Arun Nekkalapudi [anekkal]

**Short query**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Evaluation Metric | Your algorithm | Vector Space Model | BM25 | Language model with Dirichlet Smoothing | Language Model with Jelinek Mercer Smoothing |
| P@5 | 0.2000 | 0.4000 | 0.6000 | 0.6000 | 0.4000 |
| P@10 | 0.1000 | 0.5000 | 0.5000 | 0.5000 | 0.5000 |
| P@20 | 0.1000 | 0.4000 | 0.3000 | 0.4000 | 0.2500 |
| P@100 | 0.0600 | 0.0900 | 0.1000 | 0.0900 | 0.1000 |
| Recall@5 | 0.0323 | 0.0645 | 0.0968 | 0.0968 | 0.0645 |
| Recall@10 | 0.0323 | 0.1613 | 0.1613 | 0.1613 | 0.1613 |
| Recall@20 | 0.0645 | 0.2581 | 0.1935 | 0.2258 | 0.1613 |
| Recall@100 | 0.1935 | 0.2903 | 0.3226 | 0.2903 | 0.3226 |
| MAP | 0.0634 | 0.1833 | 0.1894 | 0.1404 | 0.1462 |
| MRR | 1.0000 | 1.0000 | 1.0000 | 0.5000 | 1.0000 |
| NDCG@5 | 0.3392 | 0.5531 | 0.7227 | 0.4913 | 0.5531 |
| NDCG@10 | 0.2201 | 0.5801 | 0.6208 | 0.4666 | 0.5704 |
| NDCG@20 | 0.1793 | 0.4786 | 0.4341 | 0.4054 | 0.3681 |
| NDCG@100 | 0.2112 | 0.3804 | 0.4036 | 0.3180 | 0.3726 |

**Long Query**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Evaluation Metric | Your algorithm | Vector Space Model | BM25 | Language model with Dirichlet Smoothing | Language Model with Jelinek Mercer Smoothing |
| P@5 | 0.0000 | 0.2000 | 0.6000 | 0.0000 | 0.2000 |
| P@10 | 0.0000 | 0.3000 | 0.3000 | 0.2000 | 0.3000 |
| P@20 | 0.1500 | 0.2500 | 0.3000 | 0.2500 | 0.2500 |
| P@100 | 0.0400 | 0.0400 | 0.1000 | 0.1000 | 0.0900 |
| Recall@5 | 0.0000 | 0.0323 | 0.0968 | 0.0000 | 0.0323 |
| Recall@10 | 0.0000 | 0.0968 | 0.0968 | 0.0645 | 0.0968 |
| Recall@20 | 0.0968 | 0.1613 | 0.1935 | 0.1613 | 0.1613 |
| Recall@100 | 0.1290 | 0.3226 | 0.3226 | 0.3226 | 0.2905 |
| MAP | 0.0211 | 0.1074 | 0.1333 | 0.0693 | 0.0853 |
| MRR | 0.0833 | 0.5000 | 1.0000 | 0.1250 | 0.2000 |
| NDCG@5 | 0.0000 | 0.2140 | 0.6399 | 0.0000 | 0.1312 |
| NDCG@10 | 0.0000 | 0.2785 | 0.4153 | 0.1357 | 0.2312 |
| NDCG@20 | 0.1066 | 0.2545 | 0.3732 | 0.1924 | 0.2259 |
| NDCG@100 | 0.0982 | 0.2881 | 0.3519 | 0.2399 | 0.2478 |

#### **Summary:**

After evaluating the precision, Recall, MAP, MRR, NDCG I found that BM25 [TF\*IDF model] performs betters in most of the scenarios both in long query and short query. It got the right balance of most of the things especially in precision and recall.

Though the Language models (Dirichlet Smoothing and Jelinek Mercer Smoothing) tend to perform better for short queries they fail to perform better under long queries (The lower precision and call rates). but for Longer Queries Jelinek Mercer Smoothing language model is performing better than the Dirichlet Smoothing.

TF\*IDF models have the higher NDCG when compare Language models.

MRR is very low in our algorithm and between TF\*IDF and Dirichlet smoothing language model has the lowest MRR in long query as well as short query.

Submission: Please submit the java codes and results via Canvas.