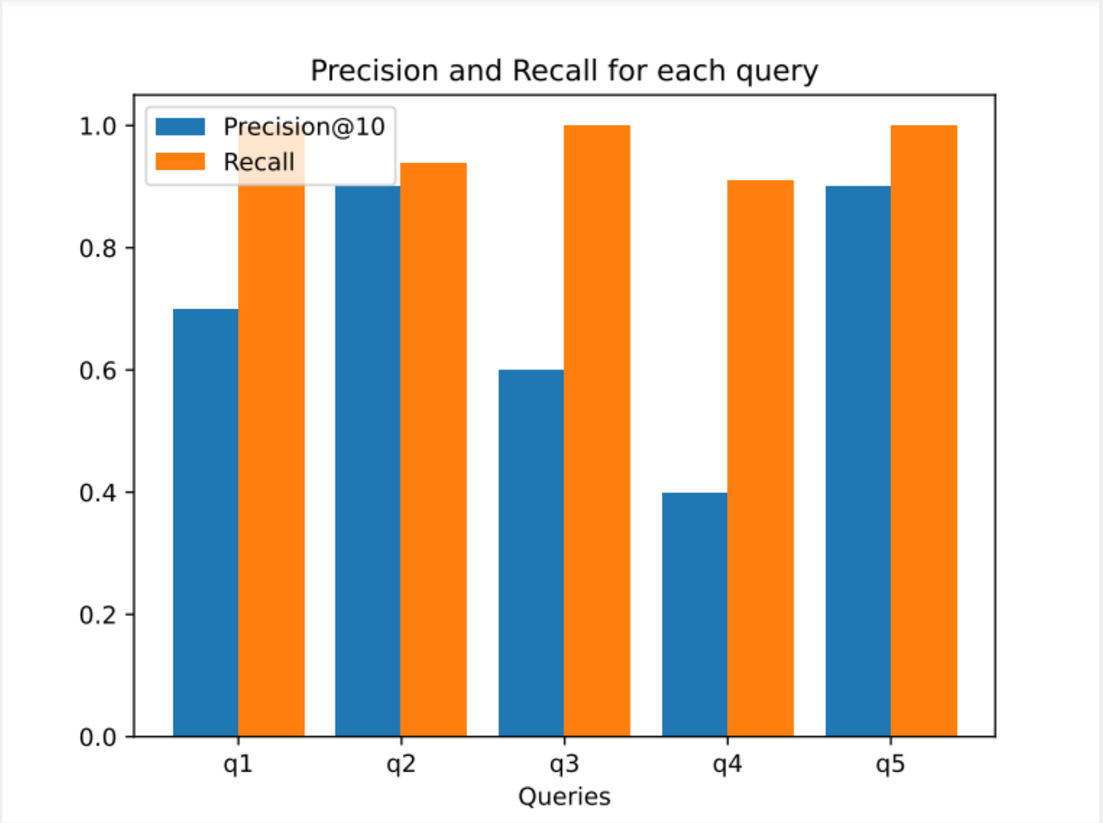


Overall results - boosted

Best schema



Worst schema



Questions?