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| HW5 - Evaluation |
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| PB15111604金泽文 |

[**Web Information Processing and Applications**](http://staff.ustc.edu.cn/~jpq/courses/webinfo.html)

HW5 - Evaluation

PB15111604金泽文

1. 假设现在有2个检索系统S1和S2，它们在文档集上分别执行查询Q1和Q2，均返回了5个结果，如下表所示：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 系统&查询 | 1 | 2 | 3 | 4 | 5 |
| S1，Q1 | d3 | d5 | d8 | d10 | d11 |
| S1，Q2 | d1 | d2 | d7 | d11 | d13 |
| S2，Q1 | d6 | d7 | d2 | d9 | d8 |
| S1，Q2 | d1 | d2 | d4 | d11 | d12 |

设Q1的相关文档为｛d5，d6，d7，d8｝，Q2的相关文档为｛d1，d2，d11，d12，d13｝  
分别计算S1和S2对于查询Q1和Q2的正确率P、召回率R、F1值、P@4和平均正确率AP，并计算S1和S2在所有查询上的MAP值

解答：

S1对于Q1:

p = 2/5

R = 2/4 = 1/2

F1 = 4/9

P@4 = 2/4 = 1/2

AP = (1/2 + 2/3 + 0 + 0) / 4 = 7/24

S1对于Q2:

p = 4/5

R = 4/5

F1 = 4/5

P@4 = 3/4

AP = (1/1 + 2/2 + 3/4 + 4/5 + 0) / 5 = 71/100

S2对于Q1:

p = 3/5

R = 3/4

F1 = 2/3

P@4 = 2/4 = 1/2

AP = (1/1 + 2/2 + 3/5 + 0) / 4 = 13/20

S2对于Q2:

p = 4/5

R = 4/5

F1 = 4/5

P@4 = 3/4

AP = (1/1 + 2/2 + 3/4 + 4/5 + 0) / 5 = 71/100

S1和S2的MAP:

MAP\_S1 = (7/24 + 71/100) / 2 = 601/1200

MAP\_S2 = (13/20 + 71/100) / 2 = 17/25

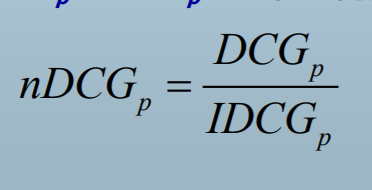
得表：

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 系统 | 查询 | P | R | F1 | [P@4](mailto:P@4) | AP | MAP |
| **S1** | **Q1** | **2/5** | **1/2** | **4/9** | **1/2** | **7/24** | **0.501** |
| **Q2** | **4/5** | **4/5** | **4/5** | **3/4** | **71/100** |
| **S2** | **Q1** | **3/5** | **3/4** | **2/3** | **1/2** | **13/20** | **0.680** |
| **Q2** | **4/5** | **4/5** | **4/5** | **3/4** | **71/100** |

1. 假设某个检索系统对查询A返回了6个文档，相关度为0-3之间的整数值（3最高，0最低），每个文档与查询的相关度如下所示，请计算查询A的NDCG6值，要求给出计算步骤。

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 文档 | 1 | 2 | 3 | 4 | 5 | 6 |
| 相关度（0-3） | 3 | 1 | 3 | 0 | 1 | 2 |

解答：

由

计算DCG6：

rel1=3， Discounted Gain：

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **5** | **6** |
| **1** | **3/1.58** | **0** | **1/2.3** | **2/2.58** |

DCG＝3＋Σdiscounted gain=3+4.11=7.11

计算IDCG6：

理想的输出序列：3,3,2,1,1,0，

同上得到IDCG6 =3＋Σdiscounted gain

=3+（3+2/1.58+1/2+1/2.32）

=8.20

所以，nDCG6=7.11/8.20=0.87