We have multiple relavenace measures to determine whether a document is relevant or not.
We can use **LMJM** and DFR to calculate score of the documents in our corpus

Query = Halifax explosion

Below are results in trec eval format from DFR and LMJM

vigy@Vigneshs-MacBook-Pro code % python3 QueryProgram.py my_corpus_1.txt "halifax explosion" DFR
1 0 7 1 0.24944012687112654 DFR
1 0 9 2 0.24944012687112654 DFR
1 0 11 3 0.2462808755877967 DFR
1 0 5 4 0.2456327477391898 DFR
1 0 10 5 0.24421880899346207 DFR
1 0 3 6 0.24256864199393174 DFR
1 0 1 7 0.24244262955669588 DFR
1 0 2 8 0.2409406323662104 DFR
1 0 4 9 0.24081630582293934 DFR
1 0 6 10 0.2373865286549363 DFR
1 0 8 11 0.08017109122459541 DFR

vigy@Vigneshs-MacBook-Pro code % python3 QueryProgram.py my_corpus_1.txt "halifax explosion" LMJM
1 0 6 1 74.84100201578056 LMJM
1 0 4 2 72.58981524929995 LMJM
1 0 3 3 72.43998884819356 LMJM
1 0 2 4 70.72260155971225 LMJM
1 0 1 5 68.89549469364628 LMJM
1 0 5 6 68.5943442873523 LMJM
1 0 10 7 66.92482993580322 LMJM
1 0 7 8 66.73479026956335 LMJM
1 0 11 9 66.13212226896721 LMJM
1 0 9 10 64.53756582622665 LMJM
1 0 8 11 32.813971337101044 LMJM

Using trec eval tool and comparing results from both:
Trec eval for query 1 for DFR

```
[vigy@Vigneshs-MacBook-Pro files % trec_eval trec_rel_query_1.txt trec_rel_top_DFR_query_1.txt
runid                   all     DFR
num_q                   all     1
num_ret                 all     11
num_rel                 all     10
num_rel_ret             all     10
map                     all     1.0000
gm_map                  all     1.0000
Rprec                   all     1.0000
bpref                   all     1.0000
recip_rank              all     1.0000
iprec_at_recall_0.00    all     1.0000
iprec_at_recall_0.10    all     1.0000
iprec_at_recall_0.20    all     1.0000
iprec_at_recall_0.30    all     1.0000
iprec_at_recall_0.40    all     1.0000
iprec_at_recall_0.50    all     1.0000
iprec_at_recall_0.60    all     1.0000
iprec_at_recall_0.70    all     1.0000
iprec_at_recall_0.80    all     1.0000
iprec_at_recall_0.90    all     1.0000
iprec_at_recall_1.00    all     1.0000
P_5                     all     1.0000
P_10                    all     1.0000
P_15                    all     0.6667
P_20                    all     0.5000
P_30                    all     0.3333
P_100                   all     0.1000
P_200                   all     0.0500
P_500                   all     0.0200
P_1000                  all     0.0100
```

Trec eval for query 1 for LMJM

```
[vigy@Vigneshs-MacBook-Pro files % trec_eval trec_rel_query_1.txt trec_rel_top_LMJM_query_1.txt
runid                   all     LMJM
num_q                   all     1
num_ret                 all     11
num_rel                 all     10
num_rel_ret             all     10
map                     all     1.0000
gm_map                  all     1.0000
Rprec                   all     1.0000
bpref                   all     1.0000
recip_rank              all     1.0000
iprec_at_recall_0.00    all     1.0000
iprec_at_recall_0.10    all     1.0000
iprec_at_recall_0.20    all     1.0000
iprec_at_recall_0.30    all     1.0000
iprec_at_recall_0.40    all     1.0000
iprec_at_recall_0.50    all     1.0000
iprec_at_recall_0.60    all     1.0000
iprec_at_recall_0.70    all     1.0000
iprec_at_recall_0.80    all     1.0000
iprec_at_recall_0.90    all     1.0000
iprec_at_recall_1.00    all     1.0000
P_5                     all     1.0000
P_10                    all     1.0000
P_15                    all     0.6667
P_20                    all     0.5000
P_30                    all     0.3333
P_100                   all     0.1000
P_200                   all     0.0500
P_500                   all     0.0200
P_1000                  all     0.0100
```

Query = huge casualties

vigy@Vigneshs-MacBook-Pro code % python3 QueryProgram.py my_corpus_1.txt "huge casualties" DFR
1 0 8 1 1.5696151079271115 DFR
1 0 5 2 1.5240334537782334 DFR
1 0 4 3 1.4197661447188794 DFR
1 0 3 4 0.6127531616325455 DFR
1 0 2 5 0.6004998121550662 DFR

vigy@Vigneshs-MacBook-Pro code % python3 QueryProgram.py my_corpus_1.txt "huge casualties" LMJM
1 0 4 1 61.71365738639936 LMJM
1 0 5 2 60.12613232513636 LMJM
1 0 8 3 59.27183621205735 LMJM
1 0 2 4 31.244977597284617 LMJM
1 0 3 5 31.005059008968665 LMJM

Using trec eval tool and comparing results from both:

Trec eval for query 2 for DFR

```
vigy@Vigneshs-MacBook-Pro files % trec_eval trec_rel_query_2.txt trec_rel_top_DFR_query_2.txt
runid                   all     DFR
num_q                   all     1
num_ret                 all     5
num_rel                 all     6
num_rel_ret             all     5
map                     all     0.8333
gm_map                  all     0.8333
Rprec                   all     0.8333
bpref                   all     0.8333
recip_rank              all     1.0000
iprec_at_recall_0.00    all     1.0000
iprec_at_recall_0.10    all     1.0000
iprec_at_recall_0.20    all     1.0000
iprec_at_recall_0.30    all     1.0000
iprec_at_recall_0.40    all     1.0000
iprec_at_recall_0.50    all     1.0000
iprec_at_recall_0.60    all     1.0000
iprec_at_recall_0.70    all     1.0000
iprec_at_recall_0.80    all     1.0000
iprec_at_recall_0.90    all     0.0000
iprec_at_recall_1.00    all     0.0000
P_5                     all     1.0000
P_10                    all     0.5000
P_15                    all     0.3333
P_20                    all     0.2500
P_30                    all     0.1667
P_100                   all     0.0500
P_200                   all     0.0250
P_500                   all     0.0100
P_1000                  all     0.0050
```

Trec eval for query 2 for LMJM

```
[vigy@Vigneshs-MacBook-Pro files % trec_eval trec_rel_query_2.txt trec_rel_top_LMJM_query_2.txt
runid                   all     LMJM
num_q                   all     1
num_ret                 all     5
num_rel                 all     6
num_rel_ret             all     5
map                     all     0.8333
gm_map                  all     0.8333
Rprec                   all     0.8333
bpref                   all     0.8333
recip_rank              all     1.0000
iprec_at_recall_0.00    all     1.0000
iprec_at_recall_0.10    all     1.0000
iprec_at_recall_0.20    all     1.0000
iprec_at_recall_0.30    all     1.0000
iprec_at_recall_0.40    all     1.0000
iprec_at_recall_0.50    all     1.0000
iprec_at_recall_0.60    all     1.0000
iprec_at_recall_0.70    all     1.0000
iprec_at_recall_0.80    all     1.0000
iprec_at_recall_0.90    all     0.0000
iprec_at_recall_1.00    all     0.0000
P_5                     all     1.0000
P_10                    all     0.5000
P_15                    all     0.3333
P_20                    all     0.2500
P_30                    all     0.1667
P_100                   all     0.0500
P_200                   all     0.0250
P_500                   all     0.0100
P_1000                  all     0.0050
```

Because the dataset was small, the DFR and LMJM relevance calculation measure are relatively same.