SCORE REPORT

INFORMATION RETRIEVAL

ASSIGNMENT # 2

# SCORE TABLE

|  |  |  |
| --- | --- | --- |
| TF Scores | 202 | 0.0 |
|  | 214 | 0.4103140763267171 |
|  | 216 | 0.3444326515452093 |
|  | 221 | 0.34806719022696564 |
|  | 227 | 0.06810145227682243 |
|  | 230 | 0.15851341756512208 |
|  | 234 | 0.41390072214953744 |
|  | 243 | 0.29882793273534186 |
|  | 246 | 0.1196812525974099 |
|  | 250 | 0.01840284074820255 |
|  | Avg | 0.21802415361713287 |

|  |  |
| --- | --- |
| Query | Score |

|  |  |  |
| --- | --- | --- |
| TF-IDF | 202 | 0.0 |
|  | 214 | 0.43983570681388967 |
|  | 216 | 0.3584303955388199 |
|  | 221 | 0.33146057619667446 |
|  | 227 | 0.06954024467366611 |
|  | 230 | 0.18519230760824837 |
|  | 234 | 0.4274815061949275 |
|  | 243 | 0.27998906802682094 |
|  | 246 | 0.1232558916932528 |
|  | 250 | 0.02337393629631471 |
|  | Avg | 0.22385596330426147 |
| BM25 | 202 | 0.0 |
|  | 214 | 0.5472336230459914 |
|  | 216 | 0.4779263845212727 |
|  | 221 | 0.3738197451256454 |
|  | 227 | 0.21875689535308054 |
|  | 230 | 0.3563819001264153 |
|  | 234 | 0.6415632936438538 |
|  | 243 | 0.3201771942624003 |
|  | 246 | 0.1481816491957189 |
|  | 250 | 0.10618521546915802 |
|  | avg | 0.3190225890629763 |

|  |  |  |
| --- | --- | --- |
| JM | 202 | 0.0 |
|  | 214 | 0.5341437208676446 |
|  | 216 | 0.4294449881686841 |
|  | 221 | 0.34255224066153 |
|  | 227 | 0.14966966145744265 |
|  | 230 | 0.2568956482705933 |
|  | 234 | 0.6072051329279208 |
|  | 243 | 0.30647341225591607 |
|  | 246 | 0.19030582745862082 |
|  | 250 | 0.038632952250680294 |
|  | avg | 0.2855323584319033 |

# BEST PERORMING METHOD

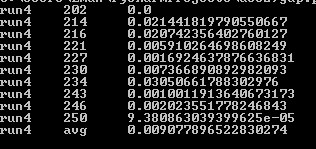
The above table illustrates that BM25 has best average among all other scoring functions.

**BM25 Performance:**

We kept the value of b=0.75 and k1=1.2 and changed k2 between 1 and 100. We found that k2 has no impact on the score AT ALL. Since the query are small. One term occurs one time so we are essentially doing a 1+k2/k2 which is always 1.001.

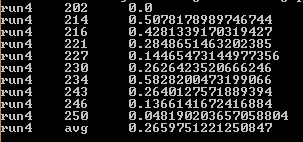
# Jelinek Mercer Smoothing Performance

After changing lambda value to 0 in Jelenik model the average score has reduced to 0.009 as shown in figure below:



It shows that changing lambda to 0 we are considering probability of model trained only on documents in background. This isn’t good at all.

By changing lambda value to 1 i-e considering only relevant documents *d* we got average score of 0.26 as shown in figure below:



Hence it is giving best results on lambda = 0.6 as preferred in assignment.

# Okapi TF , IDF performances:

Average scores for okapi TFIDf, okapi TF and Jelinek are quite similar because it depends on terms that how often they appear or does not appear in relevant and non-relevant document. Moreover, TF methods take into account that how many times a term occurred in a document. And TFIDF considers the weightage of each term with respect to all documents. Since, TFIDF gives more importance to unique words and less importance to common ones. Results showed that TFIDF resulted slightly better than TF.

# EXPECTATIONS

Before implementing rankers, we thought Jelinek Mercer smoothing would outperform all other scoring functions because it takes into account all background documents as well. If term doesn’t appear in document it is not necessary that document is completely irrelevant. So for giving non-zero weightage to that term we take background documents score into account as well. Hence it seemed that Jelinek would be the best of all other methods. All other methods are not considering background documents (probability of all documents) for a particular term.

# COMPARISON OF RESULT WITH EXPECTATIONS

But after analyzing all scoring functions results, BM25 was in leadwith average of **0.319 . Jelinek didn’t performed best because it is suitable for larger documents and long queries**. And BM25 gives quite good score for short queries. In our case we have short or titled queries so that’s why BM25 performed comparatively better than other scoring methods.

# DIFFICULT QUERY:

The query that performed badly is query 202. Why? It says “chocolate carl Vinson” its description says “Find the home page of the USS Carl Vinson (CVN70) carrier.” But! The query is mistyped and chocolate IS INCLUDED IN IT!!!