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National University of Computer & Emerging Sciences
FAST-Karachi Campus
CS4051- Information Retrieval
Quiz#2

Dated: March 14, 2023 Marks: 20
Time: 20 min.
Std-ID: _____Sol_____

Question No. 1

Assume there are 16 total relevant documents in a collection. Consider the following result against a query that return 10 documents in the given order., where plus indicates relevant and minus indicates non-relevant:

{+, +, −, +, +, −, −, +, −, −}

Calculate the following evaluation measures on the ranked list.? **[2.5 x 4]**

a. What is the Precision?

Precision = # relevant retrieved / total retrieved = 5/10 = 0.5

b. What is the Recall?

Recall = # relevant retrieved / total relevant = 5/16 = 0.312

c. What is the F1 Score?

F1= (2 *P*R)/ (P+R) = (2*0.5*0.312)/(0.5+0.312)= 0.312/0.812= 0.384

d. What is Average Precision?

AP = (1+1+ 3/4+4/5+5/8) / 5 = 4.175 / 5 = 0.835

Question No. 2

Differentiate between the following pairs of terms [2.5 X 2]

Unranked Retrieval	**Ranked Retrieval**
- Flat results and all documents are equally ranked (Boolean Model) - Not very intuitive and easy as user has to sift through all results. - Set Oriented evaluation metrics, generally very hard to understand	- Ranked results, most relevant at the top of the list - Easy as user has to only view top results - Different evaluation metrics, generally maintains ranking criteria in them
Static Snippet Summary	**Dynamic Snippet Summary**
- First few hundred bytes of the documents (Fixed/Static) - Independent of query - May not be very useful for the users. - Fast processing and retrieval	- Produced by summary algorithms like: (KWIC –summary) - Very much query dependent - Users like these dynamic summaries more. - Slow to process and retrieval

Question No. 3

Explain what is Normalized Discount Cumulative Gain (NDCG). Give at least 2 of its limitations. [5]

Normalized Discount Cumulative Gain (NDCG) - It is measure of ranking quality that is often used to measure effectiveness of IR Systems that produced ranked results or web search engine.

Limitations:

NDCG metrics do not penalize the bad documents outputs.

NDCG does not handle any missing relevant document in the output as there is no specific standard defined for the number of output documents.

Normalized DCG may not be suitable to measure the performance of queries that may often have several equally good results.