Visualizing Information Retrieval Study Results for RAT

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RAT
RESULT ASSESSMENT TOOL

UNIVERSITÄT DUISBURG ESSEN

Offen im Denken

Introduction

To retrieve a desired information from the web, the user utilizes a search engine, where the results are returned, listed in a specific order or each result has a specific rank. But the question is, ***which search engine to use?*** According to the statistics from StatCounter (2024), ***Google is the most used search engine*** with the highest market share in the world, ***so should people use Google?*** Does Google provide the users with the best possible results? If yes, then how precise are the set of results? If no, then how would one compare Google with other search engines like Yahoo! or Bing? Moreover, how can one assess that a developed information retrieval system is efficient? If a search engine provides information faster than its contemporaries, does it also mean this search engine returns the best possible results?

Evaluation of information retrieval systems, in this case, search engines is important to answer the questions outlined above.

Research Questions

1. What are the measures available in evaluation of information retrieval systems?
2. Which of the measures can be implemented in Python based on the sample dataset of RAT case studies from past (Lewandowski, 2014)?
3. Which measures can provide some valuable insights to the project administrators?

Objectives

i. Project administrators should be able to upload the RAT results in form of a csv file for analysis.

ii. A list of measures is provided for selection and visualizations are displayed accordingly.

iii. Each of the displayed visualizations could be downloaded individually for further use.

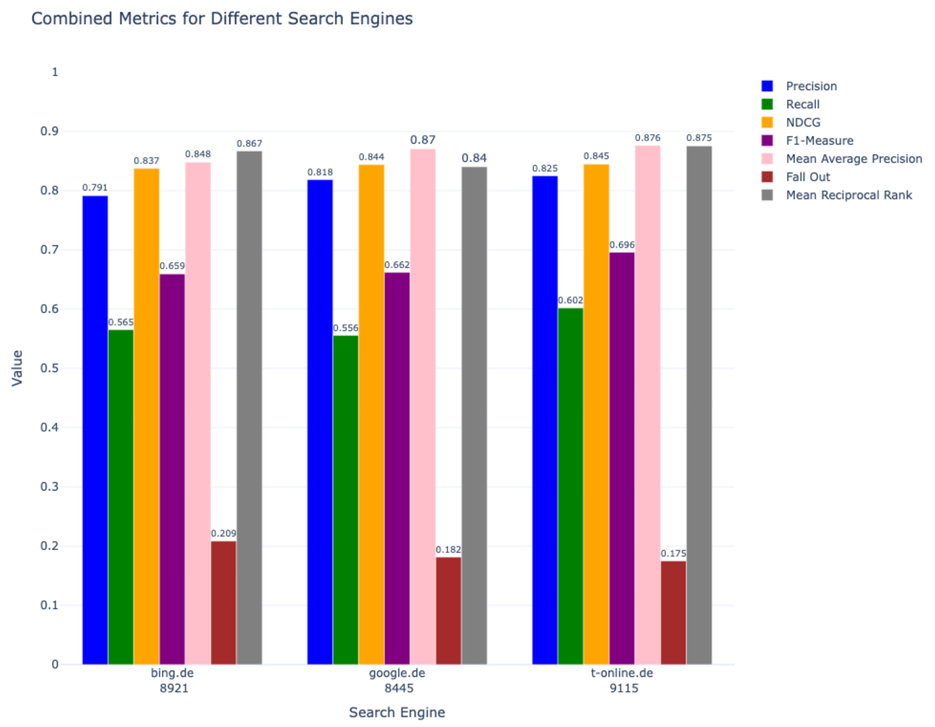
IR Measures
Precision
Recall
Precision @k
Recall @k
NDCG
NDCG @k
Interpolated Precision
F1Measure
Mean Average Precision
Mean Reciprocal Rank
Fallout

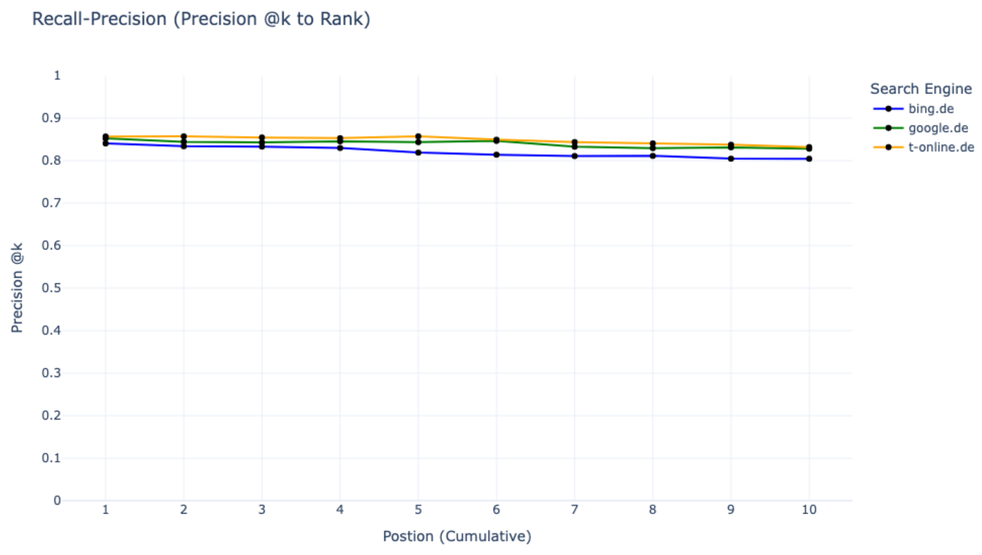
Implementation

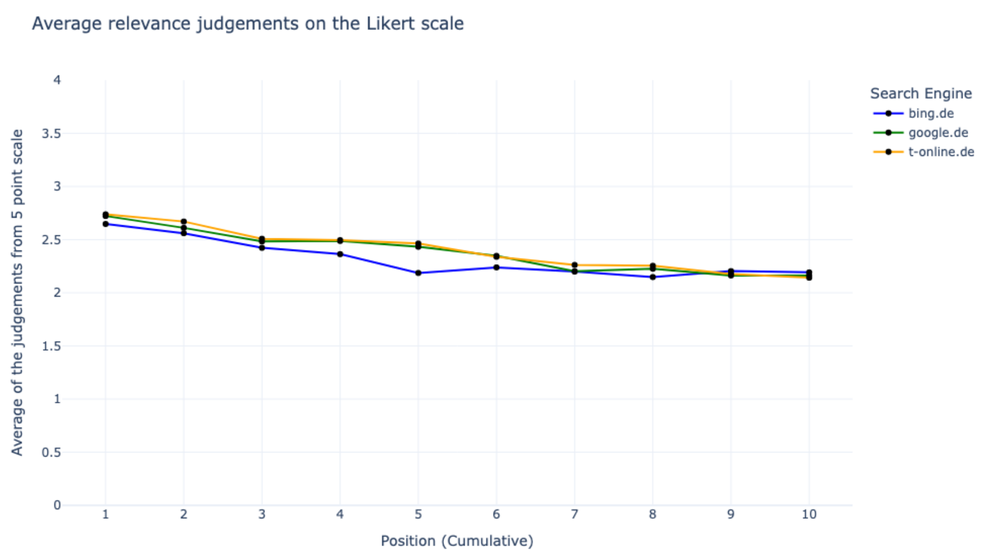
References

- Manning, C. D., Raghavan, P., & Schütze, H. (2008). *Introduction to information retrieval*. Cambridge University Press.
- StatCounter. (2024). *Search Engine Market Share Worldwide*. StatCounter Global Stats. https://gs.statcounter.com/search-engine-market-share
- Lewandowski, D. (2014). Evaluating the Retrieval Effectiveness of Web Search Engines Using a Representative Query Sample. *Journal of the Association for Information Science and Technology*, *66*. https://doi.org/10.1002/asi.23304

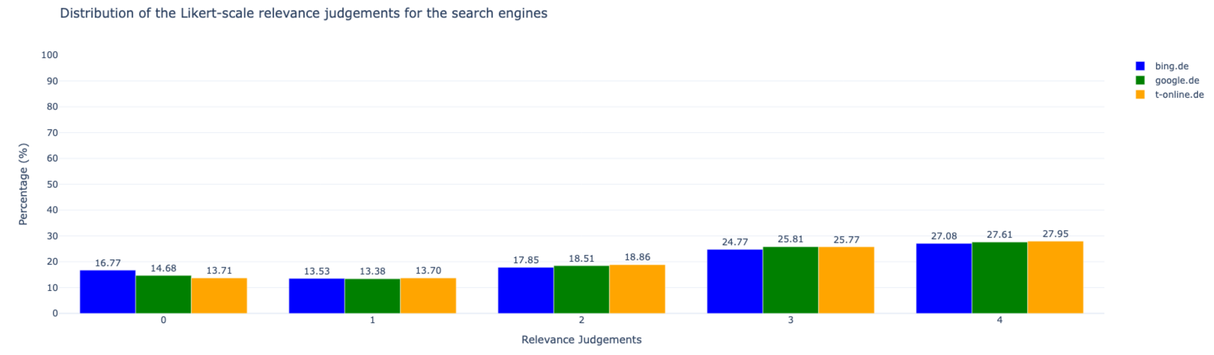
Some Visualizations







Distribution of the Likert-scale relevance judgements for the search engines



Distribution of the Binary relevance judgements for search engines