INFORMATION RETRIEVAL

HOMEWORK EXERCISES L02. EVALUATION

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EXERCISE 1

- The following list of Rs and Ns represent relevant (R) and nonrelevant (N) returned documents in a ranked list of 20 documents retrieved in response to a query from a collection of 10,000 documents. The top of the ranked list is on the left of the list. This list shows 6 relevant documents. Assume there are 8 relevant documents in total in the collection.

  R R N N N N N N R N R N N N R N N N N R

- Calculate (show your calculations):
  a. Precision
  b. Recall
  c. F1

EXERCISE 1 - SOLUTION

- The following list of Rs and Ns represent relevant (R) and nonrelevant (N) returned documents in a ranked list of 20 documents retrieved in response to a query from a collection of 10,000 documents. The top of the ranked list is on the left of the list. This list shows 6 relevant documents. Assume there are 8 relevant documents in total in the collection.

  R R N N N N N N R N R N N N R N N N N R

- Calculate (show your calculations):
  a. Precision = 6/20 = 0.3
  b. Recall = 6/8 = 0.75
  c. F1 = 2*(0.3*0.75)/(0.3+0.75) ≈ 0.43

EXERCISE 2

R R N N N N N N R N R N N N R N N N N R

- Given this same result list and the known number of relevant documents in the collection, calculate (show your calculation) the Average Precision

EXERCISE 2

R R N N N N N N R N R N N N R N N N N R

- Given this same result list and the known number of relevant documents in the collection, calculate (show your calculation) the Average Precision

- AP = (1/1+2/2+3/9+4/11+5/15+6/20) / 8 ≈ 0.42

EXERCISE 3

R R N N N N N N R N R N N N R N N N N R

- Given this same result list, draw the Precision-Recall graph

EXERCISE 3

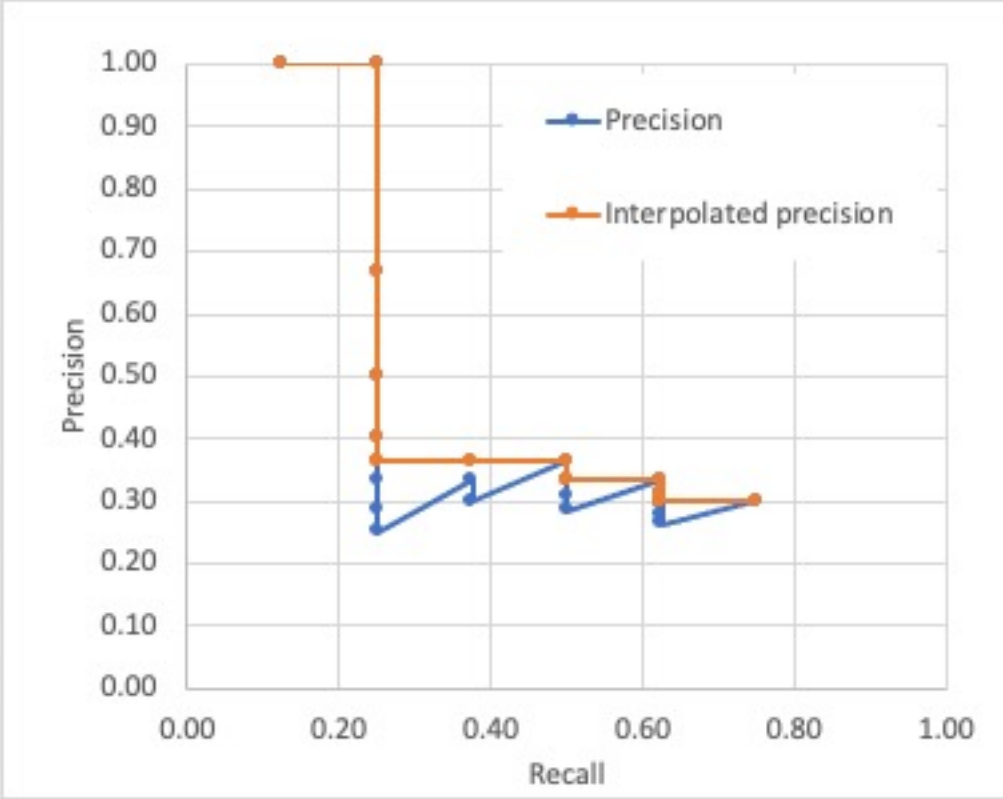
R R N N N N N N R N R N N N R N N N N R

- Given this same result list, draw the Precision-Recall graph
- IIR, section 8.4
- the interpolated precision p_{interp} at a certain recall level r is defined as the highest precision found for any recall level $r' \geq r$:

$$p_{interp}(r) = \max_{r' \geq r} p(r')$$

EXERCISE 3

	Precision	Recall	Precision	Recall	Interpolated precision
1	1/1	1/8	1.000	0.125	1.000
2	2/2	2/8	1.000	0.250	1.000
3	2/3	2/8	0.667	0.250	0.667
4	2/4	2/8	0.500	0.250	0.500
5	2/5	2/8	0.400	0.250	0.400
6	2/6	2/8	0.333	0.250	0.364
7	2/7	2/8	0.286	0.250	0.364
8	2/8	2/8	0.250	0.250	0.364
9	3/9	3/8	0.333	0.375	0.364
10	3/10	3/8	0.300	0.375	0.364
11	4/11	4/8	0.364	0.500	0.364
12	4/12	4/8	0.333	0.500	0.333
13	4/13	4/8	0.308	0.500	0.333
14	4/14	4/8	0.286	0.500	0.333
15	5/15	5/8	0.333	0.625	0.333
16	5/16	5/8	0.313	0.625	0.313
17	5/17	5/8	0.294	0.625	0.300
18	5/18	5/8	0.278	0.625	0.300
19	5/19	5/8	0.263	0.625	0.300
20	6/20	6/8	0.300	0.750	0.300



EXERCISE 4

R R N N N N N N R N R N N N R N N N N R

- Assume that the gain for a relevant document (R) is 1 and for a non-relevant document (N) is 0.
- Calculate (show your calculations):
  a. CG@20
  b. DCG@20
  c. nDCG@20

EXERCISE 4

R R N N N N N N R N R N N N R N N N N R

- Assume that the gain for a relevant document (R) is 1 and for a non-relevant document (N) is 0.
- Calculate (show your calculations):
  a. CG@20 = 6
  b. DCG@20 = $1+1/\log_2(2)+1/\log_2(9)+1/\log_2(11)+1/\log_2(15)+1/\log_2(20) \approx 3.1$
  c. nDCG@20 = DCG/iDCG
     iDCG = $1+1/\log_2(2)+1/\log_2(3)+1/\log_2(4)+1/\log_2(5)+1/\log_2(6)+1/\log_2(7)+1/\log_2(8) \approx 4.6$
     nDCG@20 ≈ $3.1/4.6 \approx 0.67$