

ASSIGNMENT 2

Short Query:

Evaluation Metric	Your Algorithm	Vector Space Model	BM25	Language Model with Dirichlet Smoothing	Language Model with Jelinek Mercer Smoothing
P@5	0.0800	0.2920	0.3040	0.3480	0.2840
P@10	0.0940	0.3020	0.3000	0.3300	0.2820
P@20	0.0870	0.2640	0.2700	0.2890	0.2470
P@100	0.0618	0.1642	0.1674	0.1690	0.1600
Recall@5	0.0141	0.0529	0.0478	0.0621	0.0524
Recall@10	0.0382	0.0961	0.0879	0.1018	0.0913
Recall@20	0.0592	0.1451	0.1377	0.1460	0.1337
Recall@100	0.1563	0.3556	0.3557	0.3452	0.3300
MAP	0.0603	0.1990	0.2011	0.2072	0.1942
MRR	0.1628	0.4798	0.4778	0.4786	0.4542
NDCG@5	0.0815	0.3107	0.3212	0.3520	0.3015
NDCG@10	0.0942	0.3194	0.3196	0.3448	0.3010
NDCG@20	0.0975	0.3081	0.3115	0.3329	0.2910
NDCG@100	0.1228	0.3215	0.3251	0.3309	0.3108

Long Query:

Evaluation Metric	Your Algorithm	Vector Space Model	BM25	Language Model with Dirichlet Smoothing	Language Model with Jelinek Mercer Smoothing
P@5	0.1120	0.2560	0.2840	0.2560	0.2320
P@10	0.0980	0.2440	0.2440	0.2420	0.2140
P@20	0.0900	0.2210	0.2340	0.2340	0.2120

P@100	0.0602	0.1406	0.1488	0.1460	0.1378
Recall@5	0.0148	0.0349	0.0402	0.0403	0.0406
Recall@10	0.0249	0.0621	0.0703	0.0708	0.0658
Recall@20	0.0422	0.1064	0.1159	0.1270	0.1136
Recall@100	0.1458	0.2929	0.3167	0.3340	0.2901
MAP	0.0526	0.1529	0.1676	0.1586	0.1514
MRR	0.1748	0.4528	0.4597	0.3475	0.3640
NDCG@5	0.1092	0.2819	0.3029	0.2499	0.2348
NDCG@10	0.1005	0.2682	0.2729	0.2473	0.2294
NDCG@20	0.0993	0.2586	0.2718	0.2590	0.2410
NDCG@100	0.1181	0.2694	0.2872	0.2753	0.2609

We see that the performance is better for longer queries except for TF-IDF.
With TF-IDF, we see that the recall gets better with longer queries.

Another observation that I made is that precision decreases with the number and recall increases.

The Mean Average Precision in short query type is best of LM Dirichlet and for long query type it is best for BM25. However, the performance of both is comparable.

The Mean Reciprocal Rank is an alternative metric for MAP and in short query type is best of LM Dirichlet and for long query type it is best for BM25. However, the performance of both is comparable.

We see that the performance of the various models, keeps increasing in the order I have written the table, except for LM with Jelinek Mercer Smoothing. Its performance is comparable to the Vector Space Model for shorter queries.

For longer queries, performance of LM with Dirichlet Smoothing gives comparable performance to the Vector Space Model.

NDCG is normalized discounted cumulative gain, it measures effectiveness. The best performance is given by LM with Jelinek Mercer Smoothing.